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# Altered video task in 15-month-olds

## how to bridge the gap between Tulving's definition and current methods?

Bobrowicz, Katarzyna; Haman, Maciej; Bobrowicz, Ryszard

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PO Box 117
221 00 Lund
+46 46-222 00 00

# Keynote session I

**K1 session**

Sunday, 17 July 2016 | 17:15 - 18:15 | Room 1

**Chair/Organizer: Martin A. Conway**

**A-1012 KEYNOTE LECTURE: Memory, Imagination, and Creativity: Functions of Episodic Simulation and Retrieval**

Daniel L. Schacter
Harvard University

Numerous recent studies have explored the role of memory in imagining possible future experiences and related kinds of hypothetical events. Many of these studies have provided evidence that simulating possible events depends on much of the same neural and cognitive machinery as does remembering past events. According to the constructive episodic simulation hypothesis, simulation of future experiences depends importantly on episodic memory, which allows individuals to draw on the past in a manner that flexibly extracts and re-combines elements of previous experiences. Such flexibility is adaptive for simulating alternative scenarios based on past experiences, but it also may render the system prone to memory errors. This talk will address questions concerning constructive and functional aspects of episodic simulation and episodic memory, and will also consider evidence from recent studies that have used specificity inductions to characterize the contributions of episodic retrieval to a range of cognitive tasks, including imagination, problem solving, and creativity.

# Keynote session II

**K2 session**

Monday, 18 July 2016 | 08:30 - 09:20 | Room 1

**Chair/Organizer: Barbara Knowlton**

**A-1009 KEYNOTE LECTURE: Impact of Aging on Brain Circuits Critical for Memory**

Carol Barnes

Regents' Professor, Departments of Psychology, Neurology and Neuroscience, University of Arizona

Aging is associated with specific impairments of learning and memory, some of which are similar to those caused by damage to temporal or frontal lobe structures. For example, healthy older humans, monkeys and rats all show poorer spatial, recognition and working memory, than do their younger counterparts. Rats and monkeys do not develop age-related pathology such as Alzheimer's and Parkinson's diseases, which makes them good models for assessing functional alterations associated with normal aging in humans. While many cellular properties of medial temporal lobe cells appear to be intact in aging animals, age-related impairments in synaptic function, plasticity and gene expression have been observed. Because information is represented by activity patterns across large populations of neurons, an understanding of the neural basis of cognitive changes in aging requires the examination of the dynamics of behaviorally-driven neural networks. Ensemble recording experiments are described that suggest fundamental changes in the storage and retrieval of information, as well as in high level perceptual processing in aging hippocampal and perirhinal cortical circuits. In addition, frontal cortical correlates of working memory are discussed. Together the evidence suggests that normative aging processes show both cell type and region specificity, and rather than uniform deterioration, the aging brain can show changes consistent with adaptive, compensatory processes.

# Neural networks and interactions underlying episodic memory: evidence from functional connectivity

**S0029 session**
Monday, 18 July 2016 | 09:30 - 11:30 | Room 1
**Chair/Organizer: Jesse Rissman, Michael Rugg**
**Discussant: Michael Rugg**

**A-0989 Hippocampal-neocortical interactions during memory processes**
Nikolai Axmacher
Department of Neuropsychology, Institute of Cognitive Neuroscience, Faculty of Psychology, Ruhr University Bochum, Bochum, Germany
Functional interactions in EEG data can be measured as phase synchronization between oscillations in two (or more) brain regions. Phase synchronization has been associated with at least three different physiological mechanisms: Intraregional synchronization increases the impact of activity on downstream areas via coincidence detection; interregional synchronization facilitates information transmission by coordinating spike timing to excitable periods; and interregional synchronization may induce spike-timing dependent plasticity. These physiological functions are recruited during various cognitive functions, in particular related to short-term memory maintenance and long-term memory formation. In this talk, I will give examples of these mechanisms related to different memory processes in intracranial EEG data. In particular, I will show how memory functions depend on phase synchronization between hippocampus and neocortex.

**A-1006 Hippocampal contributions to the large-scale episodic memory network**
Roberto Cabeza, Benjamin Geib, Matthew Stanley
Center for Cognitive Neuroscience, Duke University, Durham, USA
Most fMRI studies have focused on the functions of individual brain regions, but a growing number of studies have been using network analyses to investigate how these regions interact during cognitive tasks. In contrast with network analyses that focus only on global network changes, we use graph theory to investigate the role of the hippocampus within the episodic memory network. We found that successful retrieval was associated with the hippocampus changing its connectivity profile to communicate more efficiently with the rest of the network. Connectivity changes involved regions directly connected with the hippocampus, including core regions of the episodic retrieval network. Retrieval success was associated with reduced modularity and greater network integration.

**A-0991 Understanding Age Differences in Memory Through Network Functional Connectivity**
Cheryl Grady
Rotman Research Institute at Baycrest; University of Toronto, Toronto, Canada
To identify neural mechanisms underlying age differences in memory we used several approaches to assess functional connectivity (FC). Brain-wide patterns of covarying activity can predict when participants are engaged in item vs. associative encoding. The ability to distinguish these two types of encoding not only is reduced in older adults but better prediction of these encoding “brain states” is related to better associative memory. Patterns of intrinsic network FC also predict subsequent memory performance, but these correlations differ with age. Individual differences in resting connectivity of the default network are strong predictors of episodic memory in older adults. These studies provide evidence that dynamic interactivity among brain regions is important for memory.

**A-0742 Cortico-hippocampal systems involved in memory and emotion**
Maureen Ritchey [1,2], Andrew P. Yonelinas [1], Charan Ranganath [1]
[1] University of California, Davis, USA; [2] Boston College, Boston, USA
An important principle in cognitive neuroscience is that brain connectivity and function are closely interrelated. I will present evidence that resting-state functional connectivity (FC) can provide insights into the memory functions of cortical and hippocampal regions. In one study, we used FC to identify networks of strongly-connected cortical and hippocampal regions. Using task fMRI, we then demonstrated that regions within the same network made similar contributions to associative memory encoding. In a second study, we focused on FC among amygdala and hippocampal subregions, relating hippocampal involvement in emotional memory encoding to its FC with the amygdala. The results provide support for the idea that there are separable cortico-hippocampal systems involved in memory and its modulation by emotion.

**A-1005 Episodic memory retrieval benefits from a less modular brain network organization**
Jesse Rissman, Andrew Westphal
University of California, Los Angeles, USA
We adopted a graph theoretical approach to examine how the brain network dynamics associated with episodic retrieval might differ from those engaged during other complex cognitive operations. Relative to closely matched tasks of analogical reasoning and visuospatial perception, large-scale fMRI connectivity dynamics during episodic retrieval showed reduced modularity, reflecting enhanced communication between networks that typically function in a more modularized fashion. This modularity reduction, which correlated with improved memory performance, was largely driven by strengthened coupling between the frontoparietal control network and default mode network. These results suggest that episodic retrieval benefits from a less modular brain organization, allowing goal-directed attentional control regions to interact with default mode network regions to facilitate the recovery and evaluation of task-relevant source details.

# Recognition / DRM / false memory I

**I071 session**
Monday, 18 July 2016 | 09:30 - 11:30 | Room 2
**Chair/Organizer: Asher Koriat**

**A-0153 Expected Test-Format Moderates Age-Related Differences in Recognition Memory**
Beatrice G. Kuhlmann
University of Mannheim, Mannheim, Germany
Age-related memory differences are more pronounced on recall than recognition tests. The present study examined whether merely expecting a recall test results in larger age-related differences even in recognition memory. Sixty younger (17-29 years) and 60 older (59-85 years) participants expected either recall or recognition during encoding but were then tested on recognition. Recall-expecting younger participants adopted better encoding strategies and outperformed their recognition-expecting peers. In contrast, older participants did not appropriately adjust encoding strategies and performance did not vary with the expected test format, even though they understood that the recall test would be more difficult. Consequently, age-group differences in recognition were substantially larger when expecting recall (d = 1.70) than when expecting recognition (d = 0.55).

**A-0161 Doubts about confidence**
Asher Koriat, Shiri Adiv
Department of Psychology, University of Haifa, Haifa, Israel
In many domains, people's confidence judgments are correlated with accuracy, indicating that people are skilled at discriminating between responses that are likely to be correct and those that are likely to be wrong. Sometimes the confidence/accuracy (CA) correlation is so high that researchers and practitioners take the accuracy of high-confidence judgments for granted. However, evidence has accumulated indicating that the C/A correlation can even be negative so that confidence is counterdiagnostic of accuracy. Negative C/A correlations were found for perceptual judgments, general knowledge, and memory judgments. Results will be reported that shed light on the determinants of subjective convictions, and on the relationship of subjective confidence to within-person consistency, cross-person consensus and the quality of group decisions. Keywords: Metacognition, Subjective Confidence.

**A-0275 Stealing and donating ideas: how typical?**
Timothy J. Hollins, Nicholas Lange
Plymouth University, Plymouth, UK.
Prior research has examined the tendency to misremember a partner's idea as one's own (unconscious plagiarism), but not the reverse error (unconscious donation). This study explored both kinds of source error. Pairs of participants generated typical (T) or atypical (A) category exemplars in a fully crossed design (TT, TA, AT or AA pairs). Individuals subsequently recalled their own or their partner's ideas. Overall, source errors were more frequent during the recall partner task (idea donations). Typical ideas produced more source errors, but source errors were highest when the typicality of the ideas matched across sources (TT+AA > TA+AT). No typicality effects were observed for intrusion rates. Implications of this pattern for accounts of unconscious plagiarism will be discussed.

**A-0277 On the Shape of Signal-Detection Distributions in Individual Recognition ROC Data**
Simone Malejka, Arndt Bröder
University of Mannheim, Germany
The form of receiver-operating characteristics (ROCs) has long been used to compare Gaussian signal-detection theory (SDT) and the two-high-threshold (2HT) model of recognition. However, many empirical ROCs are less/more curved than predicted by the SDT/2HT model. Reformulating the 2HT model as rectangular SDT leaves the different shapes of the memory distributions as only formal difference. In a series of empirical studies, we explore the shapes on aggregated and individual level using SDT with Tukey-lambda distributions. This family of distributions contains Gaussian and rectangular as special cases—expressed by a shape parameter. The results show that the shape estimates cover a wide range and that many memory distributions are hybrids of Gaussian and rectangular. Implications for modeling recognition memory are discussed.

**A-0126 Recollection, familiarity, priming and the entorhinal cortex**
Kaz Brandt [1], Mike Eysenck [1], Maria Nielsen-Kragh [1], Tim von Oertzen [2]
[1] University of Roehampton, London [2] Wagner-Jauregg Neuroscience Centre, Kepler Universitätsklinik, Linz, Austria
We explored the effects of selective impairment to the left entorhinal cortex on familiarity and recollection processes. Four experiments tested recognition memory for familiar and unfamiliar faces and words in patient MR and age and IQ-matched control participants. A fifth experiment tested participants' priming associated with the familiarity process. MR had intact performance in both face recognition experiments and in pseudoword recognition. However, whilst MR performed normally for familiar word recollection, she showed a marked impairment in familiarity for these items. Furthermore, she also demonstrated a reversed conceptual priming effect. These results suggest the entorhinal cortex does not have attributes reflective of both recollection and familiarity as previously assumed, but rather supports context-free long-term familiarity-based recognition memory.

**A-0503 Perceptual similarity versus conceptual similarity: What drives children's false memories?**
Marina Wimmer, Julie Wheeler
University of Plymouth, UK
Early in development, encoding depends more on perceptual systems that might also influence false memory formation. We therefore examined the combined effects of perceptual factors (between-item similarity) and conceptual factors (associative strength) on children's false memory. Five-, and 7-year-olds (N = 200) completed a modified DRM-paradigm in pictorial form. Findings indicate that conceptual factors (associative strength) influenced both 5- and 7-year-olds' false memories whereas perceptual factors (all items as coloured photographs versus alternating with black and white photographs versus black and white photographs) had no effect. This suggests that children's false memories are primarily driven by conceptual factors. The perceptual-conceptual shift may not exist in false memory formation, giving them theoretical uniqueness.

**A-0067 The contribution of gist memory to false recognition in short-term memory**
Marlène Abadie, Valérie Camos

Université de Fribourg, Fribourg, Switzerland

Gist-based processing has been proposed to account for false memories in long-term memory tasks. Recent research showed that recognition errors also occur within seconds of encoding. The aim of the present study is to examine the contribution of gist to false memory at short delays. Participants encoded either lists of four semantically related or unrelated words, a manipulation affecting gist memory at long term. Participants were then probed following a 4 seconds filled retention interval. We expect that, when a concept is repeatedly activated at study by semantically related items, gist memory will be increased while verbatim memory will remain unaffected and correct rejections of related lures will be slower even when mere seconds are given between study and test.

# Prospective memory

**I091 session**
Monday, 18 July 2016 | 09:30 - 11:30 | Room 3
**Chair/Organizer: Jason L. Hicks**

**A-0007 The curious case of Prospective Memory: A hierarchical measurement model of age differences**
Antonina Pereira, Victor Meirinhos, Nik Chmiel
University of Chichester
Prospective memory (PM) is a fundamental requirement for independent living, implicated in many everyday tasks. It is therefore unsurprising that failures of PM are one of the most prominent memory concerns across the human lifespan. Measurement models of age differences in PM are very scarce and have generally failed to produce consistent results so far. We establish a hierarchical measurement model that distinguishes 3 levels that cumulatively account for the explanation of the variance in objective measures of PM for both young and older adults. We propose that cognitive ability (attention and orientation, memory, fluency, language and visuospatial skills), complexity of the ongoing task and perceived cognitive efficiency are hence mediators of the complex relationship between PM and age.

**A-0399 Differential effects of working memory components on time-based prospective memory in children**
Natalie Lynette Phillips [1], David Shum [2], Suncica Lah [1]
[1] The University of Sydney, Sydney, Australia; [2] Griffith University, Gold Coast, Australia
Objective: The role of working memory (WM) components (comprising a central executive [CE], phonological loop [PL] and visuospatial-sketchpad [VSSP]) on time-based prospective memory (TBPM) in children was examined. Methods: Thirty-four children (8-15years) completed a newly developed two demand levels (low, high WM) TBPM task and WM (CE, PL, VSSP) tests. Results: Irrespective of age: (i) high compared to low demand resulted in greater TBPM failures; (ii) only the CE predicted TBPM on the low demand task; (iii) both CE and PL predicted TBPM on the high demand task. Conclusions: The CE is critical to successful TBPM in children regardless of the level of demand. When CE resources are taxed under increasing demands, however, the PL also serves to support TBPM.

**A-0933 Ecological prospective memory assessment in early Alzheimer's disease and semantic dementia: evidence from virtual reality**
Valentina La Corte [1,2,6], Valentine Facque[1,2], Maria Abram[1,2], Agnès Michon [4], Techimann Marc [4,5], Bruno Dubois [4,5], Pascale Piolino [1,2,3]
[1]Institute of Psychology, University Paris Descartes, Sorbonne Paris Cite, France [2]INSERM UMR 894, Center of Psychiatry and Neurosciences, Memory and Cognition Laboratory, Paris, France [3]University Institute of France, Paris, France [4] Institut de la Mémoire et de la Maladie d'Alzheimer (IM2A), Département de Neurologie, Hôpital Pitié-Salpêtrière, AP-HP, Paris, France [5] Institut du Cerveau et de la Moelle Epinière (ICM), CNRS UMR 7225- INSERM U1127 Paris, France; Sorbonne Universités, Université Pierre et Marie Curie-Paris 6, Paris, France [6] IDEX 'Dynamique du Vieillir', Sorbonne Paris Cité, Université Paris Diderot, France
Prospective memory (PM) is the ability to form, maintain and execute intended actions after a delay, in the appropriate context in the future. The realization of intentions consists in remembering that something has to be done in the future, remembering the exact action to be executed (retrospective component) and the context in which it has to be done (prospective component). The aim of this study was to investigate the cognitive mechanisms underlying PM deficits in Alzheimer's disease and semantic dementia patients using a naturalistic environment created with virtual reality. Results show dissociation in the profile of impairments in both patients groups. The findings will be discussed regarding the role of episodic and semantic memory in the prospective component of memory.

**A-0949 Response Sequencing Effects on Prospective Memory Retrieval and on Commission Errors**
Jason L. Hicks [1], Samantha Spitler [1], Anna-Lisa Cohen [2]
[1] Louisiana State University, Baton Rouge, LA, USA; [2] Yeshiva University, New York, NY, USA
Commission errors in prospective memory (PM) occur when people inappropriately respond to intention-related cues after an intention has been finished or cancelled. We present outcomes from studies demonstrating response-sequencing effects on commission errors and on accurate PM responding. Commission errors following intention cancellation were low in general, but replicating prior work were highest when people had no opportunity to respond to PM cues in a prior PM-active phase. A novel outcome was that requiring people to respond to PM cues immediately after an ongoing task response (response sequencing) consistently decreased commission errors and also accurate PM. In addition, we present new data on the likelihood that presenting PM cues following intention cancellation produces confusion among participants.

# Retrieval processes I

**I011 session**
Monday, 18 July 2016 | 09:30 - 11:30 | Room 4
**Chair/Organizer: Almut Hupbach**

**A-0116 Testing effect on a university course: Studying repeated questioning and test format**
Pedro Simão Mendes [1], Pedro B. Albuquerque [1], Véronique Quaglino [2]
[1] Escola de Psicologia, Universidade do Minho, Braga, Portugal; [2] Université de Picardie Jules Verne, Amiens, France
The testing effect occurs when repeated testing benefits long-term retention (compared to non-testing/repeated studying). There is a growing interest on transferring the testing effect to the classroom. Test format (multiple-choice or short-answer) is known to affect the magnitude of testing. Sixty-seven college students answered 12 weekly-one-topic Quizzes and two Intermediate Tests about 6 topics each, with repeated, related, and new questions. Results showed that students' performance was better for repeated (M=.78) than for related (M=.73) and for new (M=.62). On a Final Exam, students' performance was better for questions repeated twice (M=.84) or once (M=.77) when comparing to new questions (M=.72). Our study revealed the presence of testing effect on a university course, and a benefit of non-tested related material.

**A-0273 Modification of Episodic Memories during Memory Reconsolidation: A Replication Study**
Kevin van Schie, Suzanne C. van Veen, Marcel A. van den Hout, Iris M. Engelhard
Utrecht University, Utrecht, the Netherlands
After reactivation, memories can become unstable and sensitive to modifications before they are restored into long-term memory, which is called reconsolidation. Using behavioral manipulations, reactivated memories can be disrupted via the mechanism of interference (i.e., novel learning). Using these manipulations, Wichert et al. (2013a) showed that new learning after reactivation negatively affected episodic memory, while new learning alone or reactivation alone did not. We aimed to replicate this study and analyzed the data using Bayesian hypothesis testing, which allows for quantifying the evidence in favor of the alternative hypothesis and the null hypothesis. We were able to largely replicate Wichert et al., but did not find the crucial difference between new learning following reactivation and new learning alone.

**A-0296 What Triggers Memory Updating? Exploring the Impact of Reactivation Strength**
Iiona D. Scully, Almut Hupbach
Lehigh University, Bethlehem, PA, USA
In this talk, I will present two experiments asking whether strength of reactivation affects memory updating. On Day 1, participants learned List 1. On Day 2, memory was strongly, moderately or not reactivated. Afterwards, participants either learned List 2 or performed an unrelated distractor task. On Day 3, memory for List 1 was assessed. The results indicate that strength of reactivation and amount of intrusions from List 2 into List 1 were related in an inverted U-shape function. No or strong reactivation resulted in low levels of intrusions, while moderate reactivation resulted in high levels of intrusions. This finding suggests that strong reactivation enhances trace distinctiveness, reducing the probability of reactivation-dependent memory modification.

**A-0311 Testing better than studying? Familiarity-based memory benefits from retrieval practice**
P.Y. Jonin [1,2,3], M. Duivon[1], G. Besson [1], S. Belliard [3], Q. Duché [2], C. Barillot [2], EJ. Barbeau [1]
[1] Centre de Recherche Cerveau et Cognition, CNRS, CerCo, UMR 5549, Toulouse, France [2] Inria, VISAGES Project-Team, Université de Rennes 1, INSERM, U746, CNRS, IRISA, UMR 6074, Rennes, France [3] CHU Pontchaillou, Service de Neurologie, Rennes, France
The testing effect refers to the advantage of taking tests over studying stimuli for long term memory. Why this effect occurs remains ill-understood. Dominant proposals assume that the act of retrieval itself mediates the effect, due to more elaborative processes engaged during initial encoding through testing vs. studying. We used the Speed and Accuracy Boosting procedure that allows a direct estimate of familiarity-based recognition memory, thus greatly limiting active retrieval strategies. 31 healthy participants were administrated the experiment within a cross-sectional design. Repeated testing during encoding resulted in better long-term retention than repeated studying. We thus report one of the first evidence for a testing effect in recognition memory, speaking against the dominant retrieval account for testing effect.

**A-0377 The role of rehearsal of task goals in interrupted task settings**
Laura Zeidler, Sophie Neef, Dietrich Manzey
Berlin Institute of Technology (TU), Department of Psychology and Ergonomics, Berlin, Germany
Rehearsal of task goals has been identified as the core strategy to reduce performance losses when resuming a primary task after an interruption. To investigate what time is needed for effective rehearsal before starting the interruption task, we analyzed the impact of different interruption lags on resumption performance. We hypothesized that the longer the possibility to rehearse before an interruption, the less performance losses should occur after an interruption. We further assumed that this effect would be stronger for participants with low than high working memory capacity (WMC). In a laboratory experiment (n = 34) a sequential task with short interruptions (2-back task) and five different interruption lags were assessed. Resumption lags and error rates were assessed as performance measures.

**A-0390 Memory Retrieval: Explicit Access Based on Evidence Accumulation Model**
Christelle Larzabal [1,2], Nadège Bacon-Macé [1,2], Sophie Muratot [1,2], Simon J. Thorpe [1,2]
[1] Université de Toulouse, UPS, Centre de Recherche Cerveau et Cognition, France [2] CNRS, CerCo, Toulouse, France
Access to memories becomes harder over time. In this study, the EEG activity of 10 participants was recorded in response to snapshots taken from videos that had been seen 3 weeks, 1 day or a few hours earlier or never seen. ERP and MultiVariate Pattern analyses revealed weak but early differential activity for snapshots seen 3 weeks ago which were associated with slow reaction times. By contrast, pictures seen more recently elicited later and stronger activity and were associated with faster responses. The overall data support the idea of considering explicit recall as a decision based on evidence accumulated over time and might constitute a potential theoretical framework in the unification of perception and memory. Keywords: Memory; Retrieval; evidence accumulation

**A-0663 The effect of retrieval practice on piano music memorization**
Yana Weinstein [1], Paula Telesco [1], Kelsey Gilbert [1], Sarah Lipitz [2]
[1] University of Massachusetts - Lowell; [2] Brandeis University

Musicians - particularly pianists - memorize a lot of information. This study applies the retrieval practice paradigm to music memorization. Thirty participants who self-identified as being able to read music played simple musical pieces on a keyboard. There were three within-subjects conditions: study (playing with the music) 10 times, study 5 times then test (play without the music) 10 times, and 5 interleaved study/test cycles. In the criterion test 10 minutes after each piece was practiced, participants played the piece from memory. We compared memory accuracy for the piece that was studied by repeated re-playing from sheet music, the piece that was studied with massed retrieval practice, and the piece that was studied with interleaved re-playing and retrieval practice.

# What musical memories can tell us about autobiographical memory

**S0062 session**

Monday, 18 July 2016 | 09:30 - 11:30 | Room 5

**Chair/Organizer: Catherine Loveday, Trudi Edginton**

**Discussant: Martin A. Conway**

**A-0997 Autobiographical memory retrieval is influenced by the age and emotionality of background music**

Chris J.A. Moulin [1], Noelene Connelly [2]

[1] LPNC CNRS 5105, Université Grenoble Alpes, France; 2) Institute of Psychological Sciences, University of Leeds, UK

Recent research suggests that background music facilitates autobiographical retrieval. This effect has mostly been studied in impairment, and less is known about how music enhances memory. We examined a cueing effect by having participants conduct a Crovitz task at the same time as listening to songs. Pre-testing selected well-known songs from different years (1996/2002) and which were rated as emotionally positive or negative. After memories were generated, they were dated and rated. We found significant differences in the date of the memories retrieved, and the rated emotional valence of memories according to these two factors. Thus, in a healthy sample, even when encountered in the background, music influences which autobiographical memories come to mind.

**A-0998 The reminiscence bump for musical memories in musicians and non-musicians**

Catherine Loveday [1], Martin A. Conway [2]

[1] University of Westminster, London, UK; [2] City University, London, UK

A number of studies have shown that adults show a preference and better recognition for music released during their adolescence and young adulthood – the reminiscence bump period. So far this phenomenon has not been investigated using free recall and has been limited to popular music. In this study, a group of musicians and non-musicians were asked to select 10 pieces of music that they considered most significant in their lives and to provide a reason. Results confirmed the presence of a reminiscence bump for music and showed that this occurred earlier than is usually observed for other memories. This effect was increased in musicians compared to non-musicians, offering support for theories linking the reminiscence bump to identity formation.

**A-0999 Memories of The Beatles**

Catriona M. Morrison [1], Martin A. Conway [2]

[1] University of Bradford, UK; [2] City University, London, UK

In a large-scale study we asked people for their memories of The Beatles. Almost four thousand people completed an online questionnaire that asked them for their most salient memory associated with The Beatles, be it a song, album, event or even a personal encounter. We received responses from all over the world. Only a small number of responses (

**A-1000 Which songs would you take to a desert island? A naturalistic investigation of music and memory**

Amy Woy [1], Catherine Loveday [1], Martin A. Conway [2]

[1] University of Westminster, London, UK; [2] City University, London, UK

Desert Island Discs is a long-running BBC Radio 4 program that invites well-known guests to select eight recordings they would take with them if stranded alone on a desert island. We transcribed 70 interviews from guests from a broad range of professions and ages. Where possible we recorded the age period, genre and popularity of the music selected, as well as the reason for the choice. Overall we demonstrated the presence of a reminiscence bump, although individuals from some professions were less likely to conform to this pattern. In line with other research, music was strongly linked to autobiographical remembering but with a bias towards songs that would trigger memories of people. We discuss the relevance for reminiscence therapy.

**A-1001 Two mechanisms of music-associated autobiographical memories**

Carol Lynne Krumvansl

Cornell University, New York, USA

“Cascading reminiscence bumps” (Krumhansl & Zupnick, 2013) reported survey results showing intergenerational transfer of musical preferences from parents to contemporary young adults. The parents’ music (from their own late adolescence and early adulthood, the typical “reminiscence bump”) was associated with positive emotions and strong autobiographical memories in their children. I will report the results of a new survey using 100 years of top hits and 6 decades of music listeners. Older generations listened to different music with friends and parents, and do not exhibit the cascading effect to the same degree. Across generations, however, preferences were found for music of the 40’s, 60’s, and 80’s, suggesting the music technology developed during those decades is another mechanism promoting music-associated autobiographical memories.

**A-1002 Is there a musical reminiscence bump in people with memory impairments?**

Trudi Edginton [1], Catherine Loveday [1], Alison Eardley [1], Martin A. Conway [2]

[1] University of Westminster, London, UK; [2] City University, London, UK

The ability to recognise and respond to familiar music is often robust in people with memory impairments, such as dementia and amnesia, and recent research suggests that music is a good cue for autobiographical remembering. This study used a free recall approach to investigate memory for music across the lifespan in people with hydrocephalus and Mild Cognitive Impairment. Results showed the presence of a reminiscence bump in these memory impaired individuals but significantly reduced specific episodic memories associated with the music. We conclude that organization of memory remains intact but that music is more likely to evoke generic or implicit remembering. We also suggest that music may offer a novel and interesting way of assessing memory.

## The impact of culture, age, and psychopathology on autobiographical memories and life stories

**S0010 session**
Monday, 18 July 2016 | 09:30 - 11:30 | Room 6
**Chair/Organizer: Christin Köber**
**Discussant: Norman Brown**

**A-1015 Cultural differences in life narrative coherence and autobiographical reasoning**
Tilmann Habermas, Neşe Hatiboğlu
Goethe University Frankfurt, Germany
Secular trends in individualization require increased autonomy and individualized self-definitions. Therefore the life story might offer the most adequate, because flexible format for the self-concept. We expected life narratives to be more coherent in a modern compared to a more traditional cultural context, coherence being necessitated by more individualized trajectories of life. A total of 96 students of technical universities in a Turkish provincial center (Karabük) and metropolis (Istanbul) and 2nd generation migrants and native Germans in a major German city (Frankfurt) told short life narratives. As expected, there was a linear increase in global coherence across these groups. However, autobiographical arguments were most frequent in the two Turkish groups. Possible reasons for the apparently contradictory findings are discussed.

**A-1016 Adapting Life: Stability and Reasons for Change of Important Autobiographical Memories and Life Narratives**
Christin Köber, Tilmann Habermas
Goethe University Frankfurt, Germany
Personal importance of autobiographical memories is influenced by current goals and concerns. Accordingly, not all memories once claimed to be important or self-defining retain this attribute throughout life. Yet, researchers assume that to maintain personal identity over time, important memories are retained. We investigated the stability of autobiographical memories and life narratives longitudinally in a lifespan sample aged 8 to 70. Stability was measured as percentage of memories and narrative segments repeated in later tellings. Stability increased most between ages 8 and 28. Further, we explored which kinds of life events were repeated, finding that normative transitional events were more stable than others. Additionally, we present participants' explanations why they did not repeat some of the formerly selected life events.

**A-1017 Cultural Life Script of Later Adulthood**
Azriel Grysman, Sarah Dimakis
Hamilton College, Clinton, NY, USA
Cultural life scripts structure thoughts about past and future events. This study established the life scripts of individuals after the most prevalent and most positive events in the cultural life script have passed, namely after the first (approximately) 35 years of one's life. Results indicate three types of later adult LS events: normative, later adult, and attending relatives' LS events. Expected age of event and other phenomenological properties raise questions as to the structure and function of these scripts, but support a scripted nature of new events after the most formative and positive events have occurred. Finally, expected conformity to cultural norms predicted well-being, supporting an approach to the LS as promoting meaning by providing structure.

**A-1018 Past and future life stories in youths with anxiety disorders and community controls**
Stine Breum Ramsgaard, Annette Bohn
Center on Autobiographical Memory Research, Department of Psychology and Behavioral Sciences, Aarhus University, Denmark
The ability to tell a life story and imagine the future serves important social and life defining functions like maintaining identity. Here, 34 youths diagnosed with anxiety disorders and 34 community based controls wrote stories about their weekend, their past and future life stories and generated cultural life scripts. Youths in the anxiety group had less coherent past and future life stories compared to controls. Weekend stories did not differ in length and coherence between groups, suggesting that differences in life story coherence are not due to differences of general narrative ability. The control group mentioned more life script events in future life stories suggesting that they imagine their future lives as more "normative" than youths in the anxiety group.

**A-1019 Self-continuity across time in schizophrenia**
Mélissa C. Allé [1], Arnaud D'Argembeau [2], Priscille Schneider [1], Jevita Potheegadoo [1], Romain Coutelle [3], Jean-Marie Danion [1], Fabrice Berna [1]
[1] University Hospital of Strasbourg, INSERM U1114, University of Strasbourg, France [2] Department of Psychology, University of Liège, Belgium [3] Centre Psychothérapique de Nancy, Centre de Ressources Autisme de Lorraine, France
Disorders of the self are a core symptom of schizophrenia, but still poorly understood. We have investigated two complementary aspects of self-continuity across the time, namely phenomenological and narrative continuity, in 27 patients with schizophrenia and 27 matched controls. Participants were firstly asked to narrate a story of their life including important and specific past events, and then asked to imagine a narrative of their future life containing imagined future events. Our results showed that the memory vividness of these life-events was observed significantly lower in both temporal directions, past and future. Moreover, patients' ability to establish explicit connections between personal events and attributes of self in life narratives was also impaired, but only in the case of past narratives.

**A-1020 Impact of childhood trauma and PTSD on autobiographical memory of elderly adults and their offspring**
Fabrice Berna [1], Lena Jelinek [2], Birgit Kleim [3], Christoph Muhtz [2], Steffen Moritz [2], Charlotte Wittekind [2]
[1] University Hospital of Strasbourg, INSERM U1114, University of Strasbourg, France [2] University Medical Center Hamburg-Eppendorf, Department of Psychiatry and Psychotherapy, Hamburg, Germany [3] Department of Clinical Psychology and Psychotherapy, University of Zürich, Zürich, Switzerland
The present study investigates the interaction between trauma and aging in autobiographical memory (AM) and its trans-generational expression. Forty-four elderly participants, displaced during childhood from former German territories after the end of World War II (19 with and 25 without PTSD), were compared to 23 non-traumatized non-displaced elderly participants. One offspring of each elderly participant was also included. Results show that PTSD, non-PTSD and non-traumatized elderly participants do not differ significantly in their ability to recall specific memories of their past. Similar results were obtained in offsprings. Moreover, elderly PTSD participants did not recall more trauma-related memories than non-PTSD participants. Our results suggest that aging may alter the relationship between trauma and AM impairment in PTSD participants.

# Adaptation and prediction in sensory memory

**S0001 session**

Monday, 18 July 2016 | 09:30 - 11:30 | Room 7

**Chair/Organizer: István Czigler, István Winkler**

**A-0294 Predictive sound representations: beyond transitional probabilities**

Juanita Todd [1], Daniel Mullens [1], Andrew Heathcote [1,2], István Winkler [3,4]

[1] School of Psychology, University of Newcastle, Australia; [2] School of Medicine, University of Tasmania, Australia; [3] Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary; [4] Institute of Psychology, University of Szeged, Hungary

The auditory system extracts transitional probabilities from sound sequences and uses this information to predict upcoming sounds. Deviations from the predicted sound elicit an event-related brain potential component termed the mismatch negativity (MMN). The MMN amplitude typically decreases with increasing variability of the sequence, suggesting that sequence stability affects the confidence or specificity of the predictions. However, a series of recent studies showed that “first impression” - the role of the sounds as either frequent/predictable or infrequent/unpredictable within the sequence a listener first encounters - modulates the effects of sequence stability on the MMN amplitude. Here we show how the large-scale structure of sound sequences affects the encoding and elimination of first-impressions.

**A-0378 Stimulus repetition effects: one mechanism or more?**

Gyula Kovács, Catarina Amado

Inst. Psychology, Friedrich Schiller University, Jena, Germany

A long tradition of electrophysiological oddball studies, showed that neural responses to a given stimulus differ when they occur frequently (standards) as compared to rare presentations (deviants). One of the major concepts, explaining the standard/deviant differences is predictive coding (PC). More recently, the same PC models have also been applied to the neural mechanisms of repetition suppression of the BOLD signal in fMRI experiments. As both methods measure signal changes, related to the regularities of the environment here we tested the possible connections between the two phenomena. We briefly review the similarities and differences of the available electrophysiological and neuroimaging data in the visual modality and we also present how PC can explain the different stimulus repetition related phenomena.

**A-0431 Violation of regularity and/or stimulus specific adaptation in vision**

István Czigler, Flóra Bodnár, Domonkos File, Krisztina Kecskés-Kovács, István Sulykos

Institute of Cognitive Neuroscience and Psychology, Centre for Natural Resesach, HAS, Budapest and Eötvös Loránd University, Budapest

In a passive oddball sequences infrequent (deviant) visual stimuli elicit larger posterior negativities of event-related brain activity than the frequent (standard) ones. This negativity emerges as an effect on the standard (stimulus-specific adaptation, SSA), and/or on the (visual mismatch negativity, vMMN). The relative weight of the two processes is a function of the particular stimuli. In case of background textures SSA explains the reduced standard-related activity, whereas for figures the difference is due to both SSA and vMMN. Both SSA and vMMN are related to memory processes, SSA emerges when the incoming event is congruent to an established memory representation, and vMMN is an index of violated representation of a sequential regularity, established by the frequent (standard) stimuli.

**A-0741 Auditory scene analysis: patterns of things to come?**

Susan L Denham [1,2], Orsolya Szalárdy [3], Robert W. Mill [1], István Winkler [3,4]

[1] School of Psychology, University of Plymouth, Plymouth, UK [2] Cognition Institute, University of Plymouth, Plymouth, UK [3] Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary; [4] Institute of Psychology, University of Szeged, Hungary

Perception depends on detecting and using representations of sensory patterns to make sense of the world. Patterns playing out both in time and feature space provide expectations of future events, and the basis for decomposing the world into discrete objects and for meaningful novelty detection. Without expectations everything is jumbled, new and somehow incomprehensible. However, patterns come and go. So the perceptual system needs some way of allowing its operational representations to form and dissolve, dominate and yield, in a way that facilitates veridical perception. In this talk I will discuss some of the issues of pattern discovery, maintenance and deletion at different timescales and levels of complexity using exemplar models of SSA and auditory streaming, and new perceptual data.

**A-0953 Adaptation as the mechanism of temporal binding, prediction, and sensory memory in auditory cortex**

Patrick J. C. May

Special Laboratory Non-Invasive Brain Imaging, Leibniz Institute for Neurobiology, Magdeburg, Germany

The auditory system requires a memory mechanism which binds information over time so that incoming sounds can be represented in the context of preceding events. I present the case that short-term synaptic plasticity (adaptation) offers such a mechanism. Simulations of auditory cortex show that adaptation is necessary for cortical columns to respond selectively to auditory stimuli with a temporally evolving structure, e.g. tone sequences and speech sounds. Adaptation is also shown to underlie response attenuation and recovery phenomena seen in non-invasive measurements. These (N1/MMN) phenomena have previously been linked to sensory memory and prediction. Thus, the results suggest that temporal binding, prediction, and sensory memory are all facets of the same dynamical system, with adaptation being the central explaining mechanism.

**A-0984 Repetition suppression and repetition enhancement of ERPs to unattended objects**

Gabor Stefanics [1,2], Jakob Heinzle [1], Justin Chumbley[1], Klaas Enno Stephan [1]

[1]Translational Neuromodeling Unit (TNU), Institute for Biomedical Engineering, University of Zurich & ETH Zurich, Switzerland [2]Laboratory for Social and Neural Systems Research, Department of Economics, University of Zurich, Switzerland

Neuroimaging studies often observe repetition suppression (RS) and repetition enhancement (RE) which are thought to reflect ongoing statistical learning. We studied RS and RE of ERPs to natural object scenes and line-drawn objects. For each subject, we estimated a GLM with an exponential function to quantify changes in ERPs over repetitions using SPM12. Model estimates were analyzed at the group-level with t-tests. Our aim was to determine the time course and scalp distribution of repetition effects. In both experiments model estimates revealed early RS and later RE effects. Automatic perceptual processing of objects involves both RS and RE. RS and RE might represent correlates of decreasing prediction errors and increasing confidence of predictions over repetitions, respectively.

**A-0284 What omissions of expected sounds can tell us about the brains predictive processing**

Erich Schröger [1], Iria SanMiguel [2]
[1] Leipzig University, Germany; [2] University of Barcelona, Spain
Brain responses to the omission of an expected stimulus are direct evidence for the hypothesis that our brain generates predictions about forthcoming stimuli. We report brain responses that (to some extent) mimic the responses that are elicited when the stimulus actually is delivered. For example, when a button-press did not trigger the expected sound (omission) an N1-like event-related potential was elicited. In the context of predictive coding theory, this is explained as a prediction error signal being defined as the difference between the top-down prediction (i.e. the sound) and the bottom-up sensory input (i.e. the silence). Here, the prediction error is identical to the prediction. Thus, omission responses can serve as a tool to study prediction templates.

# Building semantic knowledge: Fast mapping and slow assimilation

**S0005 session**

Monday, 18 July 2016 | 09:30 - 11:30 | Room 8

**Chair/Organizer: Marc N. Coutanche, Sharon L. Thompson-Schill**

**Discussant: Sharon L. Thompson-Schill**

**A-0052 Word learning, fast and slow: A complementary systems account**

M. Gareth Gaskell

University of York, UK

Decades of language research have led to the understanding that we form robust and usable representations of words essentially immediately after exposure. This view of word learning as an encoding issue has been supplemented more recently in response to research suggesting that slower, sleep-associated consolidation processes lead to some of the “lexical” properties that we expect of words we know well. I will discuss a complementary systems account of word learning intended to make sense of this dissociation between immediate and emergent properties of lexical items, and evaluate its ability to explain recent inconsistent findings relating to engagement of new words in lexical competition.

**A-0033 Can neocortical plasticity support new semantic learning independently of the hippocampus?**

Asaf Gilboa [1,2,3]

[1] The Rotman Research Institute at Baycrest, Toronto, ON, Canada; [2] Department of Psychology, University of Toronto, ON, Canada; [3] Canadian Partnership for Stroke Recovery, Canada.

The hippocampus and medial temporal lobe (MTL) systems are critical for forming new long-term declarative memory until necortical slow consolidation processes occur. A possible exception to this well-established rule is associative learning through Fast Mapping (FM). During FM the meaning of new words and concepts is inferred by exclusion using contextualized prior knowledge, and durable novel associations are incidentally formed. Data from neurological patients (amnesia, dementia) suggest this kind of learning might occur with no or with minimal hippocampal support. Anatomical and functional imaging studies identify the anterior and lateral temporal cortices as possible sites that support this learning. Activation of related but non-overlapping prior associative networks could be a mechanism that allows this unexpected semantic learning.

**A-0048 Do memory representations gained via Fast-Mapping undergo changes in time?**

Maayan Merhav

German Center for Neurodegenerative Diseases (DZNE), Magdeburg, Germany

Re-organization of declarative memories suggests that the mnemonic binding role of the hippocampus is over the time replaced by cortical hubs. If learning via Fast-Mapping can bypass the hippocampal-dependent phase, will its mnemonic representation undergo changes overtime? BOLD responses during retrieval of associations gained either 30min or 24h earlier indicated poor overtime changes. While a ‘standard’, intentional learning showed a vast overnight increase in BOLD responses and increased functional connectivity, learning via Fast-Mapping showed minimal overnight changes in BOLD responses and no connectivity changes. Behavioral interference however, indicated overtime changes. Overlapping associations did not interfere if learned right after Fast-Mapping, but caused catastrophic-interference, a cortical-learning hallmark, if learned on the next day. Nevertheless, this short interference-resistance phase requires MTL integrity.

**A-0078 Exploring the nature of fast mapped knowledge through divided attention**

Marc N. Coutanche [1], Marvin M. Chun [2]

[1] University of Pittsburgh, Pittsburgh, Pennsylvania; [2] Yale University, New Haven, Connecticut

Recent investigations suggest that learning new words through fast mapping might accelerate their incorporation into memory, without hippocampal involvement. We have examined how learned information responds to hippocampally-driven attentive re-encoding, to compare memory traces after fast mapping and related paradigms. We introduced participants to new animals through fast mapping, perceptual judgments or semantic judgments. Participants then retrieved and re-encoded this knowledge under full or divided attention. A follow-up test revealed that retrieval under full, compared to divided, attention improved recognition of animals encountered through perceptual or semantic judgments, but not through fast mapping. We consider this dissociation in the context of other divided attention/memory findings, and discuss the implications for our understanding of learning through fast mapping.

**A-0054 Cortical and hippocampal signatures of memory formation in very young children**

Rebecca Gomez, Katharine Newman-Smith

The University of Arizona

We investigate the contributions of distinct learning systems in preschool-age children. Cortical learning available early in development should require many exposures for encoding with retrieval subject to interference. Hippocampus, once sufficiently mature, should support rapid encoding with retrieval robust to interference. Therefore, fast mapping (FM) and explicit encoding (EE) both should show cortical hallmarks in the youngest ages. Once hippocampus is sufficiently mature, encoding profiles should diverge: EE, dependent on hippocampus, should reflect hippocampal hallmarks of encoding; FM, dependent on cortex should reflect cortical hallmarks. Consistent with this prediction, younger ages required more exposures for encoding with retrieval subject to interference. Encoding profiles diverge at older ages with EE and FM showing different hallmarks, consistent with increasing hippocampal involvement.

# Poster session I

**P1 session**

Monday, 18 July 2016 | 11:30 - 13:00 | Aula

**A-0006 What drives the delay advantage for emotional false memories?**

Samantha Wilkinson, Lauren Knott, Mark L. Howe
City University London, UK

We examined why the DRM paradigm results in a preferential increase in false memory, particularly emotional false memory, over veridical memory across time. One idea concerns the primary source of true and false memories in the DRM paradigm; namely that true memories are externally generated (other-generated, presented items) whereas false memories are internally generated (self-generated, non-presented items). In Experiment 1 participants studied neutral and emotional DRM lists, half contained the critical lure (externally-generated) and half did not (internally-generated). Memory tests were administered immediately or one-week later. Experiment 2 replicated Experiment 1 but memory was tested after a period of sleep or wakefulness. We discuss how emotions and delayed intervals influence the formation of false memories.

**A-0009 Where did I see that? Age differences in source memory and response bias contribute to differential retrieval of previously irrelevant information**

Emma V. Ward
Middlesex University, London

Older adults show greater performance than young adults for previously irrelevant information on tasks with indirect memory instructions. This has been attributed to greater suppression by young adults. Weak source memory may lead young adults to dismiss previously irrelevant items, whereas older adults may be more liberal in their use of any familiar item. Participants indicated the text color of words before studying a word list partly comprised of words from the initial phase. Recognition and priming of previously irrelevant words (words shown only in the color naming task) was greater in young than older adults, but source memory was age-equivalent. Compared to young adults, older adults had a greater tendency to make positive recognition judgments for previously irrelevant items.

**A-0010 Do quantitative and qualitative measures of visual working memory capacity predict intelligence in 7-11 year old children?**

Laura Jenkins, Colin Hamilton
Northumbria University, Newcastle-upon-Tyne, UK

The association between working memory processes and intelligence have been extensively investigated in adults. More recently there has been a distinction between quantitative and qualitative measures of memory performance and how they may be related to intelligence. This research has suggested that quantitative measures are stronger predictors. However, recent developmental findings have suggested that in children qualitative measures may be important predictors of intelligence. In a novel combination of change detection protocols, the current research aims to identify whether quantitative or qualitative measures were more strongly associated with verbal and nonverbal intelligence in children. The results are discussed in terms of theoretical accounts of the quantitative/qualitative dichotomy and the importance of working memory attentional resources for intelligence task performance.

**A-0011 ERP correlates of visual short memory quantitative and qualitative change detection performance**

Laura Jenkins, Jahnese Hamilton, Angela Papazian, Libby Orme, Colin Hamilton
Northumbria University, Newcastle-upon-Tyne, UK

The aim of this research was to identify the Event Related Potential (ERP) correlates associated with the Luck & Vogel (1997) quantitative colour change detection task and the qualitative Size JND change detection task (Thompson et al., 2006). In a series of studies, changes in quantitative/qualitative methodology and encoding duration were carried out to investigate the extent to which discrete ERP processes were associated with change detection task behavioural performance. The results suggested changes in both behavioural and ERP components as a function of qualitative/quantitative task and encoding duration manipulation. However, the relationship between the ERP and behavioural measures was less clear. The conclusion will consider the findings in relation to current conceptualisations of change detection task demands.

**A-0015 Feedback processing during emotional learning is controlled by cardiac cycle, interoceptive accuracy and extraversion**

Gaby Pfeifer [1], Sarah Garfinkel [1,2], Cassandra Gould [1], Hugo D. Critchley [1,2]
[1] Clinical Imaging Sciences Centre, Brighton and Sussex Medical School, Brighton, UK [2] Sackler Centre for Consciousness Science, University of Sussex, Brighton, UK

We examined whether the heart influences feedback-processing during learning of emotional faces, with subsequent effects on retrieval. Twenty-nine participants learned face-name pairs (neutral, fearful, happy faces) via trial-and-error. Auditory feedback was delivered at cardiac systole and diastole. Results: fearful, but not neutral and happy, face-name pairs were better learned when feedback was given at systole vs. diastole in individuals with high interoceptive accuracy (measured using the heartbeat counting task). At retrieval, higher extraversion was associated with higher intensity ratings and slower response times to fearful, but not neutral and happy, faces that were initially reinforced at systole. Results suggest that cardiac signals mediate feedback-processing and learning of fearful faces, and are further underpinned by personality differences in arousal.

**A-0016 Aging and synaesthesia provide a window into the functions of sensory and higher cortical areas in working memory**

Gaby Pfeifer [1], Jamie Ward [2,3], Dennis Chan [4], Natasha Sigala [1,2]
[1] Clinical Imaging Sciences Centre, Brighton and Sussex Medical School, University of Sussex [2] Sackler Centre for Consciousness Science, University of Sussex [3] School of Psychology, University of Sussex [4] Department of Neurosciences, University of Cambridge

The sensory recruitment model envisages visual working memory (VWM) as an emergent property that is encoded and maintained in sensory (visual) regions and facilitated by top-down control from prefrontal cortex (PFC). The model implies that synaesthesia, where sensory-perceptual functions are enhanced, entails an efficient VWM-network with reduced activity in visual and PFC; while in old age, when sensory-perceptual functions decline, the effect will be reversed. We tested this model using a novel between-group-design (young grapheme-colour synaesthetes, young and older controls), and achromatic fractal stimuli that do not induce synaesthesia. Supporting the model, synaesthetes showed significantly lower activity in the middle frontal gyrus and in visual regions during two WM-tasks, suggesting greater neural efficiency relative to young and older adults.

**A-0018 Highly exclusive: The unique nature of unitised associations**
Roni Tibon, Richard Henson
MRC Cognition and Brain Sciences Unit, Cambridge, UK
We examined whether episodic binding by unitisation can produce schematic-like neocortical connections that would subsequently facilitate encoding of new information. During an initial Study phase, 24 participants learned pairs of unrelated stimuli using unitisation and non-unitisation manipulations. Next, at Relearning, a studied cue word was re-paired with a new word, either Related or Unrelated to its paired-associate at Study. In a final Test phase, memory for Relearned associations was tested. Unitised and non-unitised associations in the Related condition did not differ, suggesting that unitised links do not generalise to accommodate new information. We did, however, find an unexpected advantage for unitised associations in the Unrelated condition, possibly suggesting that unitised associations are less vulnerable to proactive interference.

**A-0029 Adaptive Mind-Wandering –Thought-Reports Indicate Efficient Rehearsal Strategies in an Interrupted Recall Paradigm**
Lena Steindorf, Jan Rummel
Department of Psychology, Heidelberg University, Heidelberg, Germany
Mind-wandering is mostly studied for its negative effects on ongoing cognitive tasks but may be also of adaptive value. We asked participants to study twenty items for a cued-recall test. After cued recall of ten items, participants were either told that they had finished the recall task or that it was interrupted for another task. All participants then performed a 2-back task during which thought contents were repeatedly probed. Cued recall of the remaining items was better in the interrupted than in the finished condition and this effect was explainable by a more efficient rehearsal strategy: Participants' thought-reports in the interrupted condition revealed a rather continuous rehearsal of study items whereas participants in the finished condition stopped rehearsal early on.

**A-0036 Retrosplenial cortex represents permanence and reliability beyond the spatial domain**
Stephen D. Auger, Eleanor A. Maguire
Wellcome Trust Centre for Neuroimaging, University College London, London, UK
Landmarks which remain fixed in a permanent location in the environment elicit distinct responses in retrosplenial cortex (RSC) during fMRI. However, it is unclear whether this effect is purely spatial or pertains more broadly. Here, while undergoing fMRI scanning, participants read sentences describing landmarks, actions or abstract concepts which were either permanent or transient in nature. RSC specifically responded to sentences involving permanent fixed landmarks (e.g. 'Everybody uses the village post-box') and those involving permanent reliable actions (e.g. 'The chef always creates complex dinners'). Increased RSC-medial temporal lobe functional coupling was also evident for these permanence-related effects. Thus, while making important contributions to spatially mapping environments, RSC might also represent the reliability of events occurring within them.

**A-0037 Spatial-constructive but not semantic-associative scene processing engages the hippocampus**
Cornelia McCormick, Peter Zeidman, Eleanor A. Maguire
Wellcome Trust Centre for Neuroimaging, University College London, London, UK
Neuropsychological and neuroimaging evidence suggests a key role for the hippocampus in scene processing. Here, we probed the nature of its involvement by cueing participants to search for either spatial-constructive (e.g. endless staircase) or semantic-associative (e.g. man casts no shadow) violations in scenes during fMRI. Importantly, most scenes did not contain violations. Hence, during these target trials only the cognitive process differed between the two conditions. The ventral visual stream, including hippocampus, was significantly more engaged during spatial-constructive trials while semantic-associative trials activated lateral temporal and dorsal prefrontal cortices. We conclude that the hippocampus (and wider posterior network), specifically supports spatial-constructive aspects of scene processing, with relevance for recalling the past, future-thinking and navigation.

**A-0038 The effect of physical exercise on memory, a NIRS study**
Blanca Marin Bosch [1], Aurélien Bringard [1], Guido Ferretti [1], Sophie Schwartz [1,2,3], Kinga Igloi [1,2,3]
[1] Department of Neuroscience, Faculty of Medicine, University of Geneva, Switzerland; [2] Swiss Center for Affective Sciences, University of Geneva, Switzerland; [3] Geneva Neuroscience Center, University of Geneva, Switzerland;
Regular physical exercise has been shown to benefit neurocognitive functions, especially enhancing neurogenesis in the hippocampus. However, little is known on the effects of a single exercise session on cognitive functions. To address this issue, we investigated the effect of acute exercise on memory. Healthy young participants performed an associative memory task twice. Each visit consisted of an encoding, an exercise or rest and a test session. We used Near InfraRed Spectroscopy (NIRS) to track changes in oxygenated hemoglobin concentration over the prefrontal cortex. We report a significant increase in performance in the memory task after exercise, compared to after rest. Memory improvement correlated with deactivation over prefrontal regions using NIRS during physical exercise, especially for the most difficult trials.

**A-0042 3D space representation in the human brain**
Misun Kim [1], Kate J. Jeffery [2], Eleanor A. Maguire [1]
[1] Wellcome Trust Centre for Neuroimaging, University College London, London, UK; [2] Institute of Behavioural Neuroscience, University College London, London, UK
The world is three-dimensional (3D), and humans and other animals can move both horizontally and vertically within it. Most previous neuroscientific studies have investigated spatial memory and cognition on a horizontal two-dimensional plane, leaving much unknown about how 3D spatial information is represented in the brain. Here, we addressed the key question of whether the horizontal and vertical dimensions are equally represented in the human brain. We examined fMRI multivoxel responses while participants moved within a virtual 3D grid-like environment. The right anterior hippocampus contained place information that was equally sensitive to the horizontal and vertical axes. These findings suggest that the representation of 3D space within the human brain may be symmetric.

**A-0049 Does age-relate proactive-interference impair navigation?**
Maayan Merhav, Thomas Wolbers.
German Center for Neurodegenerative Diseases (DZNE), Magdeburg, Germany.
Elderly people often report declines in navigational abilities. Additionally, they also are susceptible to proactive-interference; a situation wherein previous learning disrupts the ability to recall more recently presented information. We hypothesized that proactive-interference can cause navigational deficits in aging, whenever spatial information requires updates. To test this, we first tested memory for item-location associations. Half

of the items were presented previously, in different locations ('interfered' condition). Older participants were intact at recalling locations of 'non-interfered' associations, but impaired at recalling 'interfered' ones. Notably, age-related susceptibility to Proactive-Interference was restricted to incidental encoding and did not occur when participants were explicitly instructed to remember locations. Ongoing experiments, using an immersive, virtual environment, will now determine how this age-related Proactive-Interference affects navigation.

**A-0050 Verbal memory and the hippocampus: The role of scenes**

Ian A. Clark, Eleanor A. Maguire
Wellcome Trust Centre for Neuroimaging, University College London, London, UK

Patients with bilateral hippocampal damage are impaired on word-pair associate tests. Accounting for this within extant visuospatial hippocampal theories is challenging. Such tasks typically use imageable words that may evoke scene imagery, which is known to engage the hippocampus and is impaired in patients. We used fMRI to examine the processing of words presented singly or in pairs, matched on a range of variables. Single scene words ('harbour') activated the hippocampus, as did object word pairs ('dragon – crown'), while non-imageable abstract word pairs ('kind – neutral') did not. Scene imagery was also prominent during the two former conditions. These findings may help to reconcile verbal and visuospatial hippocampal functions by revealing the potential importance of scene imagery.

**A-0053 Remembering to Help: Implicitly Priming a Helping Goal Improves Prospective Memory Performance that Benefits Others**

Suzanna L. Penningroth, Tesalee K. Sensibaugh, Angel Muñoz Gómez Andrade, Walter D. Scott
University of Wyoming, Laramie, U.S.A.

Prospective memory (PM) tasks are intentions to be performed. According to the Goal-Based Motivational-Cognitive Model of PM, a PM task that is related to an activated goal will be better remembered. We examined the effect of priming a helping goal on social PM performance (performing intentions that help others). Undergraduates were assigned to three goal priming conditions: implicit helping goal, explicit helping goal, or no goal. Participants performed a computerized PM task by pressing a key whenever clothing items appeared during a word-rating task. For the implicit and explicit goal groups, correct PM responses ("hits") earned money for a charity. Results showed the group primed with an implicit helping goal outperformed both other groups.

**A-0060 Interactive Influence of Biased Retrieval and Retrieval Fluency on Eyewitness Memory Judgments**

Rona Sheaffer, Morris Goldsmith, Ainat Pansky
University of Haifa, Israel

Biased recounting of events can distort one's subsequent memory of those events (Marsh, 2007). Two proposed mechanisms are selective strengthening of retrieved content items, and creation of a biased event schema. Here we show that selective retrieval of event details can actually bias one's event schema in the opposite direction, if the retrieval is experienced as overly difficult. Participants read a murder story and were then asked to recall either 3 (easy) or 9 (difficult) incriminating facts. The heuristic influence of retrieval fluency outweighed the amount of recalled content: Participants recalling nine incriminating facts judged the suspect as less likely to be guilty than those recalling only three. Implications for long-term ease-of-retrieval effects and schema-induced memory bias are discussed.

**A-0061 Implicit and explicit attitudinal consequences of false autobiographical memories and beliefs**

David Howe, Steve Dewhurst, Rachel Anderson
University of Hull, UK

Past research has found that false autobiographical memories and beliefs can result in attitude change, with current data suggesting that false memories and false beliefs are indistinguishable in their attidudinal effects. We extend these findings by investigating whether these effects extend to implicit as well as explicit attitudes. Using an imagination-inflation paradigm, false memories/beliefs of loving a certain food as a child were elicited in a subset of participants. False memories and beliefs both resulted in participants reporting more preferable explicit attitudes towards the relevant food post-manipulation. A novel finding was that only participants who formed a false memory exhibited enhanced implicit attitudes, whilst those who formed a false belief did not differ from controls.

**A-0063 Improving Prospective Thinking in Depression: The Effect of Positive Simulations on Positive and Negative Future Event Appraisals**

Jennifer Boland, Rachel Anderson, Kevin Riggs
University of Hull

Previous research has evidenced that depressed individuals have difficulties with future directed cognitions. For instance, compared with non-depressed individuals, they believe positive events are less likely to occur. Recent work, however, has suggested that episodic simulation of positive future events maybe represent a useful strategy for improving these difficulties in prospection. The current work examined the usefulness of positive future episodic simulation as a method of modifying how individuals appraise positive and negative future events (vividness, likelihood of occurrence, perceived control, and event importance). Data was collected using both non-dysphoric and dysphoric/depressed participants. Results suggest that positive episodic future simulation can improve prospective appraisals and may represent a useful addition to cognitive therapeutic techniques.

**A-0065 The time course of autobiographical memory consolidation**

Daniel N. Barry [1], Martin J. Chadwick [2], Eleanor A. Maguire [1]
[1] Wellcome Trust Centre for Neuroimaging, University College London, London, UK; [2] Institute of Behavioural Neuroscience, University College London, London, UK

Systems-level consolidation theories propose that autobiographical memories are supported initially by the hippocampus, with representations strengthening over time in neocortex. The precise duration of this process is unknown. Here, we used high resolution fMRI and multivariate pattern analysis to examine autobiographical memories, sampling a variety of ages up to two years old, along with remote memories that were five years old. Memories ranging in age from one to five years were more strongly represented in ventromedial prefrontal cortex compared to those which were less than a year old. By contrast, memories were equivalently represented in the hippocampus irrespective of remoteness. These findings highlight the first year following acquisition of autobiographical memories as significant for their stabilisation in neocortex.

**A-0068 Using the environment to support working memory performance**

Ed Berry, Richard Allen, Mark Mon-Williams, Amanda Waterman
University of Leeds, Leeds, UK

Working memory is central to navigating the demands of the classroom environment, from solving maths problems to following instructions. An important aspect of many environments, such as classrooms, is the way they can be used to cue and constrain cognition. By making 'intelligent' use of the environment we can make complex tasks more tractable. In Study 1 83 children (mean age = 10.33 years) completed a span task with coloured blocks in ordered and pseudorandom arrangements. Overall span was higher when the blocks had an ordered arrangement. This effect was especially pronounced for children with low working memory. In Study 2 children's insight into this effect was explored, with possible implications for working memory theory and educational practice.

**A-0069 Comparing scene construction and associative processing in the hippocampus**

Marshall A. Dalton, Peter Zeidman, Cornelia McCormick, Eleanor A. Maguire
Wellcome Trust Centre for Neuroimaging, University College London, London, UK

Whether the hippocampus is required for making arbitrary associations between items or is specifically concerned with constructing spatially coherent scenes is debated. Using high resolution fMRI we compared these two theories using a novel mental imagery paradigm. Participants imagined three objects either on a three-dimensional plane (scene construction) or arbitrarily placed on a two-dimensional plane (array construction). Thus the conditions were matched for content and task requirements. During scene construction, anterior medial hippocampus and parahippocampal cortex were recruited. By contrast, array construction activated entorhinal and perirhinal cortices. These findings point to scene construction rather than associative processing per se as a function of anterior medial hippocampus with significance for navigation, recalling past experiences and imagining the future.

**A-0070 Primacy Recall and Attention: an Eye Tracking study**

Davide Bruno [1,2], Simon Preece [1], Glen Pennington [1], Dan P. A. Clark [1]
[1] Liverpool Hope University, UK; [2] Liverpool John Moores University, UK

The primacy effect in free recall has been linked to rehearsal opportunities, but also to increased attention, and has been shown to predict subsequent cognitive decline in healthy elderly individuals (e.g., Bruno et al., 2013). The current study used the eye tracker to test the claim that primacy effects benefited from increased visual attention. Twenty-four undergraduate participants were presented visually with a list of 15 nouns, appearing one at a time, and were then given a free recall test. A two-minute delay took place between study and test. Results show that although fixation duration did not mimic the serial position curve, it was positively associated with primacy performance, thus suggesting that increased attention plays a role in the primacy effect.

**A-0075 Metamemory and the Benefit of Generating Errors**

Chunliang Yang, David R. Shanks
Division of Psychology and Language Sciences, University College London, London, UK

Errorful generation can enhance retention more effectively than does reading. Nonetheless, people tend to be unaware of this benefit. In the first two experiments reported here, lower judgements of learning (JOLs) were consistently made for incorrectly generated targets, despite the fact that they were subsequently remembered better. Importantly, this unawareness lead participants to allocate more study resources (restudy choices in Experiment 1 and restudy time in Experiment 2) to incorrectly generated targets. In Experiment 3, with the delayed JOLs, this unawareness was countered and more Read pairs were selected to be restudied. The current experiments reveal that people tend to be unaware of the benefit of errorful generation and this unawareness can lead to irrational study resource allocation.

**A-0087 Time Manages Interference in Visual Short Term Memory**

Amy Victoria Smith, Denis McKeown, David Bunce
School of Psychology, University of Leeds, Leeds, UK

In a continuous visual recognition task, where a sequence of pictures of everyday objects is presented, participants report whether an item is 'old' (previously presented), 'new' (novel item) or 'similar' (the item is nearly identical to one previously presented). In this present study we were interested in failures in 'similar' responding in older age groups (> 65 years) for this may reflect difficulty in consolidating visual information into memory. By extending the inter-item intervals, number of intervening items, and overall decay interval (time between old and similar items) we observed that the critical factor governing performance was inter-item interval. We argue this reflects benefits of consolidation of visual information into immediate memory, offering protection from inter-item interference.

**A-0089 Can color cues increase toddlers' spatial memory? A study on object permanence involving the rotation of hidden objects**

Mirjam Ebersbach [1], Christian Nawroth [2]
[1] Universität Kassel, Germany [2] University of London, UK

Sophian (1984) assumed that only from 3.5 years on, children are able to find hidden objects whose hiding location has been transposed. However, recent research suggests that children's performance might depend on the type of transposition and the discriminability of the hiding locations. In the current study, 2.5-year-olds searched for an object hidden under one of two identically or differently colored cups that were rotated by 90° or 180°. Children searched more successfully in the 90° condition compared to 180°. Discriminability of the cups affected their success rate only in the 180° condition, where they performed above chance level with differently colored cups – but not with identical cups. Results are discussed in light of the development of spatial memory.

**A-0111 Examining the phenomenology and functions of episodic memories, counterfactual thoughts and future simulations**

Müge Özbek, Annette Bohn, Dorthe Berntsen
Center on Autobiographical Memory Research (CON AMORE), Department of Psychology and Behavioural Sciences, Aarhus University

Recent research examined similarities and differences between mental time travel into the past and future. Episodic counterfactuals have been understudied compared to episodic memories and future simulations. Here, phenomenology as well as functions (Harris, Rasmussen, & Berntsen, 2013) of the most important episodic memory, counterfactual thought, and future simulation were compared in 60 undergraduates (48 women and 12 men; M age = 21.10, SD age = 1.51). Results showed that people remember past events with clarity, imagine alternatives to past events (counterfactual thoughts) with lower emotional intensity, and imagine the future most positively. Moreover, a heightened ruminative use of counterfactuals is evident, although reflective and social uses are prominent for all events.

**A-0114 Segregating Active Inhibition from Passive Awareness Control in Suppression-induced Forgetting**

Yuhua Guo [1,2], Michael C. Anderson [1,2]
[1] MRC Cognition and Brain Sciences Unit, Cambridge, UK; [2] University of Cambridge, Cambridge, UK

How does the intention to forget influence memory inhibition? This study compared two novel versions of the Think/No-Think paradigm with the standard version to segregate active inhibition (the 'Forget' version) from passive awareness control without the intention to forget (the 'Suspend' version) in suppression-induced forgetting (SIF), a reduction in recall after practice of retrieval suppression. The extent of SIF was assessed with both the same-probe (SP) and independent-probe (IP) tests. Forget instructions yielded significant SIF effects on both tests, which are stronger than those in the other versions that did not explicitly encourage forgetting. These results indicate that explicitly encouraging active forgetting during retrieval suppression practice may generate more robust SIF effects in both cue-dependent and cue-independent recall.

**A-0115 Response Theory analyses of the Reading Decision Test- Brazilian version**

Mônica Carolina Miranda [1], Alan Baddeley [2], Elayne C. M. Pinheiro [1], Ana Luiza Navas [3], Thais Barbosa [1], Orlando F. A. Bueno [1]
[1] Universidade Federal de São Paulo, São Paulo, Brazil [2] University of York, York, North Yorkshire, England [3] Faculdade de Ciências Médicas da Santa Casa de São Paulo, São Paulo, Brasil

Reading competency involves complex processes concerning several abilities, such as language processing (phonological, semantic, pragmatics), working memory and long-term memory. The Reading Decision Test (RDT) was developed by Baddeley, Gathercole & Spooner (2003) and adapted to Brazilian Portuguese by Pinheiro (2011), aims to assess the decoding and comprehension processes. This study provides the construct validity and invariance testing for gender, type of school [private/public], and grade [first to fifth grade] for two RDT forms of letter and words subtests, under a Bayesian confirmatory factor analysis in a sample of 487 children equally distributed across the five grades. The models for both tasks and versions showed a good fit after few items exclusion and full scalar invariance for all tested groups.

**A-0118 The effect of rehearsing an alibi on memory detection**

Phot Dhammapeera [1], Xiaoqing Hu [2], Zara Bergström [1]
[1] University of Kent, UK; [2] University of Texas, USA

We examined whether rehearsing a fake alibi for a crime would make suspects appear innocent in a reaction time test for determining criminal guilt, the Autobiographical Implicit Association Test (aIAT). Recent research has found that faking an alibi weakened an original crime memory so that it was less likely to be detected by polygraph measures. Our preliminary results indicate that practicing a fake alibi also helps guilty suspects evade detection on the aIAT. Mentally simulating a counterfactual past event may reduce implicit associations between the veridical memory and the truth, which is problematic for real-life applications of memory detection with uncooperative, lying suspects.

**A-0122 Reactivating emotional memories during REM and NREM sleep**

Mick Lehmann [1,2,3], Thomas Schreiner [4], Erich Seilritz [1,3], Björn Rasch [3,4]
[1] Psychiatric University Hospital Zürich, CH [2] University of Zürich, CH [3] Clinical Research Priority Program Sleep and Health, CH [4] University of Fribourg, CH

Rapid eye movement (REM) sleep is assumed to preferentially reprocess emotional memories. Here we tested this hypothesis by experimentally reactivating emotional and neutral memories during REM and NREM sleep by presenting associated verbal memories cues during sleep. Contrary to our hypothesis, reactivation during both REM and NREM sleep improved memory for emotional pictures, and this effect was even more robust during NREM sleep. Furthermore, oscillatory correlates of successful memory reactivation during NREM sleep (i.e. increases in theta and spindle oscillations) differed only quantitatively, but not qualitatively between emotional and neutral memories. Our data suggests that instead of initiating preferential reprocessing during REM sleep, emotions during encoding rather modulate general consolidation processes of declarative memories occurring during NREM sleep.

**A-0123 The Electrophysiology of Familiarity and Recollection**

Syanah Wynn, Dennis Schutter, Sander Daselaar, Marc Hendriks, Roy Kessels
Radboud University Nijmegen, Donders Institute

Recognition memory can be thought of as consisting of two processes, familiarity and recollection. Familiarity is responsible for recognition without context, while recollection is responsible for recognition with context. Since little is known about the electrophysiology of these processes, the aim of this study was to isolate ERP components and EEG oscillations involved in familiarity and/or recollection. We recorded EEG during a verbal memory task. In the encoding phase of the memory task, participants had to make a pleasantness judgment regarding the presented word. In the retrieval phase participants had to make a recognition-based old/new judgment followed by a confidence judgment. The results of this exploratory study will contribute to the disentangling of neuronal processes related to familiarity and recollection.

**A-0140 The effect of variable input on memory for novel vocabulary**

Nichole Runge, Mitchell S. Sommers, Joe Barcroft
Washington University in St. Louis, Saint Louis, USA

Vocabulary learning typically requires mapping a novel word form to its meaning. Previous research has found that word-form variability, realized by the use of multiple talkers compared to a single talker, improves memory for novel second-language words (Barcroft & Sommers, 2005). The present research was designed to investigate whether semantic variability as realized through the use of differently worded definitions could have a similar beneficial effect on definition memory. Half of the words were presented with the same definition at each of the six exposures, while the other half were shown with a synonymous, but differently worded, definition at each exposure. We found that participants correctly recalled more definitions from the variable compared to the constant definition condition.

**A-0147 Perceptual and semantic properties both modulate the ERP correlate of familiarity**

Fabrice Guillaume, Sophie Tinard, Mélanie Bourgeois
Laboratoire de Psychologie Cognitive (CNRS, UMR 7290), Marseille, France

Format change and semantic relatedness effects were investigated in a recognition task of word-line drawing pairs while event-related potentials (ERPs) were computed. Format change describes the switch from the verbal form to the line drawing form of an item, and reciprocally. It was cross-manipulated with semantic relatedness (related: rabbit-carrot; unrelated: duck-pineapple). Higher hit rates, larger FN400 (300-500ms) and parietal old-new (500-800ms) effects were observed in the same compared to the different format condition but also for related than unrelated pairs. These results suggest that the FN400 old-new effect generally interpreted as a correlate of familiarity can be modulated by the associative properties of the pairs in the same way that the parietal old-new effect related to recollection.

**A-0148 Transcranial stimulation of the dorsolateral prefrontal cortex prevents stress-induced working memory deficits**

Mario Bogdanov, Lars Schwabe

University of Hamburg, Germany
Stress is known to impair working memory performance, presumably by decreasing the activity of the dorsolateral prefrontal cortex (dlPFC). In the present experiment, we tested whether transcranial direct current stimulation (tDCS) of the dlPFC can prevent stress-induced working memory impairments. We tested 120 healthy participants in a two-day, sham-controlled, double-blind between-subject design. Participants were exposed to either a stress or a control manipulation before they performed two working memory tasks. During these tasks, anodal, cathodal or sham tDCS was applied over the right dlPFC. Stress impaired working memory performance in both tasks. This stress-induced impairment was prevented by anodal, but not sham or cathodal stimulation. Our findings indicate a causal role of the dlPFC in working memory impairments after stress.

**A-0151 Individual Differences in Autobiographical Forgetting in Old Age across Five Years**

Tabea Wolf, Daniel Zimprich
Ulm University, Ulm, Germany
Memories lose accessibility with the passage of time. Although the mechanisms underlying forgetting may be the same, the amount or rate of forgetting may differ between individuals. Research on episodic memory suggests that individual differences in forgetting are strongly related to basic cognitive abilities (e.g., processing speed, working memory). We currently examine whether individual differences in basic cognitive abilities also account for individual differences in autobiographical forgetting. In focusing on autobiographical memory, we also consider personality (e.g., Openness to Experience) a promising predictor variable. Analyses will be based on data from the Interdisciplinary Study on Adult Development in which 492 older adults aged between 64 and 69 years reported autobiographical memories from the past five years of their lives.

**A-0162 Memory control ability modulates intrusive memories after analogue trauma**

Markus Streb [1], Axel Mecklinger [2], Michael C. Anderson [3,4], Johanna Lass-Hennemann [5], Tanja Michael [5]
[1] Division of Clinical Psychology and Psychotherapy, Department of Psychology, University of Freiburg, Freiburg, Germany; [2] Experimental Neuropsychology Unit, Department of Psychology, Saarland University, Saarbrucken, Germany; [3] MRC Cognition and Brain Sciences Unit, Cambridge, United Kingdom; [4] Behavioural and Clinical Neurosciences Unit, University of Cambridge, Cambridge, United Kingdom; [5] Division of Clinical Psychology and Psychotherapy, Department of Psychology, Saarland University, Saarbrucken, Germany
This study tested the hypothesis that individual differences in memory retrieval suppression predict intrusive memories after trauma. Retrieval suppression was examined with the think/no-think task (TNT) using behavioral and event related potential (ERP) measures. Twenty-four healthy participants watched a traumatic film after performing the TNT. The frequency and distress of intrusions from the traumatic film was measured with an electronic diary and a clinical questionnaire. In line with our hypothesis, behavioral measures of retrieval suppression ability predicted reduced distress ratings for intrusions (r=.53, p

**A-0173 The effects of acute stress on emotional working memory and its associated functional brain connectivity**

C.W.E.M. Quaedflieg [1,2], L. Schwabe [1], I. Timmers [2], P. Mania [1], T. Smeets [2]
[1] University of Hamburg, Hamburg, Germany; [2] Maastricht University, Maastricht, The Netherlands
Stress-related disorders such as depression and PTSD are characterized by a susceptibility to emotional distraction and working memory deficits. We investigated gender differences in the impact of stress on emotional working memory (EWM) and its neuronal correlates. Using the imaging Maastricht Acute Stress Test we induced acute stress in 39 healthy volunteers in a Siemens 3T-fMRI scanner. Ten minutes after stress induction, participants performed the EWM task. Cortisol and salivary Alpha-Amylase were measured before and after the EWM task. We hypothesized that stress in general impairs EWM and that individuals with higher EWM under stress are characterized by higher functional connectivity of the prefrontal cortex with the amygdala. Results of Psychophysiological Interaction (PPI) analyses will be presented.

**A-0180 Suggestibility to Additive versus Contradictory Misinformation Following Explicit Error Detection in Younger and Older Adults**

Sharda Umanath [1], Mark J. Huff [2], David A. Balota [2]
[1] Claremont McKenna College, Claremont, USA; [2] Washington University in St. Louis, St. Louis, USA
After reading a fictional story, participants answered related questions containing misleading details that were either additive (not originally included) or contradictory (a change to the original). Prior to these misleading questions, participants were either warned about these errors, instructed to mark any detected errors, or were not warned. On a final test, we then assessed suggestibility. Additive misinformation was endorsed much more frequently than contradictory; however, suggestibility to contradictory misinformation was reduced when participants had been warned beforehand. Older adults detected both types of misleading details more often. Interestingly, they then showed similar suggestibility to additive misinformation but reduced suggestibility to contradictory misinformation. Thus, older adults' greater misinformation detection was only protective when misinformation was discrepant to the original story.

**A-0188 Interference in scalar short-term memory**

Tyler D. Bancroft[1], Philip Servos[1], Tyler M. Ensor[1,2], Jeffery A. Jones[1], William E. Hockley[1]
[1] Wilfrid Laurier University, Waterloo, Canada [2] Memorial University of Newfoundland, St. John's, Canada
The negative effects of distraction on working and short-term memory may be due to the intrusion of irrelevant information into memory. While previous research has reported greater interference when distractors are similar to the contents of memory than vice versa, research using very simple stimuli has found a different pattern of results (e.g., Bancroft & Servos, 2011; Bancroft, Servos, & Hockley, 2011). In the present study, using auditory pure tones as stimuli, we found that the more similar a distractor frequency is to a probe frequency (not to the contents of memory), the greater the detriment to performance and vice versa, suggesting that probes are being compared against distractors, consistent with the intrusion of distractors into memory.

**A-0195 The effect of the Biased Retelling of a harsh experience on Autobiographical Memory Characteristics and Post Traumatic Growth**

Kazuhiro Ikeda[1], Yayoi Kawasaki [2]
[1] Shokei Gakuin University, Miyagi, Japan; [2] Nihon University, Tokyo, Japan
We examined whether the positive biased retelling increased the positive belief for a harsh memory and elicited the Post Traumatic Growth (PTG). Two hundred twenty undergraduate students were asked to answer the retelling style that they have used most frequently when they talked about their harsh memories, and to rate following memory characteristics questionnaires and the PTG questionnaires: (1) Subjective properties questionnaire of autobiographical memory, (2) Centrality of Event Scale, (3) Meaning making in memory, (4) Intrusive items for Event Related Rumination Inventory (ERRI), (5) Deliberate items for ERRI, (6) Core Beliefs Inventory. The result revealed that they decreased negative emotion, facilitated the meaning making, and activated the PTG when they retold a negative memory as a positive one.

**A-0208 Imaging memory transformation: neural signature of detailed and gist-like memories of recent and remote events**
Lisa Dandolo, Lars Schwabe
Institute of Psychology, University of Hamburg, Hamburg, Germany
During consolidation memories are thought to undergo a transformation from detailed, episodic to more gist-like, semantic representations. The current experiment tested the transformation of memories and its neural basis in healthy humans. Participants encoded neutral or emotionally negative pictures and performed a recognition test in the scanner either 24h or 28d later. Critically, in the recognition test participants saw the original pictures, entirely new pictures as well as new pictures carrying the gist of the original ones. We predict that participants will show more false alarms for similar pictures after 28d than after 24h and that the specificity of memory will depend on the involvement of the hippocampus. Data are currently being analyzed and will be presented at the meeting.

**A-0211 The action-sentence compatibility effect (ACE): Implications for long-term memory**
Antonio M. Díez [1], Emiliano Díez [1,2], María A. Alonso [2,3], Arthur M. Glenberg [4], Angel Fernandez [1,2]
[1] Universidad de Salamanca, Spain; [2] Instituto Universitario de Integración en la Comunidad INICO, Salamanca, Spain; [3] Universidad de La Laguna, Spain; [4] Arizona State University, Tempe, AZ, USA
Recent studies suggest that language comprehension implies constructing sensorimotor simulations of the events described in sentences. Glenberg and Kaschak (2002) found that comprehending a sentence that implies action away or towards the body interferes with making a sensibility judgment that requires responding with an action in the opposite direction (the action-sentence compatibility effect: ACE). An experiment was conducted to further examine the ACE and its implications for long-term memory. The 2-phase procedure included a replication of the ACE paradigm (Phase I) and a subsequent unexpected recognition test on studied sentences (Phase II). An ACE was obtained in Phase I, but the interference created by incompatible actions while reading did not affect memory for the sentences in Phase II.

**A-0214 Incidental memory for highly detailed natural scenes**
Rose Wastling, Denis McKeown, Charity Brown, Richard Allen, David Bunce
University of Leeds, Leeds, UK
In order to understand incidental or passively encoded visual scene memory, participants were shown 80 everyday highly detailed scene images, making simple aesthetic ratings rather than attempting to memorise. Following a delay (from minutes to days) they viewed 5 same-category target images in succession, followed by a probe image that either matched one of the five just presented or it did not. Crucially, on a third of the trials the probe image was one of the original 80 images that participants had previously rated. Supporting the notion of a memory trace for scenes that endures over several days, across two experiments the findings suggested that recent-stimulus trial responding was faster to previously viewed probes than to novel probes.

**A-0230 The Cognitive Interview: New procedures to enhance witnesses' report and evaluate report accuracy**
Rui Paulo [1], Pedro B. Albuquerque [1], Ray Bull [2]
[1] School of Psychology, University of Minho; [2] School of Law and Criminology, University of Derby
The Cognitive Interview (CI) is a well-known method to interview witnesses. However, finding further ways to enhance witnesses' report is crucial. We focused on enhancing recall with a new strategy, Category-Clustering-Recall (CCR), and evaluating report accuracy. Participants viewed a mock robbery and were interviewed with the CI, or the revised CI, with CCR instead of Change Order mnemonic. Retrieved information was classified as 'certainty' ('I'm sure he jumped'), 'uncertainty' ('I think he jumped'), or 'regular recall' ('He jumped'). CCR elicited more information without compromising accuracy. 'Certainties' were more accurate than 'uncertainties' and 'regular recall'. 'Uncertainties' were less accurate than 'regular recall'. CCR is an effective procedure and differentiating 'certainties' and 'uncertainties' are efficient time-saving procedures to evaluate report accuracy.

**A-0232 Acute stress improves event-based and time-based prospective memory performance in young adults**
Ágnes Szőllősi [1], Péter Pajkossy [1,2], Gyula Demeter [1,2], Szabolcs Kéri [1,3], Mihály Racsmány [1,2]
[1] Department of Cognitive Science, Budapest University of Technology and Economics, Budapest, Hungary; [2] Research Group on Frontostriatal Disorders, Hungarian Academy of Sciences, Budapest, Hungary; [3] National Institute of Psychiatry and Addictions, Nyírő Gyula Hospital, Budapest, Hungary
Although a long line of studies showed that acute stress affects memory, interestingly, the possible relationship between stress and the maintenance of future-related actions and intentions (prospective memory, PM) is relatively understudied. Participants (young adults) were exposed to either a stress-inducing task (Socially Evaluated Cold Pressor Test) or a control procedure followed by three computer-controlled PM paradigms. In the event-based PM tasks, stressed subjects responded to the PM cues faster than controls. In the time-based task, stressed subjects checked the time counter clock less frequently than controls, i.e., they performed the task as successfully as the control participants but without extra monitoring behavior. Our results suggest that acute stress improves performance when individuals execute planned actions and intentions.

**A-0233 When do Older Adults Show a Positivity Effect in Emotional Memory ?**
Clémence Joubert [1], Patrick S. R. Davidson [2], Hanna Chainay [1]
[1] Laboratoire d'Étude des Mécanismes Cognitifs, Université Lumière Lyon 2, Lyon, France [2] School of Psychology, University of Ottawa, Ottawa, Ontario, Canada
Typically, emotional items are easier to remember than neutral ones. Charles, Mather, and Carstensen (2003) reported that older adults preferentially remember positive items, but this "positivity effect" has not been replicated consistently. We examined two factors (attention and lifespan time perspective) that have been argued to influence its presence. In Experiment 1, older adults showed a positivity effect only under full attention. In Experiment 2, a priming task preceded the memory task, to invoke thoughts about aging and limited lifespan. Only young people showed a hint of a positivity effect. Results suggest that the positivity effect in older adults' memory is attributable in part to cognitive control during encoding, but is highly sensitive to the goals of the participants themselves.

**A-0235 Valence-specific effects of confidence in visual processing regions and the MTL for true and false memories**
Sarah M Kark, Elizabeth A Kensinger
Department of Psychology, Boston College, Chestnut Hill, USA
The effects of emotional valence on the processes linked to true and false memories have not been thoroughly investigated. Here, parametric analyses were used to examine how BOLD activity tracked with confidence in a true or false memory. Collapsing across valences, true memory

confidence was associated with activity in the fusiform gyrus while false memory confidence was associated with dorsomedial and ventrolateral prefrontal activity. Within the hippocampus and inferior temporal gyrus, a valence-by-memory interaction demonstrated a stronger link to true memory confidence for negative memories but a stronger link to false memory confidence for positive memories. These findings highlight that emotional valence can affect how medial temporal-lobe and sensory regions relate to the phenomenological experience of true and false memories.

**A-0245 You are less significant because I forgot you: forgetting leads to devaluation of faces**

Masanori Kobayashi, Jun Kawaguchi
Nagoya University, Nagoya, Japan

Perceived affective values of faces (e.g. attractiveness) typically affect their memorability. It remains unclear whether availability of faces in memory influences their affective values. Therefore, we investigated whether forgetting leads to devaluation of faces in two experiments. Participants rated the attractiveness of faces, followed by studying the faces with the their ratings. Then, participants took a choice recognition test and finally recalled ratings of the faces. The results indicated that differences between actual ratings and recalled ratings for forgotten faces were lower than that for remembered faces. Furthermore, this devaluation effect was only obvious for the faces with high ratings when metacognitive awareness about availability of face memory was reduced. These findings suggest that forgetting leads to devaluation of faces.

**A-0246 A memory signature - Reinstatement of brain activity patterns for episodic memory retrieval over the course of one week**

Christiane Oedekoven, James Keidel, Samuel Berens, Chris Bird
School of Psychology, University of Sussex, Brighton, UK

We investigated the stability of memories for lifelike events over one week using functional MRI. Participants watched and retrieved 24 videos and retrieved the videos again after a week. Representational similarity analyses identified a pattern of brain activity specific for each video centering on precuneus, which was similar at immediate and delayed retrieval. In a partially overlapping network which included hippocampus, the reinstatement of pattern of brain activity correlated with the amount of details recalled. The fact that the brain activity pattern of a specific video can be detected after a week in a widespread memory network supports Multiple Trace Theory which highlights the role of memory reinstatement in hippocampal and distributed cortical regions in maintaining detailed episodic memories.

**A-0248 [Day]dreaming predicts dart throwing performance**

Caroline Horton, Ethan Miller
[1] Bishop Grosseteste University, Lincoln, UK; [2] Leeds Beckett University, Leeds, UK

We explored offline memory consolidation in daydreaming as a function of procedural learning. 24 participants (mean age 27; 16 males, 8 females) had three attempts to throw a dart, completed a daydreaming diary for a week, then completed the dart task again a week later. All participants improved in the dart throwing task. Daydreaming frequency, as measured by the questionnaire measures, did not affect dart throwing improvement ($p>.05$). However correlations were found between task relevance of daydreams, and similar motor representation, and extent of improvement. Indeed task relevance accounted for 14%, and motor representation accounted for 40%, of variance in scores. Results tentatively suggest that some qualities of daydreaming could relate to procedural learning by supporting memory consolidation.

**A-0249 The effects of emotional arousal on memory-guided attention**

Nilgun Turkileri, David Field, Judi Ellis, Michiko Sakaki
School of Psychology and Clinical Language Sciences, University of Reading, Reading, UK

The current study aims to investigate how emotional arousal affects memory-guided attention. Participants were asked to learn the locations of a small gold key (target) embedded within natural scenes during a training session and completed a test session on a following day. During test phase, participants were first presented with a fear-conditioned tone (CS+) or a neutral tone (CS-), followed by a brief presentation of a scene. They were asked to indicate whether the scene included the target. Results indicated that arousal induced by CS+ slowed reaction times only when participants did not have a valid memory of the location of the target from the training session. These results suggest that arousal modulates how our attention is guided by memory.

**A-0250 Sleep and directed forgetting: The role of napping in the consolidation of relevant and irrelevant memories**

Borbála Blaskovich [1], Ágnes Szőllősi [1], Ferenc Gombos [2], Mihály Racsmány [1,3], Péter Simor [1]
[1]Department of Cognitive Science, Budapest University of Technology and Economics,Hungary; [2]Pázmány Péter Catholic University, Budapest, Hungary; [3] Frontostriatal System Research Group, Hungarian Academy of Sciences, Hungary

In the current research we aimed to manipulate the perceived relevance of memory elements and examined the effects of daytime naps on memory performance within the frames of a list-method directed forgetting paradigm. Traditional EEG was used to monitor the naps. Our data indicated a significant directed forgetting effect after two-hour delay in both groups (nap, wake). Furthermore the sleep microstructure analyses indicated a positive association between the spectral power of parietal sigma (13-16 Hz) activity and the recall of the elements of the to-be remembered (relevant) word list within the forget subgroup. This result could support the assumption that sigma activity during an afternoon nap could play a prominent role in the enhancement of newly acquired, relevant information.

**A-0252 Introducing a new mnemonic to the timeline technique: retrieval support for sub-optimally encoded events**

Feni Kontogianni [1], Lorraine Hope [1], Paul J. Taylor [2], Aldert Vrij [1], Fiona Gabbert [3]
[1] University of Portsmouth, UK; [2] University of Lancaster, UK; [3] Goldsmiths University of London, UK

The timeline technique, which uses an innovative reporting format to elicit information about witnessed events, enhances the reporting of person-action details. The current study extends the timeline methodology with the addition of a novel and theoretically-informed mnemonic, the use of self-generated cues (SGC). We also investigate the facilitating properties of the SGC compared to mental reinstatement of context (MRC) and no mnemonics (control) for optimally and sub-optimally encoded events. One hundred and thirty-two participants witnessed a multi-perpetrator crime event under full or divided attention and were asked to provide their account. Across timeline reporting conditions, participants were also given instructions of SGC, MRC, or no mnemonics. Results have implications for autobiographical memory organization at retrieval and eliciting information contexts.

**A-0256 Neural correlates of selective memory retrieval in episodic memory**

Michael Wirth, Bernhard Pastötter, Karl-Heinz T. Bäuml
Regensburg University, Regensburg, Germany

Selective retrieval of a subset of studied items impairs recall of the remaining items when at test study context access is maintained, but improves

recall when study context access is impaired (Bäuml & Samenieh, 2010). While the detrimental effect of selective retrieval has been studied exhaustively in recent years, not much is yet known about the beneficial effect. This study investigated the neural processes underlying the beneficial effect utilizing oscillatory EEG analyses. The results point towards two distinct processes mediating the beneficial effect, one process working on a context level and the other process working on an item level. The results strengthen the view that the beneficial effect of selective retrieval is mediated by context reactivation processes.

**A-0257 When selective retrieval improves recall of other memories: direct evidence for context reactivation processes**

Karl-Heinz Bäuml, Lisa Wallner
Universität Regensburg, Germany

Selective retrieval of some studied items can improve recall of other items when at test access to the study context is impaired. Corresponding evidence arose when using directed forgetting, context-dependent forgetting, and time-dependent forgetting to impair study context access (Bäuml & Schlichting, 2014). Employing prolonged retention intervals between study and test, we replicated this beneficial effect. In particular, we showed that the effect disappears when study context is mentally reinstated before the test. Moreover, under such conditions, detrimental effects of selective retrieval arose, mimicking findings from other work, which showed that selective retrieval impairs recall of other items when study context access is maintained. Results provide direct evidence that context reactivation processes mediate the beneficial effect of selective memory retrieval.

**A-0261 Priming of related concepts during future imagining**

Karen L. Campbell, Roland G. Benoit, Daniel L. Schacter
Harvard University, Cambridge, USA

Recent work suggests that autobiographically significant concepts (e.g., certain famous names) automatically activate associated details in episodic memory (Renoult et al., 2014). The present study asked whether a similar process of spreading activation is also implicated during future imagining of autobiographically significant (and personally familiar) concepts. To this end, we had participants generate a list of familiar places and for each place, the people they most strongly associate with it. A week later, participants imagined future events involving recombinations of people and places, immediately followed by a measure of implicit access to related (yet unseen) names. Our results show that related concepts are automatically activated during future imagining, suggesting yet another parallel between remembering the past and imagining the future.

**A-0265 Extending the Self into the Future: Age Doesn't Matter**

Sinué Salgado, Dorthe Berntsen
Center on Autobiographical Memory Research, Aarhus University, Denmark

This study examined the temporal distribution of future self-images generated by a large representative sample of Danish adults from 18 to 70 years of age. Although previous research has shown a strong negative correlation between future time perspective and age; our results showed that participants concurred on a surprisingly short future horizon, dating their future self-images within the first five to ten years from their present, irrespective of any demographic factor. The findings are in accordance with temporal construal theory and suggest that future self-images might serve an adaptive emotional and behavioral self-regulatory function regardless of age. The findings are discussed in a life span developmental perspective.

**A-0266 Medial temporal lobe damage impairs short-term memory for high-resolution associations**

Joshua D. Koen [1], Alyssa A. Borders [2], Michael T. Petzold [2], Andrew P. Yonelinas [2]
[1] University of Texas at Dallas, USA, [2] University of California, Davis, USA

Although there is growing evidence that the MTL supports processes necessary for short-term memory (STM), the conditions in which the MTL is necessary for STM remain elusive. One proposal is that the MTL, particularly the hippocampus, is necessary when STM requires remembering complex, high-resolution associations. This hypothesis was tested in the current study by assessing visual STM for high and low resolution associations in patients with MTL damage. The results demonstrated that larger impairments in STM for high-resolution relative to low-resolution associations in patients with MTL damage, even when overall task difficult was equated. The results provide evidence consistent with the proposal that MTL plays an important role in supporting high-resolution associative binding.

**A-0267 Strategic regulation and reporting in the alibis of innocent and guilty suspects**

Shiri Portnoy [1], Lorraine hope [1], Aldert Vrij [1], Pär-Anders Granhag [2], Karl Ask [2]
[1] University of Portsmouth, Portsmouth, UK; [2] University of Gothenburg, Gothenburg, Sweden

Alibis provided by truth-teller suspects often fail to convince investigators of their innocence. To promote the generation of credible alibis by truth-tellers, we examined the effect of different pre-alibi instructions on alibis provided by innocent vs. guilty suspects. Drawing on Koriat and Goldsmith's (1996) model of strategic regulation of memory accuracy, innocent and guilty participants provided an alibi (for an apparent theft) that emphasized the accuracy or informativeness of the reported information, both, or none. Alibi quality and quantity are expected to be highest for innocent participants instructed to provide accounts that are both accurate and informative. Results will inform interviewers how best to maximize the memory output of innocent suspects through the use of pre-alibi instructions.

**A-0269 What's age got to do with it? Age, accuracy, metamemory and the social contagion of false memories.**

Katya Numbers [1], Amanda Barnier [1], Michelle Meade [2], Henry L. Roediger III [3]
[1] ARC Centre of Excellence in Cognition and its Disorders, and Department of Cognitive Science, Macquarie University, Sydney, AU. [2] Montana State University, Montana, USA; [3] Washington University in St. Louis, Missouri, USA.

We examined the influence of confederate accuracy and age on the social contagion of false memories in older adults (M = 74.59). Participants recalled previously viewed household scenes with a younger (23-years) or older (77-years) confederate who suggested no (0%), some (33%) or only (100%) false items for different scenes. We also measured participants' attitudes regarding ageing and their own memory ability (metamemory) to see if these beliefs predicted actual performance. Contrary to other social contagion studies (Davis & Meade, 2012), our older adults did not discount a same-aged partner; meaning participants adopted the same amount of false information from younger and older confederates. Older participants' metamemory scores were, however, related to the magnitude of the contagion effect.

**A-0271 Recollection versus familiarity in normal aging and in mild cognitive impairment: Impact of test format.**

Jessica Simon [1], Jessica Gilsoul [1], Eric Salmon [1,2], Christine Bastin [1]
[1] University of Liège, Liège, Belgium; [2] CHU of Liège, Liège, Belgium

The aim of this study was to investigate the impact of test format on recollection and familiarity in normal aging and in MCI. Seventy young

participants, 65 younger-old, 53 older-old, and 13 MCIs were presented with forced-choice and yes/no visual recognition memory tasks with the Remember/Know/Guess paradigm. The young people had better recognition performance than younger-old, who performed better than older-old and MCIs. Recollection and familiarity declined progressively in healthy aging. In MCI, recollection was more affected than familiarity, but patients demonstrated a more liberal use of familiarity. Finally, test format did not influence strongly the results. Young people used recollection more often in the forced-choice task compared to the yes/no task.

**A-0272 Schema-driven inference learning: testing the impact of concurrent glucocorticoid and noradrenergic activation**

Lisa Marieke Kluen, Lars Schwabe
Department of Cognitive Psychology, Institute of Psychology, Von-Melle-Park 5, University of Hamburg, 20146 Hamburg, Germany

Learning leads to the formation of schemata, i.e. knowledge structures that aid the encoding and retrieval of schema-relevant information. Schema-based memory processes are of particular interest as they offer insight into how already acquired information can be utilized to integrate related new information. Stress is known to alter learning and memory processes through the action of glucocorticoids and noradrenaline. Yet, how these stress mediators affect schema-based memory processes is unknown. To address this issue, we used a pharmacological approach in which 96 healthy participants received orally a placebo, hydrocortisone, the α2-adrenoceptor-antagonist yohimbine, leading to increased noradrenergic stimulation, or both drugs, before completing a schema-based learning task. Data are currently being analyzed and results will be presented at the conference.

**A-0274 The effects of smoking and different socioeconomic backgrounds on multiple self-regulation domains**

Sabine Pompeia, Raquel de Luna Antonio
Universidade Federal de São Paulo, Brazil

Both smoking and low socioeconomic status (SES) worsen self-regulation, but it is unknown whether people of lower SES are more susceptible to these effects of smoking. In a cross-sectional design study including 80 healthy young adults, performance of smokers and non-smokers from different SES backgrounds were compared in terms of: inhibition, shifting, updating, dual-tasking, planning, access to long-term memory, impulsivity, delayed discounting, and risk taking. Nicotine abstinence and its acute effects were controlled. Smoking and SES interacted only regarding inhibition. Irrespective of SES, smokers were also more impulsive, had more difficulty planning and discounted larger rewards more steeply. Cigarettes smoked, exhaled carbon monoxide, cotinine, dependence to nicotine, heart rate and body-mass index did not mediate smoking effects on self-regulation.

**A-0282 The self-advantage in self/other source memory predicts naturalistic prospective memory**

Ruth Ford [1], Judi Ellis [2]
[1] Anglia Ruskin University, Cambridge, UK; [2] Reading University, Reading, UK

Predictors of prospective memory (PM) were explored in a sample of 40 young adults (M age = 26 years). Four naturalistic PM tasks were embedded in a 90-minute laboratory session which involved tests of memory span, immediate- versus delayed recall of simple motor actions, recognition-memory, self/other source memory, and visual and motor imagery. Results showed robust, positive correlations between the various measures of retrospective memory, while revealing a role of imagery in delayed recall. In contrast, PM was predicted solely by memory span and the self-advantage in source memory, that is, the extent to which participants showed superior source memory for self-performed over other-performed actions. We discuss these findings in relation to the possible involvement of self-referential processes in PM.

**A-0300 Errorful and errorless learning in preschoolers: at what age does the errorful advantage appears?**

Yifat Faran [1], Yaniv Sophen [2], Dorit Ben Shalom [3]
[1] Ashkelon Academic College, Ashkelon, Israel [2] Chemdat Ha'darom Academic college, Netivot, Israel [3] Ben Gurion University of the Negev, Beer Sheva, Israel

Episodic memory has been tested excessively in young children. The results show that young children's memory is weak and decays quickly but also has some episodic-like aspects. This inconsistency has led to a debate whether young children have episodic memory or not. When adults with impaired episodic memory are tested for semantic learning, they show better memory in errorless procedures. This is in contrast to healthy adults who show better memory in errorful procedures. We used this paradigm in 3- and 5-years-olds. 3-years-olds remembered less than 5-years-olds, but they both showed the same errorful advantage. Our data shows that even though 3-years-old children memory is weak, it does have similar characteristics to intact episodic memory.

**A-0306 Tracking collective schemas in individual memories**

Pierre Gagnepain [1,2,3,4], Thomas Vallée [1,2,3,4], Denis Peschanski [5,6,7], Francis Eustache [1,2,3,4]
[1] Inserm, U1077, Caen, France [2] Université de Caen Normandie, UMR_S1077, Caen, France [3] Ecole Pratique des Hautes Études, UMR_S1077, Caen, France [4] Centre Hospitalier Universitaire, UMR_S1077, Caen, France [5] Paris 1 Panthéon-Sorbonne, UMR_8058, Paris, France [6] CNRS, Centre d'histoire sociale du XXe siècle, UMR_8058, Paris, France [7] Equipex MATRICE

This study sought to assess whether sociocultural schemas stored in collective memory shape the organization of individual memories in medial prefrontal cortex (mPFC). We recorded brain activity using fMRI in 24 healthy participants while there were remembering pictures from a tour at the WWII Normandy-Memorial. An image arrangement task was used to capture the structure of participants' semantic space (individual schema), as well as common representations across control individuals (shared schema). Cultural schema was measured using topic modelling analysis of more than 4000 French television News about WWII (http://www.matricememory.fr/). Schemas were compared to neural organization of individual memories using Representational Similarity Analysis. Dorsal portion of mPFC specifically encapsulates the collective structure of knowledge above and beyond individuals' own representations.

**A-0315 Effects of age and cognitive control availability on deactivation of completed intentions**

Moritz Walser [1], Marcus Möschl [1], Mareike Altgassen [2], Rico Fischer [3]
[1] Technische Universität Dresden, Germany; [2] Radboud University, Nijmegen, The Netherlands; [3] Ernst-Moritz-Arndt Universität Greifswald, Germany

Prospective memory denotes the ability to postpone intention execution until the right circumstances are met. Here, we investigated the role of cognitive-control availability on subsequent intention deactivation. To this aim, we manipulated control availability via conflict strength during the processing of no-longer-relevant prospective memory cues in a Majority Function Task. If availability of cognitive control was crucial for intention deactivation, aftereffects of completed intentions should be most pronounced under high control demands. These effects should be even stronger for older compared to younger adults. Contrary to our hypothesis, we found comparable aftereffects of completed intentions for younger and older adults. Importantly, aftereffects increased from low-conflict to high-conflict trials, suggesting that intention deactivation relies upon availability of

cognitive control.

**A-0318 Body-object interaction ratings for 750 Spanish words**

María A. Alonso [1,3], Emiliano Díez [2,3], Antonio M. Díez [2], Angel Fernandez [2,3]
[1] Universidad de La Laguna, Spain; [2] Universidad de Salamanca, Spain; [3] Instituto Universitario de Integración en la Comunidad INICO, Salamanca, Spain

Body-object interaction (BOI) reflects an individual's sense of the extent to which her/his body physically interacts with objects in the environment and it has been shown to modulate lexical and semantic processing of object names. To further explore the nature of those effects, we collected BOI ratings for 750 Spanish concrete nouns from 178 participants. Statistical analyses showed moderate correlations between BOI indicators and some psycholinguistic indexes such as word imaginability and age of acquisition. Additionally, an exploration of lexical associative relationships revealed that high-BOI words have a consistent tendency to be associated with words naming parts of the body. The ratings could be useful to researchers who are interested in manipulating or controlling for the effects of BOI.

**A-0326 Remember and switch: How dual and task-switching response conditions affect event-based prospective memory performance**

Diana R. Pereira [1], Pedro B. Albuquerque [2], Flávia H. Santos [2,3]
[1] Neuropsychophysiology Lab, CIPsi, School of Psychology, University of Minho, Braga, Portugal [2] Human Cognition Lab, CIPsi, School of Psychology, University of Minho, Braga, Portugal [3] Laboratory of Neuropsychology, Post-graduation Program in Developmental Psychology and Learning, UNESP, University of the State of São Paulo, Bauru, Brazil

The experimental appraisal of event-based Prospective Memory (PM) has been characterized by the interchangeable use of dual task and task-switching response conditions without taking into consideration that they might involve distinct processing features. Accordingly, we aimed to clarify the impact of the former responses in the PM performance. Thirty two participants performed a task switching paradigm with an embedded PM task, following a within-subjects 3 (type of response: no PM response/dual task/task-switching) x 3 (switching load: pure/repetition/alternation) design. The results yielded no relevant effects of type of response in both PM accuracy and ongoing task performance. Yet a significant PM interference effect was found, revealing slower response times in the ongoing activity when the PM task was introduced.

**A-0335 Improving relational memory in older adults – a cue based approach**

Benjamin Sturm [1], Hubert Zimmer [1]
[1] University of Saarland, Saarbruecken, Germany

A strong associative deficit in old age exists which is partially due to maladaptive encoding strategies. Only after giving environmental support, elderly people try to adapt their encoding operations to task demands. We investigated whether a cue indicating the encoding difficulty of an item pair is sufficient to compensate the association deficit. Seniors and students studied object pairs which were later tested in an associative recognition test. The difficulty of finding relations between the objects was parametrically manipulated. Only elderly had an advantage of cue presentation but their associative memory was still much poorer than the one of young participants. This demonstrates that minimal support by indicating the item difficulty is not sufficient to compensate the association deficit.

**A-0337 A dynamic field theory approach to prospective memory and intention deactivation**

Moritz Walser, Heike Stein, Stefan Scherbaum
Technische Universität Dresden, Germany

Prospective Memory (PM), i.e., realizing delayed intentions, depends on interacting spontaneous and attention-based retrieval mechanisms. Spontaneous retrieval manifests in aftereffects: After intention completion, formerly relevant PM cues still interfere with the main task. However, the mechanisms behind spontaneous retrieval and its interaction with attentional monitoring remain unclear. We used a dynamic field model to integrate and formalize retrieval mechanisms. The model allows investigating PM performance and aftereffects as well as controlling for PM cue distractor effects. In simulations, typical RT patterns, including aftereffects, effects of monitoring and cue salience, were reproduced. Additionally, we generated hypothetical fMRI data. The model proves a useful tool in explaining the cognitive mechanisms underlying PM retrieval as well as in developing behavioral and neural hypotheses.

**A-0346 Bilingual Children's Recalled Stories in Chinese and English**

Jessie Bee Kim Koh, Elena Nicoladis, Paula Marentette
University of Alberta, Alberta, Canada

This study examined the structure, content and style of thinking in bilingual children's recalled stories in Chinese and English. Participants were 41 Chinese-English bilingual children aged 4-6 years. Each child watched a cartoon and recalled the story, once in each language. Stories recalled in Chinese showed more referential and evaluative information, shared actions by story characters, internal states of characters, and integrated style of thinking. Conversely, stories recalled in English showed greater proportions of orientation information, actions by the main character and differentiated style of thinking. Furthermore, a greater proportion of the stories recalled in Chinese than in English showed usage of authoritarian speech. Findings suggest that bilingual children's memories of stories are mediated by culture and language.

**A-0501 The effects of socioeconomic factors on fractionated executive functions**

Sabine Pompeia, Raquel de Luna Antônio
Universidade Federal de Sao Paulo, Brazil

Low socioeconomic status (SES) is associated with impaired executive attention, but which executive domains are affected is unclear. In a cross-sectional design study including 80 young, healthy adults who had completed secondary school we investigated the effects of SES (family spending power, parents' education, family earnings) on performance in tests of various subtypes of EF (inhibition, updating, shifting, planning, access to long-term-memory, dual-tasking) and working memory capacity (WMC). Performance in all domains except access to long-term-memory and dual-tasking were negatively affected by low SES. When we controlled for WMC, inhibition and shifting effects disappeared. Effects of SES on WMC were mediated by general knowledge, inhibition cost, and updating measures, but not shifting, short-term verbal memory nor reaction time.

**A-0614 A comparison of working memory and episodic memory decline with age.**

Selma Lugtmeijer [1,2], Edward H.F. de Haan[2], Roy P.C. Kessels[1].
[1] Donders Institute for Brain, Cognition and Behaviour, Radboud University, Nijmegen, the Netherlands; [2] University of Amsterdam, the Netherlands.

Working memory (WM) and episodic memory (EM) decline with age. Whether this decline is to the same extent for both systems is under debate.

This study compares performance of healthy younger (N=13;Mage=22,9) and older adults (N=19;Mage=72,6) on an object 2-back task (WM) and a subsequent EM task with similar visuo-spatial characteristics. The subsequent memory task assessed incidental encoding of object locations of the 2-back task. Younger and older adults performed similarly on the 2-back task (Myoung=.81;Mold=.75;d=.48). On the subsequent memory task younger adults outperformed older adults (Myoung=.40;Mold=.28;d=.64). Older adults made more false alarms during the 2-back task (Myoung=1.62;Mold=4.37;d=.88). EM is stronger affected by age. However, during WM older adults make more false alarms, possibly due to a decline in inhibition.

**A-0592 How should the police replicate a suspect's distinctive feature across foils?**

Melissa F Colloff, Kimberley A Wade
University of Warwick, UK.

To stop suspects with distinctive features from standing out in lineups, police officers often digitally add the suspect's feature onto the other lineup members. But how much variation in the replication of the feature is optimal? Over 2700 adults watched two mock-crimes and attempted to identify the culprits. Neither moderate-variation (study 1) nor high-variation (study 2) were better than low-variation at enhancing subjects' ability to discriminate between innocent and guilty suspects. In fact, when the feature varied a lot across lineup members, performance was as poor as when the suspect was the only person in the lineup with the feature. Our findings contribute to our theoretical understanding of eyewitness identification behaviour and have important implications for police practice.

**A-0596 Neurobehavioural characteristics of limbic encephalitis associated with voltage-gated potassium channel complex antibodies**

Clare Loane, Adriana Roca-Fernandez, Christopher R Butler
Memory Research Group, Nuffield Department of Clinical Neurosciences, University of Oxford, Oxford UK.

It is known that limbic encephalitis associated with antibodies to the voltage-gated potassium channel complex (VGKC-LE) may result in memory impairment with accompanying hippocampal damage. However, comprehensive characterisation of the neurobehavioural profile of VGKC-LE patients is currently lacking. Here, we present in-depth neuropsychological and structural MRI data from a group of VGKC-LE patients (n>20) using manual medial temporal lobe delineation and whole brain voxel based morphometry. We confirm that VGKC-LE is radiologically characterised by focal hippocampal atrophy. Furthermore, cognitive impairment is confined to the memory domain and persists for years after initial presentation. To our knowledge, this is the first comprehensive neurobehavioural assessment of VGKC-LE and suggests that the syndrome is a good lesion model for studies of hippocampal function.

**A-0604 Effects of acute stress on prospective-memory monitoring and intention deactivation**

Marcus Möschl[1], Moritz Walser[1], Franziska Plessow[2], Thomas Goschke[1], Rico Fischer[3]
[1] Technische Universität Dresden, Germany; [2] Harvard Medical School, Boston, MA, USA; [3] Ernst-Moritz-Arndt Universität Greifswald, Germany

In everyday life we frequently rely on our abilities to postpone intentions until later occasions (prospective memory; PM) and to deactivate completed intentions even in stressful situations. Previously, we found preserved PM and intention deactivation under stress during low task demands (Walser, Fischer, Goschke, Kirschbaum, & Plessow, 2013). To investigate the interplay between stress and PM task demands, we increased demands on a) intention deactivation and b) PM-cue detection (monitoring). Replicating findings of our previous study, stress induction (Trier Social Stress Test) did not affect intention deactivation. Most importantly, while leaving prospective remembering intact, acute stress reduced PM-monitoring costs under heightened monitoring demands. This suggests a stress-induced shift towards more resource-saving processing strategies when PM-task demands are high.

**A-0606 People can identify a face even if the person's facial impressions have changed.**

Yuiko Sakuta [1], Ryoko Yamada [2], Yoshinori Inaba [2], Shigeru Akamatsu [2]
[1] Jissen Women's University, Tokyo, Japan; [2] Hosei University, Tokyo, Japan

Recently, various studies have clarified that humans can immediately make a social evaluation from facial appearance. In particular, trustworthiness and dominance are thought to be two important dimensions of social judgment. We examined whether participants can identify persons even if their impression of trustworthiness has slightly changed between the encoding and test phases. We used computer-generated faces whose trustworthiness impressions were systematically manipulated (Todorov et al., 2013). Results showed that the participants tended to recognize the faces as encoded ones when these impressions were manipulated in a positive direction (i.e., more trustworthy). It was suggested that people can identify a person even if the person's facial impression has changed, that is, memory representation of the face would contain variable impressions.

**A-0608 "Have you seen this child?": The effect of crime re-enactment on eyewitness memory.**

Hayley Cullen, Celine Van Golde, Helen Paterson
The University of Sydney, Australia

Research on eyewitness memory has identified many sources of post-event information (PEI), finding that PEI can have both positive and negative effects on eyewitness memory. However, one such source of PEI that has not been investigated is crime re-enactment. The purpose of the current study was to explore how crime re-enactment influences eyewitness memory. 135 participants viewed one of three kidnapping events, and one week later half of the participants were shown a crime re-enactment featuring warnings about the use of actors and containing correct and incorrect PEI. Free recall and lineup identification accuracy were measured. It was found that viewing the re-enactment led participants to accept more misinformation and to misidentify the re-enactment perpetrator as the real culprit.

**A-0611 Statistical learning is reflected in event-related brain potentials (ERPs)**

Andrea Kóbor [1], Ádám Takács [2], Zsófia Kardos [3,4], Karolina Janacsek [2,5], Brigitta Tóth [3,6], Csenge Török [2,5], Zsófia Zavecz [2,5], Márk Molnár [3,2], Dezso Nemeth [2,5]
[1] Brain Imaging Centre, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary; [2] Institute of Psychology, Eötvös Loránd University, Budapest, Hungary; [3] Institute of Cognitive Neuroscience and Psychology, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary; [4] Department of Cognitive Science, Budapest University of Technology and Economics, Budapest, Hungary; [5] MTA-ELTE NAP B Brain, Memory and Language Research Group, Institute of Cognitive Neuroscience and Psychology, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary; [6] Center for Computational Neuroscience and Neural Technology, Boston University, Boston, USA

Statistical learning enables the extraction of environmental regularities. Here we investigated the temporal dynamics of statistical learning processes using ERPs in young adults. Statistical learning was induced by the Alternating Serial Reaction Time task in a learning phase and a testing phase

24 hours later. The centroparietal negative ERP component between 250-450 ms after stimulus onset was larger for low- than for high-probability stimuli suggesting a mismatch with the implicit expectation of subsequent stimuli. The parieto-occipital positive component between 450-550 ms was larger in the testing than in the learning phase suggesting elaborative processes due to the reactivation of consolidated memory traces. These results give insight to the dynamic change of multiple processes accompanying statistical memory formation and consolidation.

**A-0612 The effects of emotional and decisional forgiveness on intentional forgetting in the directed-forgetting paradigm**

Saima Noreen, Malcolm D. MacLeod
[1] Goldsmiths, University of London, UK [2] Stirling University, Scotland, UK

We explored the extent to which emotional and decisional forgiveness influenced intentional forgetting. Using the List-Method Directed-Forgetting paradigm, 236 participants were presented with a hypothetical transgression and then assigned to either an emotional forgiveness, a decisional forgiveness, or a no-forgiveness manipulation. Participants were also presented with two lists of relevant and irrelevant transgression-related words and were told either to remember or forget the previously learned list of words. We found that when directed to forget words in List-1, participants in the decisional and no-forgiveness conditions were less able to forget relevant transgression-related words in comparison to participants in the emotional forgiveness condition. Our study suggests that emotional forgiveness plays the pivotal role in the intentional forgetting of transgression-related information.

**A-0613 Stereotypes – collective memory – political system transformation**

Aleksandra Niewiara
University of Silesia in Katowice, Poland

Study on images of nations as figures of collective memory presents the results of two associative surveys (verbal and pictorial) that was carried out in two stages (verbal in 1990 and 2012; pictorial in 1994 and 2012) among Polish youngsters. The findings concern the relationships between the changes in the social optics and representations resulting from the transformation of the political system (in Poland in 1989). The observation of the work of cultural and communicative memories (according to Ian Assmann terminology) in actual creation of the images of the Other and the Self in 1990/1994 and 2012 is the issue of the poster.

**A-0615 Remembering and Knowing in Olfactory Working Memory**

Andrew Moss, Andrew Johnson, Jane Elsley, Christopher Miles
Bournemouth University

Dual processing theory holds that successful recognition can come from item familiarity, or explicit recollection of item details. With olfactory memory, stimuli that are identified show long-term recollection levels similar to verbal stimuli (Olsson, Lundgren, Soares, & Johansson, 2009). An n-back procedure with olfactory stimuli was used to investigate recollective experience for odours that elicit strong or weak verbal associations in working memory. A binary forced-choice judgement was made as to whether the currently presented item matched that presented two trials previous. Following a positive response, a remember/know/guess judgement was made. Similar to long-term memory, a working memory advantage for highly verbalisable odours was shown to be driven by increased ‘R’ responses, with stable ‘K’ responses across odorant verbalisability.

**A-0616 When context matters: Electrophysiological correlates of associative learning and memory for neutral items bound to emotional contextual information.**

Carlos Ventura-Bort [1], Andreas Löw [2], Julia Wendt [1], Florin Dolcos [3], Alfons Hamm [1], Mathias Weymar [1]
[1]Department of Biological and Clinical Psychology, University of Greifswald, Germany [2]Department of Humanities and Social Sciences, Helmut-Schmidt-University/University of the Federal Armed Forces Hamburg, Germany [3]Psychology Department, Neuroscience Program, Beckman Institute for Advanced Science and Technology, University of Illinois at Urbana-Champaign, USA

We investigated brain dynamics of associative learning and memory for objects that had been encoded in emotional and neutral contexts. During encoding, 144 different objects bound to 144 different emotional and neutral backgrounds were presented in two consecutive blocks in order to compare ERPs in response to neutral object before and after one single pairing. The retrieval session (one week later) consisted of an Old/New paradigm with 288 (144 old) objects. Results showed better memory for neutral objects from emotional, relative to neutral, contexts, that was associated with enhanced perceptual (P100) and elaborated processing (LPP) during encoding, and retrieval activity (ERP old/new effect) one week later. These results could shed light on learning and memory mechanisms involved in trauma-related memories.

**A-0618 Processing of objects in an allocentric reference frame in a cross-maze task**

Agoston Torok[1,2,3], Andrea Kobor[1], Gyorgy Persa[4], Peter Galambos[4], Peter Baranyi[4], Valeria Csepe[1], Ferenc Honbolygo[1,3]
[1] Brain Imaging Centre, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary [2] Doctoral School of Psychology, Eötvös Loránd University, Budapest, Hungary [3] Department of Cognitive Psychology, Faculty of Pedagogy and Psychology, Eötvös Loránd University, Budapest, Hungary [4] 3D Internet based Control and Communications Laboratory, SZTAKI, Hungarian Academy of Sciences, Budapest, Hungary

The spatial location of visual objects is processed in ego- and allocentric reference frames. In previous studies using T-maze it was found that participants processed the spatial location of reward objects in an egocentric reference frame. In the current study, we provide evidence for the processing of reward object locations in an allocentric reference frame. For this purpose, we designed an experiment where human participants were placed in an immersive virtual cross-shaped maze environment. Results showed that the amplitude of the P1 event-related component was modulated by the allocentric location of the objects appearing in the side alley. We interpret this result as the allocentric reference frame is activated when participants are required to reorient themselves in the task.

**A-0619 How to boost consolidation of implicit probabilistic learning by manipulation of reconsolidation**

Csenge Török [1,2], Janacsek Karolina [1,2], Dezso Nemeth [1,2]
[1] MTA-ELTE NAP B Brain, Memory and Language Research Group, Institute of Cognitive Neuroscience and Psychology, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary [2] Institute of Psychology, Eötvös Loránd University, Budapest, Hungary

Implicit probabilistic learning has been defined as sensitivity to regularities, patterns and statistical dependencies in the environment. The processes of consolidation and reconsolidation of this fundamental learning mechanism is still unclear. The aim of the present study was to investigate how the consolidation was affected by modifications of temporal parameters in the reconsolidation phase. We used a probabilistic sequence learning task with fix response-to-stimulus-interval (RSI) in the learning phase and random RSI six hours later in the reconsolidation phase, compared to the control condition where fix RSI was administered in the reconsolidation phase. Performance was tested after a 16-hour delay. Our presentation discusses how changes in temporal parameters in the reconsolidation phase alter consolidation.

**A-0621 Consolidation of prospective memory: The effect of sleep on completed and reinstated intentions**

Christine Barner, Mitja Seibold, Jan Born, Susanne Diekelmann
Institute of Medical Psychology and Behavioral Neurobiology, Tübingen, Germany

Sleep has been shown to support the consolidation of intentions for the future (prospective memory). Here we asked whether intentions need to be active across sleep in order to benefit from sleep. In Experiment I, we found that sleep does not elicit a beneficial effect once the intention has been completed before sleep. Experiment II showed that reinstructing the intention after its completion was not sufficient for reinstating a beneficial sleep effect. Finally, in Experiment III, the intention (i) was induced in temporal proximity to cue learning, and (ii) subjects expected the test session to take place after sleep. Under these conditions, sleep supported intention execution even though it had been completed once before sleep.

**A-0623 Sleep facilitates the reconsolidation of declarative memories**

Jens G. Klinzing[1,2,3], Björn Rasch [4], Jan Born [1,3], Susanne Diekelmann [1]
[1] Institute for Medical Psychology and Behavioral Neurobiology, University of Tübingen, Germany; [2] Graduate School of Neural and Behavioural Sciences, University of Tübingen, Germany; [3] Centre for Integrative Neuroscience (CIN), University of Tübingen, Germany; [4] Department of Psychology, University of Fribourg, Switzerland

Sleep is known to support the consolidation of newly encoded and initially labile memories. Once consolidated, remote memories can return to a labile state upon reactivation and need to become re-consolidated in order to persist. Here we asked whether 40 minutes of sleep also benefits the re-consolidation of remote memories after their reactivation and how re-consolidation during sleep compares to sleep-dependent consolidation processes. The results show that a short sleep period facilitates the re-consolidation of reactivated remote memories, but not the consolidation of non-reactivated remote memories or recently encoded memories. These findings suggest that sleep has a beneficial effect for the re-consolidation of remote memories in humans, acting at a faster rate than sleep-associated consolidation processes.

**A-0624 Goal maintenance and working memory in preschoolers. Can goal cueing improve their performance and under what conditions?**

Christophe Fitamen [1,2], Agnès Blaye [2], Valérie Camos [1]
[1] Université de Fribourg, Fribourg, Switzerland; [2] Université d'Aix-Marseille, Marseille, France

Goal neglect has been shown to contribute to preschoolers' poor executive control. Is it also involved in their poor working memory capacity? To address this question, we tested two forms of goal cueing visual animations. During the retention delay of a Brown-Peterson task, 3-and 4-year-old children had to maintain verbal information. In three experiments, an informative animation was used as goal cueing and a non-informative neutral animation was used as baseline. Moreover, the degree of concurrent attentional demand to process the informative cue was varied across experiments. The findings evidenced the role of both attention and goal maintenance in this age range. Their differential impact as a function of age will be discussed.

**A-0625 Effects of an unrelated working memory task on memory consolidation**

Samarth Varma, Sander Krewinkel, Maaike van Kooten, Lily Fu, Roy Kessels, Sander Daselaar
Donders Institute for Brain, Cognition and Behaviour, Radboud University,Nijmegen, The Netherlands

Common across research on long-term interference effects are experimental designs in which subjects are required to engage in meaningful post-encoding tasks where the stimulus is salient, either with respect to oneself (e.g., cued-autobiographical thinking task) or the external world (e.g., picture naming, spot-the-difference task). In this study we tested whether engaging in a non-meaningful, post-encoding n-Back task could elicit interference as compared to the standard, quiet wakeful rest control. Across both recall and recognition tests, no effects of interference could be established. These findings challenge prevalent notion that quiet wakeful rest is necessary for optimal consolidation, and prompts a reexamination of processes and brain states that impede or accelerate forgetting.

**A-0626 Is the testing effect driven by retrieval or articulation?**

Max Larsson Sundqvist, Fredrik U. Jönsson
Department of Psychology, Stockholm University

In four experiments, the current study aimed to disentangle the effects of retrieval and articulation on the testing effect. Results from the first two experiments showed a typical testing effect, but no additional benefits of articulation after retrieval. In two follow-up experiments, articulation again showed little to no benefit beyond that of retrieval.Thus, the testing effect appears to be mainly driven by retrieval, not articulation.

**A-0627 Medial temporal and frontoparietal involvement in object and scene recollection**

Heidrun Schultz [1], Karen F. LaRocque [2], Stephanie A. Gagnon [2], Anthony D. Wagner [2], Bernhard P. Staresina [2,3]
[1] Department of Education and Psychology, Freie Universität Berlin, Berlin, Germany; [2] Department of Psychology, Stanford University, Stanford, USA; [3] School of Psychology, University of Birmingham, UK

During recollection, subjective re-experience of a memory may be reflected in cortical reinstatement of perception-related neural activity. BOLD time course analysis has shown that domain-general hippocampal signalling may link retrieval cues to associated information, thereby facilitating domain-specific reinstatement. It is unclear, however, how a putative frontoparietal recollection network plays into this mechanism. Here, we acquired whole-brain fMRI data at high temporal resolution (TR = 1s) while n=20 participants encoded and retrieved adjectives. During encoding only, these were paired with an object or scene image. A network involving medial temporal lobe areas as well as frontoparietal cortex supported domain-general and domain-specific processing, with partial overlap between encoding and retrieval.

**A-0630 Sleep-dependent Gist Abstraction in Visual Learning**

Nicolas D. Lutz [1,2], Susanne Diekelmann [1], Jan Born [1,3], Karsten Rauss [1]
[1] Institute of Medical Psychology and Behavioral Neurobiology, University of Tübingen, Germany; [2] Graduate Training Centre of Neuroscience / IMPRS for Cognitive & Systems Neuroscience, University of Tübingen, Germany; [3] Werner Reichardt Centre for Integrative Neuroscience, University of Tübingen, Germany

A single night of sleep or a short nap can be sufficient to consolidate memories of individual stimuli. In the long-term, however, it may be more efficient to retain the overlap between similar stimuli, i.e. the gist of the encoded information. Previous research suggests that gist abstraction could develop over multiple nights of sleep. Using a visual version of the Deese-Roediger-McDermott (DRM) paradigm, we found that sleep compared to wakefulness does not support gist abstraction when tested 10 hours after learning. Nevertheless, when participants were retested after one year, gist abstraction was evident only for stimuli which had been encoded immediately before sleep. Our findings demonstrate that sleep supports

adaptive long-term memories even in the absence of short-term effects.

**A-0632 Probabilistic sequence learning in Tourette-syndrome**

Ádám Takács [1], Andrea Kóbor [2], Karolina Janacsek [1,3], Shilon Yuval [4], Júlia Chezan [1,5], Noémi Éltető [1], Zsanett Tárnok [5], Antoine Tremblay [6,7], Michael T. Ullman [8], Dezso Nemeth [1,3]

[1] Institute of Psychology, Eötvös Loránd University, Budapest, Hungary [2] Brain Imaging Centre, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary [3] MTA-ELTE NAP B Brain, Memory and Language Research Group, Institute of Cognitive Neuroscience and Psychology, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary [4] Kaplan Medical Center, Rehovot, Israel [5] Vadaskert Child Psychiatry Hospital, Budapest, Hungary [6] Dalhousie University, Halifax, Canada [7] Saint Mary's University, Halifax, Canada [8] Department of Neuroscience, Georgetown University, Washington, DC United States

The present studies investigated implicit probabilistic sequence learning (PSL) in Tourette syndrome (TS). The first study assessed PSL in children with TS, ADHD, comorbid TS-ADHD, and typically developing (TD) children. All four groups showed evidence of sequence learning and did not differ from each other on measures of PSL. The second study compared PSL between children with TS and TD children. The PSL task was assessed in two sessions with a 16-hour delay. Children with TS showed higher PSL than TD children at the end of the first session. However, children with TS showed weaker consolidation. In sum, children with TS showed intact online PSL but impaired consolidation and comorbid ADHD did not contribute to this difference in learning.

**A-0633 The consolidation of explicit and implicit probabilistic sequence learning**

Kata Horváth [1,2], Csenge Török [1,2], Orsolya Pesthy [1], Balázs Török [3], Karolina Janacsek [1,2], Dezso Nemeth [1,2]

[1] MTA-ELTE NAP B Brain, Memory and Language Research Group, Institute of Cognitive Neuroscience and Psychology, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary; [2] Institute of Psychology, Eötvös Loránd University, Budapest, Hungary; [3] Department of Cognitive Science, Budapest University of Technology and Economics, Budapest, Hungary

Probabilistic sequence learning is based on recognition of statistical patterns/regularities of the environment. This process can occur with or without awareness. The present study aimed to investigate the differential processes of consolidation in explicit and implicit form of this fundamental learning mechanism. A fix-paced sequence learning task was administered twice with a 12-hour between-session delay which included either sleep or daily activity. The explicit group was informed about the sequence structure by cues and verbal instructions, while the implicit group was unaware of the sequence. After the 12-hour delay the performance was retained in the implicit group, however the explicit group showed forgetting. We found no effect of sleep. Our findings extend the literature to probabilistic sequence learning and consolidation.

**A-0635 An fMRI study of the supportive role of feedback during test-enhanced learning**

Carola Wiklund-Hörnqvist [1 3], Bert Jonsson [1], Micael Andersson [2,3], Lars Nyberg [2,3,4]

[1] Department of Psychology, Umeå University, Sweden [2] Department of Integrative Medical Biology, Umeå University, Sweden [3] Umeå Center for Functional Brain Imaging (Ufbi) [4] Department of Radiation Sciences, Umeå University, Sweden

Considerable research in cognitive psychology has demonstrated that testing improves the performance on later retention tests (i.e., the testing-effect). One key factor is the inclusion of feedback which enhances the benefits. Participants (n=21) first studied 60 Swahili-Swedish word-pairs. Subsequently, they underwent fMRI while being tested on each study-item either with or without feedback. Contrary to no feedback, several regions were identified as a feedback-network with the strongest contribution from the bilateral MTL regions (anterior hippocampus, amygdala), insula and left IFC. Several of these responses were modulated by type of response (correct/incorrect) and repetition (1,2,3). These findings link the effect of feedback on learning to strengthening of semantic representations, providing novel insights about the crucial role of feedback during test-enhanced learning.

**A-0636 If you run after two hares within visual working memory, you might catch both: Exploring the effect of retro-cueing multiple items after item offset**

Masae Takeno [1], Taiji Ueno [1], Richard J Allen [2]

[1] Department of Psychology, Nagoya University, Nagoya, Japan; [2] School of Psychology, University of Leeds, Leeds, United Kingdom

Past studies have examined whether retro-cueing multiple items after item offset can enhance their memory accuracy, and have suggested specific experimental conditions where a significant accuracy enhancement can be observed. However, an alternative explanation for such boundary conditions is that response methods were not sufficiently sensitive to detect small effects. This study used cued verbal recall as an alternative measure, and found possible evidence for multiple items retro-cueing without the need for such boundary conditions. Although we demonstrated an advantage of a cued verbal recall measure over a 2-alternative recognition measure, it is still unclear whether the demonstrated effect of multiple retro-cues implies that two items can simultaneously benefit from retro-cuing.

**A-0638 Shared processes between episodic memory and online spatial updating**

Mélanie Cerles [1,2], Maëlle Tixier [1], Stéphane Rousset [1,2]

[1] Univ. Grenoble Alpes, LPNC, F-38000 Grenoble, France; [2] CNRS, LPNC, F-38000 Grenoble, France

Online spatial-updating processes self-to-object relationships during self-displacement. Episodic memories are re-experienced from a first-person perspective. This implies locating the rememberer in the recollected space. These similarities are consistent with models suggesting that episodic memory retrieval relies on a spatial updating simulation. If these two capacities share a common process, then they should interact even if they operate on unrelated materials and tasks. Congruent results were obtained in experiments where participants performed simultaneously source recall based on previously learned words and a spatial task on unrelated objects located in the immediate environment. The spatial updating condition produces specific interference with episodic source recall, even if this condition was the easiest compared to other spatial conditions.

**A-0639 Can neural functional connectivity index the quality of procedural memory consolidation?**

Zsófia Zavecz [1,2], Brigitta Tóth [3,4], Ádám Takács [2], Andrea Kóbor [5], Karolina Janacsek [1,2], Dezso Nemeth [1,2]

[1] MTA-ELTE NAP B Brain, Memory and Language Research Group, Institute of Cognitive Neuroscience and Psychology, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary [2] Institute of Psychology, Eötvös Loránd University, Budapest, Hungary [3] Institute of Cognitive Neuroscience and Psychology, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary [4] Center for Computational Neuroscience and Neural Technology, Boston University, Boston, USA [5] Brain Imaging Centre, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary

Procedural memory plays a critical role in skills and automatic behavior. The present study aimed to investigate the consolidation of procedural memories by measuring interplay between brain regions (functional connectivity - FC) that promote consolidation of procedural learning. Thirty

adults performed a probabilistic sequence learning task on two consecutive days (with 24 hours delay) while electroencephalogram was recorded. Phase synchronization measurement was used to quantify FC during learning phase and at the test phase (after consolidation). Characteristics changes in the magnitude of FC was found between study and test phase presumably due to the dynamic reorganization of the FC associated with procedural encoding and retrieval processes. Additionally, FC found to be characteristically changed as a function of consolidation efficiency.

**A-0640 Judgments of learning: comparing confidence with yes/no responding**

Radka Jersakova [1], Richard Allen [1], Celine Souchay [2], Janet Metcalfe [3]
[1] University of Leeds, UK; [2] Université Grenoble Alpes, France; [3] Columbia University, USA

Recent research suggests when predicting memory performance, confidence (0-100%) and binary (yes/no) responses differ. Across two experiments we compared judgments of learning (JOLs) made with the two response formats. Participants were asked to predict either recall or recognition. As expected, JOLs were higher for recognition than recall when the type of retrieval predicted changed on a trial level (Experiment 1) but not when prediction type was blocked (Experiment 2). There were no differences in discrimination between response formats: overall confidence expressed was the same as percentage of yes responses given. However, participants presented a more liberal (positive) response bias on the binary as compared to the confidence scale. This suggests the two response formats might not be equivalent.

**A-0644 Disrupting the pattern: Further testing of the spatiotemporal hypothesis of multitasking**

Ivo Todorov [1], Veit Kubik [1], Fabio Del Missier [1,2], Timo Mäntylä [1]
[1] Stockholm University, Sweden; [2] University of Trieste, Italy

We tested the spatiotemporal hypothesis of multitasking, which posits that under high temporal load, individuals with better spatial abilities are better at multitasking. A computerized multitasking simulation was administered under three different conditions, one ordinary and two conditions with additional concurrent spatial load. Participants were assigned to one of three groups, luteal females, menstrual females and males. Based on the literature, these groups differ in spatial abilities because of hormonal fluctuations linked to the menstrual cycle. Across all three versions of the multitasking simulation, the performance of the luteal group was lowest, while the menstrual and the male group did not differ significantly from each other. The results support the notion that participants with better spatial ability are better multitaskers.

**A-0646 Neural oscillatory functional connectivity associated with statistical learning**

Brigitta Tóth [1,2], Zsófia Zavecz [3,4], Ádám Takács [4], Andrea Kóbor [5], Karolina Janacsek [3,4], Dezso Nemeth [3,4]
[1] Institute of Cognitive Neuroscience and Psychology, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary [2] Center for Computational Neuroscience and Neural Technology, Boston University, Boston, USA [3] MTA-ELTE NAP B Brain, Memory and Language Research Group, Institute of Cognitive Neuroscience and Psychology, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary [4] Institute of Psychology, Eötvös Loránd University, Budapest, Hungary [5] Brain Imaging Centre, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary

Statistical learning is crucial for obtaining motor, cognitive, and social skills. The present study aimed to investigate the functional connectivity (FC) networks which promote successful statistical learning. Young adults performed the Alternating Serial Reaction Time task. FC was measured by phase synchronization index (128-channel electroencephalogram). Our results show that statistical learning performance was associated with an increase of FC in the posterior brain regions exclusively mediated by fast brain oscillations (beta, 13-30 Hz) together with a decrease of FC in the frontal network driven by slow oscillations (delta, 1-4 Hz, theta,4-8 Hz). Our results indicate that a dynamic antagonist relationship between the brain networks of automatic and controlled processes may serve as a hallmark of statistical learning.

**A-0647 Differential temporal dynamics of frontal theta during encoding and maintenance in a working memory task**

Kathrin C. J. Eschmann [1,2], Regine Bader [2], Axel Mecklinger [1,2]
[1] International Research Training Group "Adaptive Minds" (GRK 1457); [2] Experimental Neuropsychology Unit, Saarland University, Saarbrücken, Germany

Frontal theta oscillations are claimed to be a neural mechanism reflecting cognitive control processes. However, previous research failed to show differences in frontal theta power between working memory conditions that vary in cognitive control, which might be due to neglecting fine grained temporal dynamics. The present study investigated temporal dynamics of frontal theta oscillations during encoding and maintenance in a working memory task, in which participants either had to retain or manipulate stimuli. In the retention condition theta power was larger during encoding whereas in the manipulation condition theta power was enhanced at a later maintenance stage. This indicates that temporal dynamics have to be taken into account when investigating theta as a correlate of cognitive control processes.

**A-0649 Anodal stimulation of the left dorsolateral prefrontal cortex disrupts statistical learning**

Orsolya Pesthy [1], Kata Horváth [1,2], Csenge Török [1,2], Balázs Török [3], Karolina Janacsek [1,2], Dezso Nemeth [1,2]
[1] Institute of Psychology, Eötvös Loránd University, Budapest, Hungary [2] MTA-ELTE NAP B Brain, Memory and Language Research Group, Institute of Cognitive Neuroscience and Psychology, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary; [3] Department of Cognitive Science, Budapest Institute of Technology and Economics, Budapest, Hungary

Statistical learning is crucial in everyday life; it underlies the acquisition of motor, cognitive, as well as social skills. Previous studies highlighted the supporting role of the right dorsolateral prefrontal cortex (DLPFC) in this process; however the role of the left DLPFC remained controversial. In the present study we investigated the effect of left, right and sham anodal transcranial direct current stimulation (tDCS) of the DLPFC on a probabilistic sequence learning task which was performed by healthy young adults. We found that stimulation over the left hemisphere disrupted learning compared to both sham and right stimulation. This result is in line with previous findings highlighting an interhemishperic asymmetry in the role of the DLPFCs in statistical learning.

**A-0666 The Effects of Parent-Child Conversation on Children's Memory for a Science Lesson**

Michelle D. Leichtman, Kaitlin A. Camilleri, David B. Pillemer, Carmela Amato-Wierda, Melissa D. Dongo
University of New Hampshire, Durham, New Hampshire, USA

A scientist taught forty 4- to 6-year-old children an interactive science lesson at school. The same day, children talked about the lesson at home with a parent who was naïve to the details of what had transpired at school. Six days later, a researcher interviewed children about objects, activities, and concepts that were part of the lesson. Aspects of parents' conversational style (e.g., open-ended memory questions, descriptive language) predicted how much information children provided in talking with them, which in turn predicted children's memory performance six days later. The findings suggest that elaborative parent-child conversations at home may boost children's retention of information acquired at school, even when parents have no specific knowledge of what children have experienced there.

**A-0692 The effect of closeness to another on the self-reference effect**

Yi-Jhong Han [1], Daisy Yip [2], Leun J Otten [1]
[1] Institute of Cognitive Neuroscience, University College London (UCL), London, UK; [2] Medical School, University College London (UCL), London, UK

Memory tends to be better for information that pertains to the self. In two experiments, the effect of interpersonal closeness on this self-reference effect was investigated. Healthy adult volunteers judged how consistent trait adjectives were to themselves or others and then performed a recognition memory test on the adjectives. The first experiment established superior memory for self-referenced adjectives relative to adjectives judged in relation to a close or distant other. The second experiment replicated this memory advantage, and demonstrated qualitatively different retrieval mechanisms for the self versus a close other in electrical brain activity. These findings suggest the self has a distinct role in memory that cannot easily be explained by interpersonal closeness.

**A-0721 Mixing up the Script: A Reminiscence Bump for Bittersweet Emotional Events**

Karalyn F. Enz [1,2], David B. Pillemer [1], Jennifer M. Talarico [2]
[1] University of New Hampshire, Durham, NH, USA; [2] Lafayette College, Easton, PA, USA

The reminiscence bump, a tendency for adults to recall more events from young adulthood than any other period, is more prominent for positive than for negative events, perhaps because recall is directed by a cultural life script comprised of landmark positive events. Recall of emotionally mixed, or bittersweet, events across the lifespan has not yet been studied. We compared the distribution of older adults' bittersweet memories to a distribution of typical bittersweet events generated by college students. Whereas older adults' memories showed the strongest reminiscence bump for events that were rated similarly on positive and negative emotions, college students' hypothetical events peaked most strongly for events rated as more positive than negative. Implications for cultural life script theory are discussed.

**A-0744 Social Data Analytics and Memory**

Jeffrey L. Foster
Western Sydney University, AUS

The last 10 years has seen an explosion of people utilizing social media, leading to vast amounts of accessible data amongst a truly global population of people. But while many studies have utilized these large datasets, few have done so in the light of memory research. Utilizing topic hashtags, geotags and the ability to contact social media users via the platform allows opportunities for memory research as well. In this poster, I'll demonstrate a variety of methodologies for utilizing big social data analytics for memory researchers with social media platforms like Twitter and Instagram. It will discuss both the benefits and drawbacks of utilizing such a large set of both data and contacts for memory research.

**A-0747 Hidden covariation detection under social influence**

Nadezhda Moroshkina, Anatoliy Karpov
St. Petersburg State University

The process of hidden covariation detection (Lewicki, 1986) was investigated in the situation where opinion of other people serves as the source of information. Participants were presented with girl's photos and their IQ scores obtained either from tests or from other people' opinion. The hidden covariation between the type of haircut and IQ level was inserted in stimuli presentation. Results show that people unconsciously learn the hidden covariation between the type of haircut and IQ level and apply this rule in estimation of new girls. Thus we received an experimental verification that other people opinion can help forming hidden perceptual categories. The study is supported by RFH grant # № 15-36-01355

**A-0819 VSTM capacity, filter efficiency and fluid abilities**

Florian Domnick [1,2], Nicolas Becker [1], Hubert D. Zimmer [2], Frank M. Spinath [1]
[1] Differential Psychology and Psychodiagnostics, Saarland University, Saarbrücken, Germany [2] Brain & Cognition Unit, Saarland University, Saarbrücken, Germany

Visual short-term memory (VSTM) capacity and fluid abilities (gF) are strongly interconnected. In addition, storing information efficiently by filtering out irrelevant information is essential for VSTM but its influences on gF are less investigated. In this study, we investigated the impact of filtering on gF when VSTM capacity is taken into account. We applied change detection tasks with and without filtering demands to estimate VSTM capacity and filtering besides gF tasks. Results reveal that filtering is connected to VSTM capacity. Additionally, VSTM capacity shares significant variance with gF. However, filtering is barely related to gF, leading to the assumption that filtering plays a crucial role in storing information efficiently in VSTM but has no unique contribution to gF.

**A-0840 Hippocampal and striatal involvement in cognitive tasks: a computational model**

Fabian Chersi, Neil Burgess
Institute of Cognitive Neuroscience, UCL, London, UK

The hippocampus and the striatum support episodic and procedural memory, respectively, and 'place' and 'response' learning within spatial navigation. Recently this dichotomy has been linked to 'model-based' and 'model-free' reinforcement learning. Here we present a well-constrained neural model of how both systems support spatial navigation, and apply the same model to more abstract problems such as sequential decision making. In particular, we show that if a task can be transformed into a Markov Decision Process, the machinery provided by the hippocampus and striatum can be utilized to solve it. These results show how the hippocampal complex can represent non-spatial problems, including context, probabilities and action-dependent information, in support of 'model-based' reinforcement learning to complement learning within the striatum.

**A-0855 A Cross-Cultural Examination of the Conformity Effect When Witnessing a Crime**

Sungil Bang [1], Charles B. Stone [1,2]
[1] John Jay College of Criminal Justice, City University of New York; [2] The Graduate Center, City University of New York

Research has shown that discussions with a co-witness can lead to the spread of false information about a crime scene, also known as the social conformity effect. However, much of this research has focused primarily on Western cultures. Given the cultural differences between East and West cultures in terms of interdependence and independence, the present study examined whether the social conformity effect may be exacerbated within Eastern cultures. Participants recruited from the US and South Korea watched videos of a crime, including different details. Half of the participants either discussed the video or they did not. The results are discussed in terms of the importance of cultural variables in understanding the mnemonic consequences of discussing a crime with a co-witness.

**A-0875 Effects of Honor Activation and Endorsement on Gender-Defining Memories**

Merve Mutafoğlu, S. Adil Sarıbay
Boğaziçi University, Istanbul, Turkey

Culture influences autobiographical remembering, however, no previous study examined autobiographical memory narratives through the lens of an honor culture. This study investigated the effects of activation of honor-related schemas, honor endorsement, and gender on autobiographical memories of Turkish participants. We primed honor by using honor-related words in honor condition (vs. neutral words in control condition) in a scrambled sentences task, then asked participants to report one gender-defining memory. Results revealed that men in honor condition gave more memories that include honor-enhancing and honor-attacking themes, compared to men in control condition. In addition, women in honor condition were more likely to report memories from an observer perspective as their honor endorsement scores increase, compared to men in honor condition.

**A-0881 Episodic memory helps belief updating in 36-month-olds but not in 18-month-old infants**

Ildikó Király[1,2], Kata Oláh[1], Ágnes Kovács[2], Gergely Csibra[2]
[1]Eötvös Loránd University, Budapest; [2]Central European University, Budapest

We propose that the availability of episodic memory on a recent event makes belief attribution flexible: maintaining representation of past events allows updating others' beliefs. We tested 18 and 36-month-olds in a location-change task (Southgate et al., 2010). The model was present during a location-change event wearing sunglasses. However, after the model had left, children learnt about her sunglasses: they were either opaque (FB-condition) or not (TB-condition). We proposed that if children update the belief content of the model based on this information, they should give the requested object in the TB and the other one in the FB-condition. Our results revealed that 36-month-olds were able to use recollection of a previous event to update the attributed belief.

**A-0909 Autobiographical memories of important life story events in Mexico, Greenland, China, and Denmark**

Alejandra Zaragoza Scherman [1], Sinué Salgado [1], Zhifang Shao [2], Dorthe Berntsen [1]
[1] Center on Autobiographical Memory Research (CON AMORE), Department of Psychology and Behavioural Sciences, Aarhus University, Aarhus, Denmark; [2] School of Psychology and Cognitive Science, East China Normal University, Shanghai, China

Individuals often think and talk about autobiographical memories of important life events from their personal past. Do these life events differ across cultures? In this study, researchers asked participants from Mexico, Greenland, China, and Denmark to recall seven autobiographical memories of important personal life story events. In addition, participants indicated how often they think or talk about the reported events. The common important life events recalled by participants from all four cultures were having children, getting married, attending college, having a job, experiencing someone’s death, traveling, and getting a divorce. Results showed cross-cultural differences in the percentage of participants that recalled each life event as well as in the ratings for how often they think or talk about each event.

**A-0952 Computational constraints on the dynamics of memory from open hypothesis spaces**

David G. Nagy [1,2], Gergo Orban [1]
[1] MTA Wigner Research Centre for Physics, Budapest, Hungary; [2] Institute of Physics, Eötvös Loránd University, Budapest, Hungary

Learning in complex environments places severe demands on long-term memory, since it can be shown to require either storing a lifetime’s worth of experience or tracking a large or infinite number of competing hypotheses about how the environment works. Assuming that long term memory is adapted to the task of model learning, this challenge leads to a lossy compression of observations which implies the presence of memory biases. In this computational analysis we formalise learning tasks in a probabilistic inference framework and show that i) semantic memory alone is insufficient for enabling model change; ii) optimising what to remember and what to forget for model selection leads to a loss of detail and a bias towards retaining surprising experiences.

**A-1059 Who Can You Trust?**

Gene Brewer, Chris Blais, Kim Wingert, Derek Ellis, Adam Cohen
Arizona State University, Tempe, USA

Research in our laboratory has focused on perceptual and mnemonic features that influence perceptions of trustworthiness and decisions to trust. We will present behavioral and EEG data from an implicit learning task where participants engaged with confederates that were either trustworthy or untrustworthy. Across trials, the features of the confederate and memories for repeated interactions with the confederate combined to influence decisions to trust a reported outcome of a coin flip. Behaviorally, subjects probability matched and chose to trust the reported coin flips from trustworthy and untrustworthy confederates equally (66.2% vs. 65.9%, respectively, n.s.). Electrophysiologically, there were reliable differences in the pattern of oscillatory activity in the alpha band (8-13Hz) over parietal electrode sites 1-3 s prior to their trust decision. This finding is consistent with the interpretation that subjects were actively maintaining a “trust” mental set for trustworthy individuals and a “distrust” mental set for untrustworthy individuals. This differential activity (trust minus distrust) also predicted the number of trust decisions made (r = -.65, p

**A-0854 Flexible use of category representations**

Caitlin R. Bowman, Dagmar Zeithamova
University of Oregon

Whether individuals represent categories as a set of individual exemplars (exemplar models) or as the central tendency of the category (prototype models) has been a source of considerable debate. We hypothesized that individuals can form both types of representations and deploy them based on task demands. Participants were trained on different sets of exemplars designed to vary the difficulty of forming exemplar and prototype representations. High variability between exemplars led to stronger exemplar representations. Lower exemplar variability resulted in stronger prototype representations. Training was followed by recognition and categorization tests. Prototype model fits were better during categorization but not during recognition. Together, results indicate that individuals form and flexibly use both prototype and exemplar representations depending on task context.

# The multifaceted role of the ventromedial prefrontal cortex (vmPFC) in memory and decision making

**S0002 session**
Monday, 18 July 2016 | 13:00 - 15:00 | Room 1
**Chair/Organizer: Asaf Gilboa**
**Discussant: Morris Moscovitch**

**A-0258 Does the medial prefrontal cortex help us to optimize schemata usage in a changing world?**
Adam Santoro [1,2,3], Paul Frankland [1,2,4,5], Blake Richards [6,7]
[1] The Hospital for Sick Children, Toronto, Canada [2] Institute of Medical Sciences, University of Toronto, Toronto, Canada [3] DeepMind Technologies, London, UK [4] Department of Psychology, University of Toronto, Toronto, Canada [5] Department of Physiology, University of Toronto, Toronto, Canada [6] Department of Biological Sciences, University of Toronto Scarborough, Toronto, Canada [7] Department of Cell and Systems Biology, University of Toronto, Toronto, Canada
Studies show that the medial prefrontal cortex (mPFC) is important for incorporating new information into schemata. However, in a dynamic environment previous experiences do not always apply to new situations, so schemata are not always useful. Here, we will present water-maze data demonstrating that inhibition of principal cells in the mPFC of mice affects the recall of new memories—but only if the new information is in statistical conflict with consolidated memories. We can recapitulate these findings in a neural network model, wherein the mPFC uses previous experience to determine when to rely on schematic or episodic memories. We propose that an evolutionarily ancient function of the mPFC is to guide schemata usage intelligently in a changing world.

**A-0039 Hippocampal-medial prefrontal contributions to memory representation and restructuring**
Alison Preston
The University of Texas at Austin, Austin, TX, USA
Everyday behaviors require that we flexibly use prior knowledge to inform action in new situations. In this talk, I will discuss how such flexibility emerges through memory integration processes supported by a hippocampal–medial prefrontal (mPFC) circuit, whereby related memories become interconnected through recruitment of overlapping neural representations. Specifically, I will show that hippocampal-mPFC coupling during encoding of new events that overlap with existing knowledge reflects a memory-by-memory updating process. Furthermore, I will show that hippocampal-mPFC coupling during rest periods following memory updating reflect continued restructuring of interrelated memories during offline periods. Finally, I will discuss how memory restructuring impacts the representation of memory elements within hippocampal and mPFC subregions, resulting in integrated memories that represent the similarities among events.

**A-0021 Is there an alternative route into long-term memory?**
Guillén Fernández
Donders Institute for Brain, Cognition and Behavior, Radboud University Medical Center, Nijmegen, The Netherlands
The hippocampus and neighboring structures are regarded essential for long-term memory formation allowing us to remember past experiences and to retrieve acquired knowledge. However, recent evidence cast doubts on this hippocampal exclusivity. There is initial support for a model in which hippocampal and medial prefrontal contributions to memory formation are dynamically balanced depending on the ease by which new information can be integrated into existing knowledge structures (i.e., schemas). I will present fMRI studies probing schema-related memory formation and retrieval at the level of local activity, multi-voxel activity pattern and network properties. Results suggest that the medial prefrontal cortex links, during schema encoding, consolidation and retrieval, representations in posterior brain areas, potentially forming the brain-basis of knowledge.

**A-0032 Medial prefrontal contributions to the development of metamnemonic monitoring and control**
Yana Fandakova, Simona Ghetti
Center for Mind and Brain and Department of Psychology, University of California, Davis
Children's ability to introspect on uncertainty and control memory retrieval continues to develop during late childhood. We will demonstrate that during childhood (8–14 years), uncertainty signals in insular and cingulate regions foster fronto-parietal engagement in the evaluation of uncertainty and the decison to withhold or volunteer a memory, both longitudinally (ca. 1.4 years) and on a trial-by-trail basis. We will focus on structural and functional development of medial frontal regions, and their role for facilitating children's regulation of memory retrieval. Finally, we will show that children's ability to recognize and regulate uncertainty in memory outcomes contributes to present and future memory performance, and that regions underlying uncertainty signaling and evaluation work dynamically to support memory development.

**A-1014 The primate VMPFC: building a cognitive representation of goal value**
Aurore San-Galli, Chiara Varazzani, Mathias Pessiglione, Sebastien Bouret
Team Motivation Brain & Behavior CNRS/INSERM/ICM Paris, France
The primate ventro-medial prefrontal cortex (VMPFC) is involved in value-based decision making, but its specific contribution remains unclear. Based on behavioral and neurophysiological data in rhesus monkeys, we show that the VMPFC is critical when monkeys need to build an internal representation of rewards to guide action. More specifically, VMPFC activity reflects a cognitive construct that drives goal directed behavior irrespectively of immediate changes in the environment. By comparison, dopamine and OFC neurons are more strongly involved when behavior relies on stimulus-response processes. We will discuss the potential implication of these data for understanding the potential role of VMPFC and associated temporal lobe structures in foraging.

**A-0020 vmPFC, memory decision-making and schemas: Evidence from confabulation and electrophysiology**
Asaf Gilboa [1,2,3]
[1] Rotman Research Institute at Baycrest, Canada; [2] Department of Psychology, University of Toronto, Canada; Canadian Partnership for Stroke Recovery, Canada.
Confabulation research suggests that vmPFC damage causes impaired automatic 'felt rightness' monitoring. The vmPFC has also been implicated in decision-making and reward, and more recently in schema-mediated memory functions. These seemingly disparate functions can be reconciled. (i) The vmPFC is critical for instantiating contextually relevant schemas by biasing posterior long-term representations. (ii) Assessing memory veracity involves automatic valuation-like processes where retrieved content is juxtaposed with currently activated schemas: close matches yield

phenomenal “felt rightness”. (iii) Memory control involves choosing whether to act based on retrieved memories (e.g. volunteer an answer), similar to choice in decision-making. Memory monitoring and memory control map onto valuation and choice, and are mediated by subcallosal vmPFC and to posterior medial orbitofrontal cortex, respectively.

**A-0034 What are the critical vmPFC contributions to value-related learning in humans?**

Lesley K Fellows
Montreal Neurological Institute McGill University Montreal, Canada

VmPFC has been repeatedly implicated in reward learning and decision-making, based on evidence from animal models and converging methods in humans. This talk will summarize studies of patients with focal vmPFC damage that make the case that vmPFC plays a necessary role in establishing a flexible, context-specific model of the reward-predicting features of the environment at any given moment. This model may serve as an attentional filter, focusing visual processing on motivationally relevant features and setting up outcome expectancies that are critical in learning from reward under specific conditions, notably reversal learning. Possible links between this reward-learning conception of vmPFC function and ideas about the role of this region in prospective memory will be discussed.

# Autobiographical memory I

**I041 session**

Monday, 18 July 2016 | 13:00 - 15:00 | Room 2

**Chair/Organizer: Martin A. Conway**

**A-0030 Individual differences in autobiographical memory: Exploring the neural and behavioural correlates**

Signy Sheldon [1] , Brian Levine [2]

[1] McGill University, Montreal, Canada, [2] Baycrest Health Sciences, Toronto, Canada

A major question in autobiographical memory research is how individual differences in approaches to remembering affect the underlying neurocognitive processes. One prominent form of memory variability is the tendency to use rich vivid images to recollect the past versus the tendency to recall events on an implicational level. I will present neuroimaging evidence that suggest that differences in these tendencies relates to predictable connectivity patterns of the medial temporal lobe (MTL) memory system and hippocampal subregion volumes. I will also present behavioral evidence to suggest that individual differences in imagery ability mediate the use of MTL memory processes when recalling events. Together, these studies advocate for the inclusion of individual differences in memory strategies when studying autobiographical memory.

**A-0117 The bi-directional relationship between autobiographical memory and the self in depression.**

Lydia Grace, Rachel Anderson, Stephen Dewhurst

University of Hull, UK

Biases in autobiographical memory (ABM) and self-concept have been implicated in depression. Despite cognitive theories suggesting a bi-directional relationship between these two factors, they are rarely investigated together within the context of depression. Two experiments examined the nature of the bi-directional relationship between ABM and the self, using dysphoric and non-dysphoric students. Experiment 1 investigated the effects of recalling past positive and negative events on self-identity, whilst experiment 2 investigated the accessibility and phenomenological characteristics of the ABMs that support important self-concepts. Findings indicate that the presence of dysphoric symptoms alters the relationship between ABMs and the self. Findings are discussed in the context of how such biases, and the interaction between them, may serve to maintain depressive symptomatology.

**A-0251 An autobiographical gateway: Mnemonic visual perspective and narcissistic versus genuine self-esteem**

Marta Marchlewska [1], Aleksandra Cichocka [2]

[1] Institute for Social Studies, University of Warsaw; [2] School of Psychology, University of Kent

We examined the retrieval of self-threatening autobiographical memories among individuals with narcissistic versus genuine self-esteem. Because narcissism is linked to sensitivity to threat, it should predict retrieval of self-threatening memories using a third-person perspective. Genuine self-esteem is resilient to threats. Therefore, it should be associated with retrieving self-relevant, even if threatening, memories from the first-person perspective. In Experiment 1, narcissism predicted employing third-person perspective in self-threatening memories, while self-esteem predicted first-person perspective in self-relevant threatening and boosting memories. In Experiment 2, narcissism predicted third-person perspective, while self-esteem predicted first-person perspective for self-threatening memories (but not for non-relevant negative memories). Results shed light on the role of self-evaluation and ego threats in triggering different modes of processing autobiographical memories.

**A-0372 Flashbulb and Event Memories for 9/11: Examining the Elderly in a 10-Year Longitudinal Study**

Robert Meksin, William Hirst

New School for Social Research, New York, USA

Using data from a ten-year longitudinal study of flashbulb and event memories of the 9/11 attacks (Hirst et al., 2015), we report on the performance of the 21 participants 65 or older at the time of the attack. This older sample initially formed flashbulb and event memories comparable to the younger sample. In both samples, flashbulb memories were preserved over the ten-year period, with inconsistencies repeated. Event memories showed greater decline in the older sample. Those between 65-70, at the time of the attack, benefited from media exposure about 9/11 over the ten years, but those over 70 did not. The role of external influence in preserving memories in the elderly is discussed.

**A-0513 Intentionally Fabricated Autobiographical Memories**

Lucy V. Justice [1], Catriona M. Morrison [2], Martin A. Conway [3]

[1] Nottingham Trent University, Nottingham, UK; [2] University of Bradford, Bradford, UK; [3] City University, London, UK

The processes underlying the generation of truthful (AMs) and intentionally fabricated autobiographical memories (IFAMs) were investigated. Memories of everyday events were constructed while a concurrent memory load (random 8-digit sequence) was held in mind or while there was no concurrent load. Participants recalled fewer digits of the concurrent memory load and were less accurate while generating an IFAM, indicating that IFAMs can be identified indirectly by lowered performance on concurrent tasks that increase cognitive load. IFAMs were created by recalling and then “editing” true memories, explaining the increased cognitive effort required. A number of phenomenological and linguistic differences were also found between memory types. These findings show systematic differences that mark out IFAMs and establish the process underlying IFAM generation.

**A-0578 Autobiographical Memory Specificity and Detail: Differential Associations with Adolescent Psychopathology across 3 Years**

Charlotte Gutenbrunner, Karen Salmon, Paul Jose

Victoria University of Wellington, Wellington, New Zealand

The current study investigated longitudinal associations between autobiographical memory and psychopathology in adolescents. Research with adults suggests that autobiographical memory specificity and detail may be distinct constructs that relate differentially to psychological well-being. In typically-developing youth, such associations have not been examined longitudinally. Therefore, the current study investigated whether psychopathology in young people would associate differentially with specificity of autobiographical memories compared to level of memory detail. Across three annual data collection waves, 269 adolescents (10-15 years old) completed a cued-recall autobiographical memory retrieval paradigm and self-report measures of depression, rumination and anxiety. Analysis of longitudinal relationships between psychological well-being and different qualities of autobiographical memories have implications for our understanding of the association between memory and early psychopathology emergence.

**A-0582 The influence of selective discussion on children's autobiographical memory recall.**

Ruth Glynn, Karen Salmon, Jason Low
Victoria University of Wellington, Wellington, New Zealand

Talking with children about their experiences has positive outcomes for how events are later remembered (Fivush, Haden, & Reese, 2006). These conversations are selective; some events are discussed while others are omitted. The retrieval-induced forgetting (RIF) paradigm (Anderson, Bjork, & Bjork, 1994), enables investigation of the impact of these omissions on children's recall. Sixty-five children (8-9 years) completed an adapted RIF paradigm for autobiographical memory (Storm et al., 2013). Selective discussion of some events led to forgetting of non-discussed events of the same valence relative to events of a different valence, replicating findings with adults (Barnier, Hung, & Conway, 2004). Findings will be discussed with particular reference to the impact of selective discussion on the quality and quantity of recall.

# Exceptional Memory Abilities

**S0022 session**

Monday, 18 July 2016 | 13:00 - 15:00 | Room 3

**Chair/Organizer: Martin Dresler, Boris Konrad**

**A-0357 Exceptional Autobiographical Memory**

James L. McGaugh
Department of Neurobiology and Behavior Center for the Neurobiology of Learning and Memory University of California, Irvine California, USA

I will discuss the findings of studies of individuals who have highly superior autobiographical memory (HSAM). These subjects are able to report the day of the week for any day of their life, after approximately the age of 10, and correctly report personal and public events that occurred on that day. They are, however, not superior on laboratory learning and memory tests. MRI scans suggest that several brain regions of HSAM subjects differ from those of age and sex matched controls. Evidence that HSAM subjects differ from controls in obsessive behavior may offer some insights into the bases of this extraordinary memory ability.

**A-0279 The SuperAging Study: Neurobiologic factors coupled with unusually high episodic memory over age 80**

Emily J Rogalski, Tamar Gefen, Amanda Cook, Eileen H Bigio, Emmaleigh Loyer, Sandra Weintraub, Changiz Geula, M.- Marsel Mesulam
Northwestern University Feinberg School of Medicine

The Northwestern SuperAging study demonstrates that it is possible for individuals over age 80 to have memory performance at least as good as individuals in their 50s and 60s, dispelling the notion that lower memory performance over age 80 is an unavoidable consequence of aging. This session will summarize the neurobiologic and psychosocial features associated with cognitive SuperAging. Understanding the biologic factors associated with this rare cognitive phenotype may inform approaches for avoiding disease and disability and maximizing quality of life in aging.

**A-0599 Enhanced and Exceptional Memory in Synaesthesia**

Jamie Ward
University of Sussex, UK

People with synaesthesia have unusual perceptual experiences, the most commonly studied being verbal material evoking colours. These synaesthetes have enhanced memory abilities on a wide range of tasks, and for both verbal material (that triggers synaesthesia) and for visual material (that does not). A series of investigations will be reported that explore the origins of this ability. The benefits are largely independent of encoding strategy suggesting a ‘natural’ advantage with a medium effect size. However, some synaesthetes are able to augment this advantage with effective strategies to obtain exceptional performance, and synaesthetes are over-represented amongst these high achievers (including memory athletes and autistic savants).

**A-0558 Exceptional memory in chess**

Fernand Gobet
University of Liverpool, Liverpool, United Kingdom

A substantial amount of what we know about expertise comes from research on chess players. In particular, several aspects of expert memory have been uncovered in this line of research, such as the importance of chunks and templates. In this talk, I’ll present two remarkable feats of memory shown by chess players: The ability to play blindfold chess, even against several opponents, and the ability to memorise several briefly presented chess boards. The cognitive mechanisms allowing these achievements will be discussed in the framework of a computational cognitive architecture (CHREST – Chunk Hierarchies and REtrieval STructures).

**A-0607 Memory and Savant Syndrome**

Julia Simner, James E. A. Hughes
University of Sussex, Brighton, UK

Savants show prodigious talent, often memory-linked, along with developmental disabilities such as autism spectrum conditions (ASC; Treffert, 2010). We previously proposed savant skills may arise in ASC individuals who have synaesthesia (e.g., Simner et al., 2009), a condition linked with superior memory. An unrelated claim is that ASC significantly co-occurs with synaesthesia (e.g., Neufeld et al., 2013). We asked whether synaesthesia occurs more often in autism per se, or only in autism-accompanied-by-savant-skills. We tested ASC-individuals with/without savant skills, and non-ASC controls. Synaesthesia was significantly higher in people with ASC, but only those with savant skills. We also show savants have higher obsessional traits than non-savant ASC individuals and suggest prodigious memory bootstraps from synaesthetic advantages heightened through elevated obsessing.

**A-1066 Studies of exceptional memory in the China Super Brain project**

Weidong Li
Shanghai Jiao Tong University, China

We helped to design the 1st season of the Super Brain TV program in China, which became one of the most popular Chinese TV shows and also aroused strong repercussions in brain science in China. We therefore set up the China Super Brain Project and recruited the people with exceptional brain abilities for systematic scientific investigations. Here, we report EEG, fMRI, and MRI results for the superior mnemonists in our project.

**A-0260 Varieties of Superior Memory Ability**

Henry L. Roediger III [1], David A. Balota [1], Kathleen B. McDermott [1], John F. Nestojko [1], Mary Pyc [2]
[1] Washington University in St. Louis; U.S.A. [2] Dart NeuroScience; San Diego, CA

This symposium makes clear that several types of superior memory exist. My presentation reports on a large scale project in which different types of expert memorizers are compared and contrasted on a battery of cognitive tasks to address the issue of whether some common set of abilities may underlie performance in widely different domains (e.g., mnemonists or memory athletes, crossword puzzle experts, trivia champions, memorizers of large numbers of Bible verses, people with highly superior autobiographical memory, among others). Early evidence suggests that each type of exceptional memorizer may have distinctive attributes.

**A-0622 Functional and structural brain reorganization in memory champions**

Nils Müller
Donders Institute for Brain, Cognition and Behaviour

Through deliberate training in mnemonic strategies, participants of the annual World Memory Championships exhibit exceptional memory performance. However, whether this performance is accompanied by structural and functional reorganization of the cortex is still unknown. We compared a sample of 23 of the world's top 50 memory athletes to carefully matched controls. Combining volumetric methods with resting state analysis, we find that the anterior part of the right hippocampus is larger and more strongly functionally connected to other brain regions in memory athletes. Complementary, we present distributed grey matter reorganization identified by a whole brain classification analysis.

## Social memory and group synergy: What individuals bring to, do in and get out of collaborative memory groups

**S0039 session**
Monday, 18 July 2016 | 13:00 - 15:00 | Room 4
**Chair/Organizer: Amanda J. Barnier**
**Discussant: John Sutton**

**A-0364 Selective forgetting following selective remembering: The role of communicators' social presence**
William Hirst, Martin Fagin
New School for Social Research, New York, USA
Conversational remembering is usually selective, which, in turn, produces selective forgetting in both speakers and listeners. With this socially shared retrieval-induced forgetting (SSRIF), unmentioned memories related to mentioned ones are subsequently more likely to be forgotten than unmentioned, unrelated memories. Although videotapes of speakers, as well as face-to-face encounters, will produce SSRIF in listeners, we report experimental results showing that SSRIF depends on there being an identifiable "socially present" person behind a communication. Participants heard/read communications with or without a picture of the communicator, as well as communications told in the first- or third-person. SSRIF was observed only when a communicator was socially present. The results are discussed in terms of collective memory and modes of communication.

**A-0365 The mnemonic and decision-making consequences of selective retrieval during jury deliberations**
Charles B. Stone [1], William Hirst [2], Robert Meksin [2]
[1] The City University of New York, New York, USA, [2] New School for Social Research, New York, USA
Juries play a crucial role in the American justice system. Juries are tasked with observing a trial, deliberating about the facts of said trial and coming to a decision of guilty or not guilty. Given their critical role, it is imperative to understand how jurors come to their decisions in order to ensure their decisions are as accurate as possible. Using the socially shared retrieval-induced forgetting paradigm, the present study examines the role that selective retrieval plays in shaping jurors' discussion during deliberation and, in turn, their verdicts. Our results are discussed in terms of the importance of understanding the mnemonic and decision-making consequences of jury deliberation.

**A-0366 Memory conformity: Evidence for differential processing of information dependent on source**
Fiona Gabbert, Alessandra Caso, Diego Nardi
Goldsmiths University of London, London, England
Findings from memory conformity research suggest that people often selectively use other people's memory as source of additional information to complete their own. We examined this using a standard memory conformity paradigm where dyads encoded slightly different versions of the same stimuli. In a 2 (partner: friend, stranger) x 2 (perceived encoding duration: half the time as partner, twice the time as partner) mixed design (partner as within subjects variable), we found that participants conformed more to friends than strangers. Furthermore, in a surprise memory test about the joint discussion, participants remembered more details previously reported by friends than strangers.

**A-0367 Risk perception affects mnemonic convergence in small groups of interacting individuals**
Alin Coman, Ajua Duker
Princeton University, New Jersey, USA
Information about epidemics propagates through communities as they learn about new diseases. Here, we report results on how manipulated risk of infection affects mnemonic convergence in 6-member, lab-created, communities. We first present participants with an article containing informational and emotional content about a known disease. We then ask them to individually remember the information, then have sequential dyadic interactions to jointly remember the information, and then, again, to individually remember the information. Pre and post-conversational convergence measures revealed that high-risk communities converge equally on informational and emotional content, while low-risk communities initially converge on, talk about, and finally converge on emotional information to a larger extend than on informational content. We discuss the implication of these findings for public health.

**A-0369 Social transmission of emotional memories**
Hae-Yoon Choi [1], Elizabeth A. Kensinger [2], Suparna Rajaram [1]
[1] Stony Brook University, New York, USA, [2] Boston College, Massachusetts, USA
We investigated whether the valence of memories (negative, positive, or neutral) and the extent to which people share these original experiences change the transmission of memory across networks with different group structures (small, identical groups or larger, reconfigured groups). After individually studying negative, neutral and positive picture-word pairs, participants completed one of three consecutive recall sessions: Individual–Individual–Individual (Control), Collaborative–Collaborative (Identical group)–Individual, and Collaborative–Collaborative (Reconfigured group)–Individual. We will discuss emotional memory findings in the context of exposure during collaboration to overlapping or unshared encoded information and working with the same or different partners. The goal of this study is to identify circumstances under which the transmission of emotional memories is boosted or attenuated.

**A-0370 Collaborative prospective memory in strangers and couples: Identifying successful collaborative processes**
Catherine Browning [1], Celia Harris [1], Amanda Barnier [1], Peter Rendell [2]
[1] Macquarie University, New South Wales, Australia, [2] Australian Catholic University, Australian Capital Territory, Australia
Prospective memory (PM) is memory for activities to be performed in the future and is frequently undertaken within social interactions. In two experiments using the collaborative recall paradigm, we explored PM performance within young-adult stranger-pairs (Experiment 1) and within young-adult intimate-couples (Experiment 2) collaborating on the "Virtual Week" task. Although stranger-pairs showed the typical collaborative inhibition effect seen in episodic recall, intimate-couples showed no collaborative inhibition. We analysed and coded the session transcripts to identify memory processes that distinguished strangers' and couples' PM performance. We found that conversation between intimate-couples (with established rapport) seemed to provide more effective monitoring and retrieval of PM intentions and was delivered at sensitive time-points to avoid distraction and subsequent disruption of PM task performance.

**A-0371 More than the sum of their parts: What individuals bring to group memory**

Amanda J. Barnier, Celia Harris, Thomas Morris, Gregory Savage
Macquarie University, New South Wales, Australia

Understanding collaborative memory requires nuanced measurement of the (sometimes) idiosyncratic profiles of what individuals bring to, do in and get out of groups. Although we typically count group performance as better or worse than the sum or average of its parts, sums and averages can miss subtleties of group process and product. We report two collaborative recall experiments with long married, elderly couples recalling names of friends and acquaintances either alone or together. To tell a richer story of the individual and joint processes that give rise to group memory performance, we track and describe patterns of: individual and group performance (amount recalled and accuracy); discrepancies across individuals in ability or expertise; and couple-level communicative strategies, turn-taking and scaffolding.

# Working memory I

**I081 session**

Monday, 18 July 2016 | 13:00 - 15:00 | Room 5

**Chair/Organizer: Richard Allen**

**A-0017 Large capacity temporary memory and interference**

Ansgar Endress

City University London, UK

Working memory (WM) is thought to have a capacity of 3 or 4 items. These capacity limitations are believed to reflect the limitations of active maintenance mechanisms. Here, I show that we also have a form of memory for briefly storing meaningful items with a large capacity (that is distinct from sensory memory), and that traditional WM capacity limitations arise only in the presence of massive proactive interference. Mathematical analysis shows that interference guarantees fixed and finite memory capacity limitations under extremely general conditions, even in the absence of active maintenance mechanisms. Further, I show that the cost of interference is relatively constant across experimental conditions, which in turn might lead to relatively constant memory capacity limitations.

**A-0072 the effects of refreshing opportunities and cognitive load on episodic memory and working memory**

Anne-Laure Oftinger [1], Vanessa Loaiza [1,2], Valerie Camos [1]

[1] University of Fribourg, Switzerland; [2] University of Essex, UK

Attentional refreshing has received considerable attention for its relevance for both episodic memory (EM) and working memory (WM). While studies on WM manipulated the cognitive load of the concurrent task in complex span tasks, other studies examined the consequences of refreshing opportunities during complex span tasks on EM. The current experiments orthogonally manipulated cognitive load and refreshing opportunities in complex span tasks to examine recall from WM and EM. The results indicated overall effects of cognitive load on WM and EM, whereas refreshing opportunities only affected WM in the low load condition of Experiment 1. This suggests that varying cognitive load is a more powerful manipulation of attentional refreshing than refreshing opportunities.

**A-0112 Current and future predictors of mathematics ability: The effect of time-constraints in working memory span tasks.**

Rebecca A Gordon [1], James H Smith-Spark [1], Elizabeth J Newton [1], Lucy A Henry [2]

[1] London South Bank University; [2] City university London

The imposition of time constraints strengthens the relationship between working memory (WM) span tasks and mathematics. It is unclear why this occurs but the use of generic time-restrictions means that individual differences in processing speed cannot be eliminated as an explanation. Therefore, the current study used three (numerical, verbal, visuospatial) computer-paced WM tasks to titrate administration time based on individual differences in processing speed. Four WM performance indices (storage, processing time, processing accuracy, recall time) were compared to those under a condition with no time constraints. Children in Year 3 were assessed on WM in relation to current and prospective mathematics ability. Storage scores and processing times differently predicted current and longitudinal mathematics performance dependent on administration condition and task.

**A-0124 Boosting maintenance in working memory with temporal regularities**

Lison Fanuel[1,2,3],Yohana Lévêque[2,3], Gaëlle Piquandet[1,2,3], Barbara Tillmann[2,3], Gaën Plancher[1]

[1] Cognitive Mechanisms Research Laboratory, Lyon 2 University, F-69676, Bron, France [2] CNRS, UMR5292; INSERM, U1028; Lyon Neuroscience Research Center, Auditory Cognition and Psychoacoustics team, Lyon, France [3] University Lyon 1, Lyon, France

Music cognition research has provided evidence for the benefit of temporally regular structures guiding attention over time. Our study investigated whether maintenance in working memory can benefit from an isochronous rhythm. Participants were asked to remember six letters for immediate serial recall. Experiment 1 contrasted the presence of a regular rhythm to no sound during the retention interval. Results revealed improved memory performance with the rhythm, suggesting that temporal regularities can enhance maintenance in working memory. Experiment 2 confirmed this interpretation by contrasting the presence of a non-isochronous rhythm to no sound during the retention interval, but without showing improved memory performance. The findings are discussed in relation to current working memory models and the theoretical framework of dynamic attending.

**A-0132 Cross-Modal Working Memory Binding and L1-L2 Word Learning**

Shinmin Wang[1], Richard J. Allen[2], Ping Li[3]

[1] National Taiwan Normal University, Taipei, Taiwan [2] University of Leeds, Leeds, UK [3] Pennsylvania State University, University Park, USA

The current study examined the relationship between cross-modal working memory binding and lexical development in the learning of associations between unfamiliar spoken words and their semantic referents, and whether it would vary across experimental conditions in first and second language word learning. A group of English monolinguals were recruited to learn 24 spoken disyllable Mandarin Chinese words in association with either real or novel objects as semantic referents. They also took a working memory task in which their ability to bind auditory-verbal and visual information was measured. Our results suggest that cross-modal working memory binding is closely related to L1-like word learning, but might play a different role in a second language-like situation in the domain of spoken language.

**A-0157 Staying focused in visual working memory**

Richard Allen [1], Amy Atkinson [1], Taiji Ueno [2], Alan Baddeley [3], Graham Hitch [3]

[1] University of Leeds, UK, [2] Nagoya University, Japan, [3] University of York, UK

We examined how to-be-ignored distractor stimuli simultaneously presented alongside target items impact on visual working memory, and the role executive attention resources may have in mediating these impacts. Across three experiments, distractors had a consistent negative effect on immediate memory for colours, shapes, and colour-shape combinations. This distractor effect increased in size when participants performed a more demanding verbal task during encoding and retention, suggesting an important contribution from domain-general executive control in limiting interference from unwanted perceptual input. This interactive relationship was independent of the number of distractors present, though target accuracy did decline with 4 or 8 distractors, relative to 1. These findings add to the ongoing debate concerning links between working memory and attentional control.

**A-0309 Evidence for an independent olfactory working memory that is not reliant on verbal or visual recoding.**

Andrew Moss, Andrew Johnson, Jane Elsley, Christopher Miles
Bournemouth University
Dependent on availability, olfactory memory may utilise both verbal and perceptual codes (Zelano, Khan, Sobel, & Montag, 2009). N-back tasks (modelled upon Jönsson, Møller, & Olsson, 2011) with odours that elicit high or low verbal association were used to examine the impact of verbalisation in olfactory working memory (OWM). Stimuli were presented sequentially, and required a binary forced-choice memory judgment as to whether the current odour matched the stimulus two items previous. Inter-stimulus interval (ISI) tasks were manipulated between groups (silence, concurrent articulation, or mental rotation). An observed n-back advantage for verbalisable odours did not interact with ISI tasks. Implications for olfactory representations that do not utilise a verbal code, and possible importance of familiarity in OWM, are discussed.

**A-0406 Working Memory Updating and the Removal of Outdated Information**

Ullrich Ecker [1], Klaus Oberauer [2], Stephan Lewandowsky [3,1], Kris Singh [1], Gilles Gignac [1]
[1] University of Western Australia; [2] University of Zurich; [3] University of Bristol
The ability to keep working memory content up to date is important for a number of higher cognitive functions such as reasoning, but it is also crucial for the effective operation of working memory itself. We argue that an active item-wise removal process lies at the heart of working memory updating. Removing outdated or irrelevant information allows focused processing of relevant information, and minimizes interference. We recently introduced a new memory updating paradigm to measure a person's removal efficiency. In this talk, I will discuss experimental evidence for removal, and present data from individual differences studies exploring the co-variation of removal efficiency with working memory capacity and fluid intelligence through structural equation modelling.

# Eyewitness Identification: Confidence, Accuracy, and Justifications

**S0007 session**

Monday, 18 July 2016 | 13:00 - 15:00 | Room 6

**Chair/Organizer: Chad Dodson**

**A-0091 Eyewitnesses: Not So Unreliable After All**

Laura Mickes [1], Steven E. Clark [2], Scott D. Gronlund [3], Henry L. Roediger III [4], John H. Wixted [5]

[1] Royal Holloway, University of London; [2] University of California, Riverside; [3] University of Oklahoma; [4] Washington University; [5] University of California, San Diego

The U.S. legal system increasingly accepts that there is a weak relationship between the confidence and accuracy of eyewitness identifications (IDs), a conclusion largely based on eyewitness ID research showing that the magnitude of the point-biserial correlation is typically low. Calibration analysis, a more appropriate approach, generally shows a strong relationship. However, even calibration analysis can underestimate the strength of the relationship. A review of the confidence-accuracy and confidence-based receiver-operating characteristic literatures shows when suspect ID accuracy (which excludes filler IDs) is plotted the relationship is even more impressive than is currently understood to be. These lab-based studies show that confidence and accuracy are strongly related, and high-confidence IDs are remarkably accurate. Moreover, these findings extend to real eyewitnesses.

**A-0092 UK Lineups Should be Simultaneously Presented**

Stacy A. Wetmore [1], Heather D. Flowe [2], John T. Wixted [3]; Laura Mickes [1]

[1] Royal Holloway, University of London; [2] University of Loughborough; [3] University of California, San Diego

Lineups in the UK are 9-member videos sequentially presented that are lapped through twice. An accumulating body of evidence shows that the simultaneous photo lineup yields superior discriminability (i.e., better ability to distinguish innocent from guilty suspects) relative to the sequential photo lineup. Moreover, the diagnostic-feature-detection (DFD) hypothesis predicts, and accounts for, this finding (Wixted & Mickes, 2014). In two experiments, we found that (1) compared to the standard UK procedure, discriminability was better using a hybrid procedure in which videos of lineup members were presented sequentially and all members were shown simultaneously, and (2) the hybrid procedure yielded lower discriminability than the standard 6-member simultaneous photo lineup. Furthermore, all identifications made with high confidence were highly accurate.

**A-0093 An ROC analysis of neutral and biased lineup instructions in the discrimination of suspects**

Yonatan Goshen-Gottstein, Liat Groner

Tel Aviv University

In two experiments, we applied ROC analysis to examine the probative value of lineup instructions (neutral, positive bias, negative bias) in discriminating between the presence and absence of a suspect. Participants viewed a video of a theft and were subsequently presented with a six-person lineup. In both experiments, participants were randomly allocated to one of three lineup-instruction conditions. Performance in the neutral condition was compared to that of a bias regarding the possibility that the suspect did, or did not, appear in the lineup. Unexpectedly, the instructions conditions had an effect on discriminability. We suggest that the different instructions may have directed participants to be more or less vigilant in performing lineup judgments, yielding different levels of discriminability.

**A-0094 Estimating discriminability in lineup tasks**

Ruth Horry

Swansea University

Signal detection theory (SDT) has proven to be a powerful theoretical framework for understanding decision making. A major strength of SDT is in separating discriminability (the ability of a decision-maker to discriminate signals from noise) from response bias (a decision-maker's willingness to respond that a signal is present). Recently, several SDT-based approaches have been applied to lineup data, in which participants attempt to identify a previously studied target from a series of faces that may or may not include that target. In a series of experiments, I directly compare these different approaches under conditions that should produce different levels of response bias, but leave discriminability unaffected. I also use simulated data to shed light on which measures should be preferred.

**A-0095 Enhancing identification performance in lineups for distinctive suspects**

Melissa F. Colloff, Kimberley A. Wade

University of Warwick

When constructing lineups for suspects with distinctive features (piercings, scars, etc), police must ensure that the suspect does not stand out. Previous research found that three fair lineup techniques for accommodating distinctive suspects equally enhanced eyewitnesses' ability to discriminate between innocent and guilty suspects compared to unfair lineups in which the suspect was the only person with the distinctive feature. But which techniques are beneficial for older witnesses or witnesses who did not see the feature during the crime? In two experiments (n = 2670, 1463) we found that all three fair lineup techniques were equally effective at enhancing performance in both older adults and those who did not encode the suspect's distinctive feature. Our results support the diagnostic-feature-detection model.

**A-0097 Judging Guilt and Accuracy: Confident Eyewitnesses are Discounted When They Provide Featural Justifications**

Chad S. Dodson

University of Virginia

Jurors are heavily swayed by confident eyewitnesses. Are they also influenced by how eyewitnesses justify their level of confidence? I document a counter-intuitive effect: When eyewitnesses identified a suspect from a lineup with absolute certainty ("I am completely confident") and justified their confidence by referring to a visible feature of the accused ("I remember his nose"), participants judged the suspect as less likely to be guilty than when eyewitnesses identified a suspect with absolute certainty but offered an unobservable justification ("I would never forget him") or no justification at all. Moreover, people perceive an eyewitness's identification as 25% less accurate when the eyewitness has provided a featural justification than an unobservable justification or simply no justification.

## Why do songs get stuck in our mind? Findings from research on involuntary musical imagery

**S0041 session**
Monday, 18 July 2016 | 13:00 - 15:00 | Room 7
**Chair/Organizer: Lia Kvavilashvili**
**Discussant: Lauren Stewart**

**A-0340 Involuntary Musical Memories: What can we learn about spontaneous cognition from them?**
Georgia Floridou [1], Vicky Williamson [2], Lauren Stewart [1], Daniel Müllensiefen [1]
[1] Goldsmiths, University of London, UK; [2] University of Sheffield, UK
Involuntary memories (IM), either episodic or semantic, comprise a large amount of our daily cognition. One very common type of IM is Involuntary Musical Memory and its most prevalent form is Involuntary Musical Imagery (INMI), which refers to musical excerpts coming to the mind unintended and subsequently repeating. Why is INMI important to study, what is interesting about it and what can we learn from it? In this talk, results from 4 different studies exploring INMI and its relationship to other forms of spontaneous cognition, using various methodologies, will be presented. Findings will be discussed in relation to theoretical frameworks of both spontaneous and musical cognition. Methodological issues, future avenues and possible applications will also be considered.

**A-0342 The precision and consistency of involuntary musical memories**
Kelly Jakubowski [1], Nicolas Farrugia [2], Andrea Halpern [3], Lauren Stewart [1]
[1] Goldsmiths, University of London, UK; [2] Institut Mines-Telecom, CNRS Lab-STICC, France; [3] Bucknell University, US;
The phenomenon of involuntary musical imagery (INMI) offers unique insights into the precision and consistency of recall of involuntary memories. Unlike most involuntary memories related to autobiographical episodes, INMI offers the opportunity for comparison of an involuntary memory to a “ground truth”, i.e., the original, recorded version of a tune. In the present research a novel method was implemented for measuring the musical tempo of INMI episodes, by asking participants to tap to the beat with a wrist-worn accelerometer each time they experienced an INMI episode during a four-day period. Results indicate a high degree of temporal precision in involuntary recall of tunes, with some inter-individual variations in regard to temporal consistency across multiple episodes of the same tune.

**A-0343 The role of cues and prior exposure in the occurrence of musical mind-pops**
Lia Kvavilashvili, Susan Anthony
University of Hertfordshire, Hatfield, UK
While research on involuntary repetitive musical imagery (“earworms”) has been growing steadily, one-off (transient) musical mind-pops have received little attention. They are part of a broader phenomenon of involuntary semantic memories, which are fragments of semantic knowledge (words, images, etc.) that come to mind unexpectedly, often without any obvious triggers. We report three diary studies, which examined the prevalence of self-reported cues and prior exposure as potential antecedents to the experience of musical mind-pops. In Study 1, all types of semantic mind-pops were recorded, while in Study 2 and 3, only musical mind-pops were recorded. Results show that studying musical mind-pops can provide useful information on the mechanisms underlying both non-musical mind-pops (words, images) and repetitive earworms.

**A-0344 Involuntary recall of instrumental film music - does emotion matter?**
Ella Moeck [1], Melanie K. T. Takarangi [1], Ira E. Hyman Jr. [2]
[1] Flinders University, Adelaide, Australia; [2] Western Washington University, US
Systematic research on intrusive music (earworms) has focused exclusively on music with lyrics (e.g., Hyman et al., 2013). But anecdotal and questionnaire evidence suggest that earworms may also develop for music without lyrics. In the current study, we aimed to establish whether people— under controlled laboratory conditions—experience earworms for instrumental music and examine whether emotional valence (positive, negative) affects the frequency of these earworm experiences. We exposed participants to several segments of positive or negative instrumental film music and measured the frequency, duration and characteristics of subsequent earworms. Our results suggest that verbal/auditory components, as well as emotional valence, are important in producing and maintaining earworms. Our data have interesting implications for studying and treating auditory involuntary memories.

**A-0345 Neural correlates of involuntary musical imagery using structural and resting-state MRI**
Nicolas Farrugia [1], Jonathan Smallwood [2], Rhodri Cusack [3], Lauren Stewart [4]
[1] Institut Mines-Telecom, CNRS Lab-STICC, France; [2] University of York, UK; [3] Brain and Mind Institute, London Ontario, Canada; [4] Goldsmiths, University of London, UK
Involuntary musical imagery (INMI) is the intrusion of a short loop of music into the imagination without conscious control. Recent behavioral research on INMI found similarities with other types of spontaneous memory, and with self-generated thoughts in general. The brain systems involved in the experience have not been determined. In two MRI studies using a trait measure of the INMI experience (the Involuntary Musical Imagery Scale), we found an association between frequency of INMI and the structure and connectivity of superior temporal, medial and inferior frontal, and cingulate cortices. In addition, affective aspects (such as the disturbance of INMI) were associated with the structure of the temporal pole, and with the connectivity between parahippocampal and inferior temporal cortex.

**A-1064 Musical hallucinations and imagery after playing video games: Insights from research on Game Transfer Phenomena**
Angelica Ortiz de Gortari
Nottingham Trent University, UK; University of Hertfordshire, UK
Music is embedded into videogames to enhance the experience. In studies with over 3,500 participants, gamers reported hearing music, noises and voices in their heads, coming from game-related stimuli or when engaging in game-related activities. This talk has two objectives: First, to compare the phenomenology and mechanisms of INMI and music hallucinations from videogames, and second, to discuss the implications of listening to music in comparison to interacting with sounds. Since videogame music is associated with visual cues, in-game actions and events, reviving it after playing can lead to: i) multisensory and cross-sensory experiences, ii) behavioural responses, and iii) misattribution errors. The importance of distinguishing endogenous from exogenous auditory phenomena will be also discussed.

## Collective memory/social I

**I051 session**
Monday, 18 July 2016 | 13:00 - 15:00 | Room 8
**Chair/Organizer: Robert A. Nash**

**A-0031 It must be my favorite brand: Using retroactive brand replacements in doctored photographs to influence brand preferences**
Maria V. Hellenthal, Mark L. Howe, Lauren M. Knott
City University London, UK
We examined whether memories for self-chosen brands could be altered by retroactive exposure to less liked competitor brands embedded in manipulated photographs and whether memory errors would lead to preference changes for falsely remembered brands. Fifty participants were asked to compile their personal 'brand lifestyle basket' which was then captured in a photo showing the basket and participant. Subsequent exposure to misleading brands in a doctored version of the original photograph yielded a robust misinformation effect. In addition, results indicated a positive shift in attitude and behavior towards falsely accepted misinformation brands. Our findings contribute to what we know about the consequences of false memories and extend the generalizability of false memory effects to a futuristic advertising measure.

**A-0074 Public attitudes on the ethics of planting false memories to motivate healthy behavior**
Robert A. Nash [1], Shari R. Berkowitz [2], Simon Roche [3]
[1] Aston University, Birmingham, UK; [2] California State University Dominguez Hills, Los Angeles, USA; [3] University of Surrey, Guildford, UK
Planting false memories could, in theory, lead to positive behavioral consequences, yet the idea of doing so outside the laboratory raises important ethical questions. How might the general public appraise this moral dilemma? Participants from the USA and UK read about a fictional "false-memory therapy" that led people to eat and behave more healthily, then they reported their attitudes on the acceptability of this therapy via scale-rating (Study 1) and open-text (Study 2) responses. There were surprisingly divergent responses to this contentious issue, and participants believed that various factors would influence their viewpoints. Whether or not deliberately planting memories outside the lab could ever be justifiable, these studies shed light on people's beliefs about and valuing of autobiographical memory.

**A-0150 Narrative Memory and Architectural Design. Memory projection processes**
Jorge Antonio Villanueva Uribe
Universidad Nacional Autónoma de México, Ciudad de México, México
It has been recognized that society's perception of the world can be molded and manipulated. Phenomena such as globalization, the creation of a consumer society and the mediatization of social institutions focus this perception on a feeling of isolation. Observing the effects of this perception operating in the field of architecture helps us to identify that in the majority of memorial spaces or spaces for memory suffer from a lack of traces of collective memory. This investigation analyses the intentions of projects in the processes of architectural design in the case of memorial spaces with the objective of defining and differentiating the way in which the narrative property of memory is integrated or not integrated into the aforementioned processes.

**A-0152 "A Colonial Vacation": Mémoires du Congo at the Royal Museum for Central Africa**
Jenny Folsom
University of Massachusetts, Amherst, USA
This article addresses memories of Belgians in the Congo (1885-1960) through the lens of "Mémoires du Congo," (MdC) a memorial group of former Belgian colonists. The MdC is heavily involved in a memory project with the Royal Museum for Central Africa (RMCA) where their stories are documented and used in museum displays. Currently, the RMCA is undergoing a dramatic renovation to separate its displays from the colonial spirit that embodies the museum. This article uses ethnographic research at the RMCA and MdC meetings to identify the conflicts present in reimagining Belgian colonial history today. The author finds that the RMCA often uses the presence of MdC members to avoid interrogating its collective colonial past.

**A-0379 Gender oriented research in Slovak villages based on oral history interviews**
Petra Chovancová
Faculty of Arts, Comenius University in Bratislava, Slovakia
In this abstract I would like to present my research project concerning rural life style of selected women in three small mountainous villages in North Slovakia (region Liptov). The project consists of two parts: practical and analytical/theoretical. The practical part involves the oral history method used for collecting the interviews. The theoretical part is based on analysis and interpretation of the narratives from the gender point of view. Major objectives of the research were to document the customs, attitudes, views and way of life of the women in the chosen area. I was not concentrated only on the subject of the interviews (What is remembered.), but also on the way they spoke about their history (How it is remembered.).

**A-0410 The communicative function of episodic recollection**
Johannes Mahr, Gergely Csibra
Cognitive Development Center, Central European University, Budapest, Hungary
We provide a novel account of episodic memory function based on an empirically informed analysis of its generative role in belief formation. First, we explain the metarepresentational structure of episodic memory in terms of its role in communicative interaction. According to this view, autonoesis and source monitoring allow us to determine when and how to assert epistemic authority in testimony. This account can make sense of a range of empirical evidence not explained by competing functional accounts. Second, we argue that a metarepresentational format is required for the representation of past events because of their importance in establishing diachronic social commitments. The ambiguity and centrality of social commitments in human social life necessitate efficient means to negotiate them communicatively.

**A-0059 Information presentation format moderates the unconscious-thought effect: a conjoint recognition study**
Marlène Abadie [1], Laurent Waroquier [2], Patrice Terrier [3]
[1] Université de Fribourg, Fribourg, Switzerland; [2] Université Blaise Pascal Clermont-Ferrand, Clermont-Ferrand, France; [3] Université de Toulouse Jean Jaurès, Toulouse, France
Previous research showed that the unconscious-thought effect, which refers to an improvement of decision-making following a distraction period,

was moderated by the presentation format of decision information. The aim of the current study was to replicate this finding and further examine the memory representations underlying decision-making after a distraction or a deliberation period. Results showed that a distraction period results in better decisions and increases gist memory when the information is presented blocked per choice option. By contrast, a deliberation period improved decision quality and increases verbatim memory when the information was presented per attribute. Finally,mediation analyses indicated that deliberation efficiency depends on verbatim memory whereas decision quality after distraction depends on gist memory.

# Neural Mechanisms of Memory Control

**S0011 session**
Monday, 18 July 2016 | 15:30 - 17:30 | Room 1
**Chair/Organizer: Michael C. Anderson, Taylor Schmitz**
**Discussant: Daniel Schacter**

**A-0098 Symposium Overview: Towards a Neurobiological Model of Memory Control**
Michael C. Anderson
MRC Cognition and Brain Sciences Unit, University of Cambridge, Cambridge, United Kingdom
Intrusive memories and thoughts are debilitating symptoms in many psychiatric disorders including PTSD, depression, anxiety, and schizophrenia. In this overview, I argue that understanding the origins of these clinical symptoms and why they persist fundamentally involves developing a neurobiological model of how people stop thoughts by controlling memory. The capacity to stop unwanted thoughts about past experiences, future fears, or unwanted images, is likely to be supported by multiple mechanisms including retrieval suppression, shifts in mental context, and self-distraction. I will illustrate how the symposium speakers are deepening our understanding of the neural basis of these mechanisms, including the development of retrieval suppression as a model system of stopping thought, paralleling model systems for how actions are stopped.

**A-0099 Primate prefrontal pathways affect the input and output of the hippocampus and memory.**
Helen Barbas
Boston University, Boston, United States
How does the prefrontal cortex influence memory-related medial temporal cortices? Pathways from anterior cingulate cortex (ACC), associated with contextual significance of events, innervate the entorhinal cortex, the gateway to hippocampus. These pathways innervate mostly excitatory neurons but also significant proportions of inhibitory neurons. Among the latter, in the upper layers of entorhinal cortex ACC innervates calretinin inhibitory neurons, which disinhibit nearby excitatory neurons, suggesting facilitated passage to hippocampus. In the deep rhinal layers, ACC preferentially innervates the powerful parvalbumin inhibitory neurons, which provide strong perisomatic inhibition of nearby excitatory neurons. These findings indicate that ACC has strong influence on inhibitory mechanisms to facilitate access of contextually significant stimuli into the hippocampus and gate access to and from the hippocampus.

**A-0100 Inhibitory control of thoughts and actions: Common control processes, dissociable targets**
Taylor Schmitz [1], Catarina Ferreira [2], Yuhua Guo [1], Michael C. Anderson [1]
[1] MRC Cognition and Brain Sciences Unit, University of Cambridge, Cambridge United Kingdom [2] University of Birmingham, Birmingham, United Kingdom
Do stopping unwanted actions and thoughts engage a common inhibitory-control mechanism? We present a within-subject fMRI study examining the functional and anatomical relationships between these abilities. We found that measures of motor stopping and retrieval suppression were tightly correlated, suggesting a common inhibitory function. Critically, motor and retrieval stopping evoked conjoint activations in right lateral prefrontal cortex. We corroborated this supramodal region in an independent meta-analytic conjunction analysis of motor stopping and retrieval suppression studies. Nevertheless, this shared control region selectively coupled with motor cortex or hippocampus depending on the process being stopped, and produced domain-specific down-regulation of activity in these regions. Inhibition of thoughts and actions thus relies on common control processes targeted in a domain-specific manner.

**A-0101 GABAergic inhibition of hippocampal retrieval processes supports the control of unwanted thoughts**
Michael C. Anderson [1], Taylor Schmitz [1], Marta Correia [1], Catarina Ferreira [2], Andrew Prescott [3]
[1] MRC Cognition and Brain Sciences Unit, Cambridge, United Kingdom; [2] University of Birmingham, Birmingham, United Kingdom; [3] University of Utah, School of Medicine, Utah, United States
Intrusive memories, images, and hallucinations are hallmark symptoms of psychiatric disorders. Although associated with deficient inhibitory control by the prefrontal cortex, difficulty controlling unwanted thoughts also is linked to hippocampal disinhibition arising from dysfunctional GABAergic interneurons. How hippocampal GABAergic processes could contribute to stopping unwanted thoughts remains unknown. Here we show that GABAergic inhibition of hippocampal retrieval activity forms a critical link in a fronto-hippocampal inhibitory control pathway retrieval suppression. H1 magnetic-resonance spectroscopy revealed that greater resting concentrations of hippocampal GABA predicted superior mnemonic control. Critically, higher hippocampal, but not prefrontal GABA predicted stronger negative coupling between the dorsolateral prefrontal cortex and the hippocampus during suppression, suggesting that GABAergic inhibition local to the hippocampus implements prefrontal control over unwanted memories.

**A-0102 Parallel regulation of memory and emotion supports the suppression of intrusive memories**
Pierre Gagnepain [1], Justin C. Hulbert [2], Michael Anderson [3]
[1] INSERM, U1077, Caen, France; [2] Bard College, Annandale-On-Hudson, United States; [3] MRC Cognition and Brain Sciences Unit, Cambridge, United Kingdom
Intrusive images are distressing mental pictures interrupting ongoing mentation and precipitating psychopathological symptoms. Intrusion suppression is mediated by a right fronto-parietal influence on hippocampal activity that interrupts episodic retrieval. Here we report that this process also triggers in parallel inhibition of affective content. We found that successful suppression of intrusive images reduces subsequent negative affect. Regulation of memory awareness and emotion shared a common fronto-parietal inhibitory network triggering parallel down-regulation of activity in the anterior hippocampus and amygdala. These findings support the idea that the brain regulates conscious awareness of a memory by selectively inhibiting reentrant activity including emotional content.

**A-0103 Neural evidence for the context account of directed forgetting**
Lili Sahakyan
University of Illinois, Urbana-Champain
Is it possible to intentionally forget something we no longer wish to remember? Plenty of behavioral evidence from directed forgetting research suggests that people can control their own forgetting and engage in processes that reduce the accessibility of unwanted information (for a review, see Sahakyan, Delaney, Foster, & Abushanab, 2013). We report an fMRI study using list-method directed forgetting paradigm, whereby we

manipulated the mental representations of contextual information associated with to-be-forgotten information, and used pattern classifiers to track neural patterns that reflected contextual information associated with the first list. The results provide first neural evidence for the context-change account of directed forgetting, and have implications for the role of control in motivated forgetting.

**A-0104 Functional connectivity changes with directed forgetting**

Barbara Knowlton
University of California, Los Angeles, Los Angeles, United States

Motivated forgetting is important for subsequent learning. When subjects are instructed to forget a list of words, subjects show better recall of a subsequent list. We found that following a "Forget" instruction, better recall of a subsequently learned list was associated with reduced connectivity between the right dorsal anterior cingulate and the left insula and supramarginal gyrus. In contrast, after receiving a cue to remember the previous list, better memory for the subsequent list was associated with greater connectivity between cerebellum and dorsal and ventral cingulate, and a decoupling of hippocampus from medial prefrontal and angular gyrus. These results provide insights into network dynamics underlying motivated forgetting and adaptive learning of new information.

**A-0105 PTSD symptom severity correlates with behavioral and neural markers of memory suppression**

Gerd Waldhauser [1], Martin Dahl [2], Martina Ruf-Leuschner, [2]Veronika Müller, [2] Maggie Schauer [2], Nikolai Axmacher [1], Thomas Elbert [2], Simon Hanslmayr [3]
[1] Ruhr-University Bochum Institute of Cognitive Neuroscience, Department of Neuropsychology, Bochum, Germany; [2] Department of Psychology, University of Konstanz, Konstanz, Germany; [3] Department of Psychology, University of Birmingham, Birmingham, Germany

The ability to suppress unwanted memories protects against being reminded of unpleasant and even traumatic experiences. We show that heavily traumatized refugees with posttraumatic stress disorder (PTSD) are unable to suppress even neutral memory representations in a think/no-think task. In contrast, refugees with a similar history of trauma and personal distress but no PTSD show intact memory suppression. Magnetoenecephalography indicates that memory suppression relies on the dynamic interaction between prefrontal executive control and medial temporal memory networks. Neural markers of successful memory suppression, such as reduced parietal event-related fields, correlate with fewer intrusions of traumatic experiences in every day life.

**A-0106 Attenuating future fears by suppressing recurrent prospective simulations**

Roland G. Benoit [1,2], Daniel Davies [3], Michael C. Anderson [4]
[1] Harvard University, Cambridge, United States; [2] Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany [3] University of Cambridge, Department of Psychiatry, Cambridge, United Kingdom [4] MRC Cognition and Brain Sciences Unit, University of Cambridge, Cambridge, United Kingdom

Recurring imaginings of feared episodes may contribute to the maintenance of anxiety. In two studies, we show that people can attenuate apprehensiveness about feared future events by suppressing episodic prospection for the event. We asked participants to list future aversive events that they had recurrently feared might happen (e.g., a parent’s death; a disease diagnosis). They then repeatedly imagined some events, or suppressed imagination of others. Suppression of the future was associated with an inhibitory signal originating from the right dorsolateral prefrontal cortex (PFC) that modulated hippocampal and ventromedial PFC activity. This mechanism diminished access to typical details and hindered subsequent imaginings. Critically, suppression reduced participants’ apprehensiveness about these future events, and the efficacy of this process predicted trait anxiety.

# Working memory across the lifespan: theoretical and applied perspectives

**S0053 session**

Monday, 18 July 2016 | 15:30 - 17:30 | Room 2

**Chair/Organizer: Amanda Waterman**

**A-0797 Not all of working memory declines in healthy ageing: evidence for self-organising multiple components**

Robert Logie

University of Edinburgh, UK

A widespread assumption is that the cognitive ability known as working memory declines across adulthood. The assumption is well supported by evidence from both cross-sectional and longitudinal studies of healthy human ageing. However, the extent and rate of cognitive decline in early and middle adulthood is poorly understood. Evidence will be described demonstrating that different aspects of working memory decline at different rates across the adult lifespan with some remaining largely intact in healthy old age, including dual task performance, visual feature binding and verbal short-term memory. These findings are argued to be consistent with a multiple component model of working memory that is limited, not by general attention, but by the accumulated capacities of each component.

**A-0798 Do actions speak louder than words? Following instructions in working memory**

Amanda Waterman, Amy Atkinson, Sadia Aslam, Richard Allen

University of Leeds, UK

The ability to encode, retain, and implement instructed action sequences within working memory is central to the successful completion of many behaviours. In a series of studies we explored how action – planned, enacted, and observed – impacted children's (aged 6-10 years; N = 258) and adults' (N = 28) ability to follow instructions. For both adults and children, enactment at recall improved performance. In contrast, enactment at encoding produced mixed results. For adults, there were beneficial impacts on performance. In children this interacted with level of difficulty of the task, with enactment at encoding having a deleterious effect on recall with more complex tasks. Application of these results to applied contexts will be discussed.

**A-0802 Visual working memory and attentional control in children and adults**

Richard Allen [1], Edward Berry [1], Amanda Waterman [1], Graham Hitch [2], Alan Baddeley [2]

[1] University of Leeds, UK; [2] University of York, UK

Recent research suggests that different forms of attentional control contribute to visual working memory for short sequences of objects. We explored this in a developmental context, presenting children (aged 7-10 years) with 3-item sequences of coloured shapes followed by cued recall tests of memory for these bindings. We examined whether children from different age groups demonstrate a potentially automatic recency advantage, and are able to strategically prioritise earlier items in the sequence. The relationship between performance on this primary task and a battery of working memory tasks was also explored. Outcomes are contrasted with those from young adults, and are discussed in relation to working memory development, and to the ongoing debate concerning interactions between working memory and attention.

**A-0806 Understanding working memory deficits in children with reading difficulties: Implications for remediation**

Joni Holmes, Sue Gathercole, Erica Bottacin, Sally Butterfield, Briony Westgate, Darren Dunning

MRC Cognition & Brain Sciences Unit, Cambridge, UK

The aim of this study was to evaluate the extent to which poor readers benefit from working memory training. Samples of children with low and age-typical reading abilities were recruited. The poor readers had deficits in both verbal working memory and phonological processing. Following training, they made equivalent gains on visuo-spatial working memory tasks to the comparison group, but reduced for verbal STM and verbal working memory tasks. One explanation is that verbal memory problems in children with reading difficulties may be a secondary consequence of difficulties in phonological processing and that memory training may not be sufficient to compensate for these problems. Alternative approaches targeting their core processing problems may, however, be effective in reducing working memory difficulties.

**A-0810 Verbal working memory contributions to Greek children's reading abilities**

Elvira Masoura, Andreanna Christodoulou, Ioanna Papiggioti, Grigoris Kioseoglou

Aristotle University of Thessaloniki, Greece

The present study investigates the contributions of working memory and intelligence to reading abilities of Greek speaking children aged 6-7 years. Children's intelligence and working memory capacity were assessed with verbal and non-verbal tasks. Children were also assessed for their reading fluency, writing accuracy, and reading comprehension. Verbal intelligence and verbal working memory significantly predicted all three reading measures in the multiple regression analyses. Also, hierarchical regression analyses revealed both common and independent contributions of intelligence and working memory, with vocabulary knowledge and simple storage capacity being the best predictors to all reading measures. Present findings are discussed in relation to participants' age and the characteristics of the Greek language, indicating the need for further cross-linguistic investigations.

**A-0811 Meta-Analysis of Working Memory Impairments in Survivors of Moderate-to-Severe Traumatic Brain Injury**

Darren Dunning [1], Briony Westgate [2], Anna Adlam [3]

[1] MRC Cognition & Brain Sciences Unit, Cambridge, UK; [2] University of East Anglia, UK; [3] University of Exeter, UK

Working memory (WM) deficits are commonly reported following moderate-to-severe traumatic brain injury (TBI) but the nature of impairments is not clearly understood due to the complex interacting cognitive and neural systems contributing to WM performance. Objectives: To establish the magnitude of deficits in WM following TBI relative to healthy controls, and explore the moderating effects of time since injury and age at injury on impairments. Results: Individuals with TBI had significant deficits in WM relative to controls. Greater decrements in verbal WM were associated with older injuries signifying verbal skills do not 'recover' over time. Larger deficits in verbal WM were evident for TBIs that occurred later in life suggesting that TBI exacerbates age-related decline in verbal WM in adults.

**A-0813 Altering developing neurophysiology with working memory training**

Duncan Astle [1], Jessica Barnes [1], Kia Nobre [2], Kate Baker [3], Mark Woolrich [2]

[1] MRC Cognition & Brain Sciences Unit, Cambridge, UK; [2] University of Oxford, UK; [3] University of Cambridge, UK

Poor working memory skills are predictive of educational underachievement and developmental disorder. Despite great interest in working memory training, especially in childhood, little is known about the neurophysiological mechanisms by which gains are achieved. I will present data from a double-blind randomised controlled working memory training study, in which we use MEG to explore underlying neurophysiological changes following training. Improvements in working memory after training were associated with changes in functional connectivity, consistent with a framework in which slower cortical rhythms enable the dynamic regulation of higher frequency activity related to task-related cognitive processes. This is the first demonstration that hierarchically organised neuronal coupling can be measured in childhood, is associated with working memory, and can be augmented by training.

# Temporally Extended Autobiographical Memory: Lifetime Periods, Event Clusters, and Life Chapters

**S0052 session**
Monday, 18 July 2016 | 15:30 - 17:30 | Room 3
**Chair/Organizer: Dorthe Kirkegaard Thomsen**
**Discussant: Tilmann Habermas**

**A-0799 Lifetime Periods: A Transition-Theory Perspective**
Norman Brown
University of Alberta
Transition Theory (T2) assumes that the content and organization of autobiographical memory (AM) mirror the structure of experience and reflect the operation of basic associative processes. Thus, this approach rests on an environmental analysis that emphasizes repetition, co-occurrence, change, and distinctiveness. I identify several basic AM constructs – event components, event representations, lifetime periods, transitions – and define them within the T2 framework. I then argue that: (a) period formation is driven by association and by repeated exposure to frequently encountered, co-occurring event components; (b) period boundaries are transitions that bring about large-scale synchronized changes to the set of regularly encountered event components; and (c) these claims hold for individual-level transitions (e.g., relocation) and collective ones (e.g., war).

**A-0801 The Content and Organization of Specific, Recurring, and Temporally Extended Autobiographical Event Narratives**
Theodore E. A. Waters [1], Robyn Fivush [2]
[1] New York University – Abu Dhabi [2] Emory University
Research shows that autobiographical memory contains a mixture of single, recurring, and extended event memories. However, the vast majority of research has focused on memories of single events (events occurring over

**A-0803 Respondent Retrieval Strategies Inform the Structure of Autobiographical Knowledge**
Robert F. Belli
University of Nebraska--Lincoln
The structure of autobiographical knowledge has been theorized to consist of periods of stability and transitions between these periods. Survey interviewing of respondents to collect retrospective reports on their life course provides an opportunity to examine how participants navigate through their autobiographical memory structures. Respondents use parallel, timing, duration, and sequential retrieval strategies, which are features that support the existence of an autobiographical knowledge base that is structured with periods and transitions. There are sequences of interviewer-respondent interactions that are most predictive of respondents using these retrieval strategies in their generation of responses. Results have implications regarding the associations that exist within the structure of autobiographical knowledge, and how such associations are implemented as retrieval strategies in reconstructing one's past.

**A-0805 On the Organization of Episodic Future Thoughts in Event Clusters**
Arnaud D'Argembeau
University of Liège
Memory can be flexibly used to imagine events that might happen in one's personal future, a capacity that has been referred to as episodic future thinking. In this talk, I will present data showing that many episodic future thoughts are not represented in isolation, but instead are part of higher-order event clusters that organize imagined events in coherent themes and causal sequences. Personal goals seem to play an important role in this organization and neuroimaging evidence shows that event clusters recruit brain regions supporting conceptual and integrative processing. These findings suggest that episodic future thinking involves the integration of specific event representations with autobiographical knowledge, which contextualizes imagined events with respect to personal goals and general expectations about one's life.

**A-0807 Past and Future Life Story Chapters in Relation to Subjective Well-Being**
Dorthe Kirkegaard Thomsen [1], David B. Pillemer [2]
[1] Aarhus University [2] University of New Hampshire
Life story chapters refer to representations of important autobiographical periods associated with information about the people, places, activities, and objects typical for the period (e.g., "my marriage"). Chapters are constructed for both past and future and are emotionally evaluated as positive and negative. Research suggests similarities between past and future event representations, and we examined whether past and future chapters were similarly related to subjective well-being. In three studies, we asked participants to describe past and future chapters in their life stories, rate these on emotional valence, and complete measures of well-being. We found that more positive past chapters were related to higher subjective well-being. A similar but somewhat less consistent pattern was found for future chapters.

**A-0809 Understanding Autobiographical Fluency Deficits in Depression: Specific versus Categoric Retrieval**
Barbara Dritschel [1], Saima Noreen [2]
[1] University of St. Andrews [2] Goldsmiths University
Depressed individuals have difficulty retrieving specific memories, often producing a categoric memory when a specific memory is requested. However, there has been no examination of how the fluency of retrieving specific versus categoric memories varies across lifetime periods for depressed versus non-depressed individuals. The current study examined this question in a sample of thirty depressed and 30 non-depressed university students. Participants were asked to retrieve as many specific and categoric memories as possible within 60 seconds for events that occurred in primary school, secondary school and the past six months respectively. Quantitative and qualitative differences were found between depressed and non-depressed groups for both specific and categoric fluency. The implications of reduced fluency for the different lifetime periods are discussed.

**A-0812 The Structure of Past and Future Lives in Depression and PTSD**
Tim Dalgleish [1], Caitlin Hitchcock [1], Georgina Smith [1], Aliza Werner-Seidler [2], Laura Jobson [3]
[1] Medical Research Council Cognition and Brain Sciences Unit [2] Black Dog Institute [3] Monash Institute of Cognitive and Clinical Neuroscience, Monash University
Emotional disorders such as depression and posttraumatic stress disorder (PTSD) are characterised by perturbances in the way the

autobiographical past is represented and processed. These biases have been shown to precipitate and maintain difficulties over time. Here we present a series of studies in which depressed, trauma-exposed and healthy participants are asked to identify the chapters both of their life history and their anticipated future life, and then assign personal descriptive information to the designated chapters. We present data showing that discrete patterns in the nature of the allocated information, the redundant patterns across chapters, and the clustering of information among chapters, shed light on the underlying representational structure of lifetime periods in these diverse clinical conditions.

# Memory, awareness and metacognition

**S0061 session**
Monday, 18 July 2016 | 15:30 - 17:30 | Room 4
**Chair/Organizer: Daniel C. Mograbi**
**Discussant: Robin G. Morris**

**A-1038 Postretrieval overconfidence and anosognosia in patients with Alzheimer's disease (AD)**
Sarah Genon [1,2], Marlène Mélon [3], Eric Salmon[4], Fabienne Collette [1]
[1] Faculty of Psychology and Educational Sciences, University of Liege [2] Jülich Research Centre (Germany) [3] Psychological Sciences Research Institute, University Catholic of Louvain [4] GIGA-CRC in vivo imaging, University of Liege
General self awareness (anosognosia) and metacognitive monitoring in memory tasks are both impaired in AD, but how they relate to each other is still an open question. We examined awareness with the Anosognosia Questionnaire Dementia (AQD) and monitoring within a memory task, during retrieval with feeling-of-knowing (FOK) and post-retrieval, with judgment-of-confidence (JOC). FOKs/JOCs were performed for names of people either previously linked to self or other. AD showed both impaired FOK and JOC. They also showed lower self metamemory effect in their JOCs and lower awareness of their behavioral functioning in the AQD, which was specifically related to overconfidence in their JOCs for self-related items. Thus, anosognosia and altered postretrieval monitoring for self-related information may be related in AD.

**A-1039 Metacognition and mood congruent recollection in Alzheimer's disease**
Daniel C. Mograbi [1,2], Elodie Bertrand [1], J. Landeira-Fernandez [1], Robin G. Morris [2]
[1] PUC-Rio; [2] IoPP&N, King's College London
Previous studies have shown that mood state influences estimations of performance and metacognitive accuracy. We investigated the impact of mood on awareness of symptoms in AD patients, focusing on the recollection of their memory impairments. Positive and negative mood was induced in 2 experiments, using reaction time (exp.1) and memory tasks (exp.2). In each experiment, a success-failure paradigm was used, and participants did an easy task and a very hard task, Before and after each task, participants were asked to answer questions regarding their condition. Failure after the memory task, but not after the reaction task, led to better awareness about condition in patients. This highlights that not only mood state, but also context, influence recollection of information about condition.

**A-1040 Judgment of retrieval failure in Alzheimer's disease**
Julie Bertrand [1,2], Chris Moulin [2], Olivier Rouaud [3], Sophie Guillemin [3], Celine Souchay [2], Yannick Béjot [1,3]
[1] Unité de recherche EA4184, Centre d'épidémiologie de populations et de santé publique de Bourgogne (CEP) [2] Laboratoire de Psychologie et NeuroCognition, LPNC UMR CNRS 5105, Université de Grenoble Alpes [3] Centre Mémoire Ressources et Recherche (CMRR), Hôpital François Mitterrand, Dijon
The present study is the first attempt to experimentally measure feelings of forgetting in semantic and episodic memory. Fifty young adults, 30 older adults and 13 Alzheimer's patients were recruited. For the semantic task, participants had to recall all regions of France and were then asked to estimate how many regions they had forgotten or recalled. For the episodic task, the same procedure was used with a list of 22 words to learn. Preliminary findings show that for young adults, predictions of forgetting are as accurate as retrieval predictions for the two memory tasks. Alzheimer's patients and older participants are more accurate for retrieval predictions than for forgetting predictions, only in episodic memory.

**A-1041 Cognitive stimulation for memory and executive functions in people with Mild Cognitive Impairment**
Valentina Moro
Università degli Studi di Verona
We present the results of two studies regarding Mild Cognitive Impairment, where metacognitive abilities were taught in order to improve memory (M) and executive functions (EF). Although the methodological structure was the same, the programs were individualized for each patient's specific problems. A program to ameliorate caregivers' assistance was associated. In both studies, two groups (A and B) were compared in a cross-over design. The results show that: i) performance was improved as an effect of training; ii) these improvements were specific to the functions stimulated, but iii) training for EF also had positive effects on M; iv) in the interval without intervention the B Groups's performance worsened; iv) globally the A Groups maintained their results over time.

**A-1042 Anosognosia for amnesia and misleading memory traces**
Gianna Cocchini, Silvia Chapman
Goldsmiths University of London
Contradictory findings have been reported on the relationship between lack of awareness (anosognosia) for amnesia and the impaired memory consolidation process. Objective: To investigate whether the presence of misleading memory traces, rather than mere failure of memory consolidation, may affect awareness for amnesia. Method: Evidence of anosognosia was assessed in a sample of 16 amnesic patients who also performed a Source of Memory (SoM) Test and the Continuous Response Task (CRT). Results and conclusions: The correlation between amnesia and awareness degree was poor (r=.378). Unaware (5) and aware (11) patients showed similar difficulty in the SoM task. However, anosognosics showed significantly more false alarms than aware patients in the CRT, suggesting a crucial role of temporal context monitoring in awareness.

**A-1044 Selfhood, memory and awareness in dementia**
Robin Morris [1], Daniel Mograbi [2,1]
[1] IoPP&N, King's College London [2] PUC-Rio
In this talk, the findings presented by the symposium speakers will be summarised, with links being drawn between memory function, metacognition and self awareness in dementia. Seven different aspects of selfhood and their interaction in people with dementia will be explored, namely critical, petrified, surrogate, embodied, extended and implicit, petrified and surrogate. These different aspects of the person are found to map on to taxonomies of neurocognitive functioning, in particular declarative versus procedural memory systems, and links between these self-processes and awareness of condition can be drawn.

# Face memory – Eyewitness I

**I131 session**
Monday, 18 July 2016 | 15:30 - 17:30 | Room 5
**Chair/Organizer: Catriona Morrison**

**A-0051 Inconsistencies Across Repeated Eyewitness Interviews: Subtle Pressure Can Make Witnesses Change Their Memory Reports**
Linda Henkel
Fairfield University, Fairfield, CT, United States
Past work shows that direct negative feedback and suggestive questioning can lead eyewitnesses to change their memory reports. The present two experiments examined how indirect feedback from an interviewer can makes witnesses change what they report remembering they witnessed, using Gudjonsson's (2003) model of interrogative suggestibility and applying it to interviews with witnesses. After watching a video of a crime, witnesses were interviewed twice, and those that had been given indirect supportive negative feedback changed significantly more of their responses than those given no feedback. Lower confidence ratings were associated with greater response change, but overall, despite having changed more responses, people given indirect negative feedback did not have reduced confidence or perceived accuracy.

**A-0231 Level of detail and beliefs about memory predict credibility judgments about delayed allegations of sexual assault.**
James Ost, Danielle Evans, Alexander Price
University of Portsmouth, Portsmouth, UK.
In two experiments participants read a transcript of a police interview with an alleged victim of sexual abuse, before rating their credibility and the reliability of their evidence. Employing a 2 x 2 design, the transcript concerned an event that occurred either (i) 2-3 or (ii) 30 years previously with interviewees providing either (i) detailed or (ii) vague descriptions. In the first experiment (N=80) the level of detail increased, and the delay to reporting decreased, credibility judgments. In the second experiment (N=100) we partially replicated these findings and found that participants with beliefs more in line with the scientific consensus gave lower credibility ratings to the victim, particularly in the condition involving a highly detailed, delayed allegation.

**A-0276 Combining elements of the sequential and simultaneous line-ups: the hybrid lineup.**
Timothy J Hollins [1], Nathan Weber [2]
[1] Plymouth University, Plymouth, UK; [2] Flinders University, Adelaide, Australia
An eyewitness identification requires either the selection of a single individual, or the rejection of all lineup members: prior research shows that witnesses tend to select too frequently if the lineup members are presented simultaneously but show poorer memory if they are presented sequentially. Here we compare a standard simultaneous lineup with a hybrid lineup in which witnesses see the same simultaneous lineup but believe more alternatives will be revealed if the initial set is rejected. While the two lineup decisions are objectively identical, the hybrid lineup lowers choosing rate without changing memory sensitivity, and so manages to combine desirable features of both simultaneous and sequential lineups. The role of report criterion in lineup decisions will be discussed.

**A-0487 Priming and ERP repetition effects suggest a Bruce & Young-like recognition model for brands**
Stephan G. Boehm, Catherine Atherton
Bangor University, Bangor, UK
Influential semantic memory models such as the person recognition model by Bruce and Young propose distinct knowledge stages, such as recognition units, identity nodes and semantic information units. Processing at these stages is reflected in particular forms of priming and distinct ERP repetition effects. Comparisons of different knowledge domains indicate strong similarities and telling differences of these stages. Here we addressed the relevance of recognition models for brands. We presented brand logos in a familiarity task twice with a short delay whilst measuring ERPs. Repeated logos showed data-driven priming and ERP repetition effects, similar to other knowledge domains. These findings suggest that brand recognition might depend on a recognition system similar to those for persons and other domains.

**A-0653 The role of prior knowledge in associative learning over multiple repetitions**
Oded Bein[1], Maayan Trzewik [2], Niv Reggev [3], Anat Maril [2,3]
[1]Psychology Department, New York University, New York, USA; [2]Psychology Department, The Hebrew University of Jerusalem, Jerusalem, Israel; [3] Cognitive Science Department, The Hebrew University of Jerusalem, Jerusalem, Israel
Prior knowledge enhances one-trial explicit memory. However, learning often occurs over multiple repetitions, presumably via different mechanisms. Here, participants learned repeating pairs including a Famous face and a Novel face (F-N), or two Novel faces (N-N). Behaviorally, the participants responded more quickly in the F-N condition compared to the N-N condition. Interestingly, this enhanced-learning only emerged over repetitions, and involved the facilitation of specific-pair association, beyond stimuli-response learning. Using fMRI and representational-similarity-analysis (RSA), we found differential neural evidence of learning in the presence – versus in the absence – of prior knowledge. We focused on learning over repetitions and combined implicit and explicit behavioral measures, as well as RSA, to investigate a central phenomenon: schema-enhanced-learning. Potential underlying mechanisms are discussed.

**A-0002 Can memory be distorted through lying**
Catriona Morrison [1], Rose Wastling [2]
[1] Heriot-Watt University, [2] University of Leeds
To what extent can lying about an event distort genuine accounts? One week after watching a staged event, participants had to lie about details central to an event they had witnessed. They were tested for their memory two weeks later and comparisons were made to individuals who had told the truth throughout. Liars had a significant reduction in accuracy on the final test compared to truth tellers, but only for questions in which they had previously lied. However, the majority of liars did not incorporate their past lies into memory accounts in the final test; instead they gave new, yet still incorrect, answers. Subjective confidence ratings showed there was no significant difference in perceived accuracy of liars and truth tellers.

# Recognition II

**I072 session**
Monday, 18 July 2016 | 15:30 - 17:30 | Room 6
**Chair/Organizer: Helen L. Williams**

**A-0301 Effects of confidence undermining for true and false memories**
Ainat Pansky, Liana Tkatch, Liad Ruimi
University of Haifa, Haifa, Israel
In two experiments, we examined the effects of initial confidence undermining on subsequent memory monitoring and performance, and to what extent these effects differ for true and false memories. In the recall test that followed the presentation of each DRM wordlist, we attempted to undermine confidence for one recalled item—either a (true) studied word or a (false) critical lure. When the subsequent recognition test was conducted immediately (Exp. 1), longer reaction times and lower confidence judgments were found for the undermined items, whether true or false. Interestingly, when the recognition test was delayed by one week (Exp. 2), the effect on confidence was reversed, such that it actually increased following initial undermining, but only for the studied items.

**A-0302 Know Versus Familiar in the Remember-Know paradigm**
Helen L. Williams [1], D. Stephen Lindsay [2]
[1] Keele University, UK [2] University of Victoria, Canada
In the Remember-Know paradigm, a Know response can be defined to participants as a high-confidence state of certainty or a low-confidence state based on a feeling of familiarity. To examine the effects of definition on use of responses, in two experiments, definitions of Remember and Guess were kept constant but definitions of Know and/or Familiar were systematically varied to emphasize (a) a subjective experience of high-confidence-without-recollection, (b) a feeling of familiarity, (c) both of these subjective experiences combined within one response option, or (d) both of these experiences as separate response options. The confidence expressed in Know and/or Familiar definitions was shown to influence how participants used response options; and this influence differed across deep and shallow encoding.

**A-0408 Correcting misinformation – An investigation into backfire effects**
Ullrich Ecker [1], Briony Swire [1], Stephan Lewandowsky [2,1]
[1] University of Western Australia; [2] University of Bristol
Correcting misconceptions is a non-trivial task. Alas, misinformation continues to influence memory and reasoning even after credible corrections. It has been claimed that sometimes corrections can even backfire and ironically strengthen the misconceptions they aim to refute. Three such backfire effects have been reported: (1) An overkill backfire effect (OBE), where using too many counterarguments can backfire; (2) a familiarity backfire effect (FBE), where retractions backfire if they make the myth more familiar through repetition; and (3) a worldview backfire effect (WBE), where corrections that violate a person's worldview can backfire. We tried to elicit these backfire effects in a series of experiments, finding no evidence for OBEs and FBEs, but support for the existence of WBEs under certain conditions.

**A-0528 Stimulus Position in Your Vision Biases Recognition Memory**
Kiyofumi Miyoshi, Hiroshi Ashida
Kyoto University, Kyoto, Japan
The effect of stimulus spatial position on memory judgment was assessed in a pseudo-learning recognition memory test. Participants underwent a pseudo-learning, and subsequently made intuitive recognition memory judgments for the stimuli presented in random position on an eye tracker monitor. Hierarchical logistic regression analysis revealed that the more left/upper the stimulus located, the greater familiarity arose. The present findings can be explained in the context of asymmetry of spatial attention and fluency expectation. Unconscious reference to the mental time line, and/or reciprocal interaction between eye movements and mental processes could be alternative explanations.

**A-0796 Manipulating Response Bias in Recognition Memory: The Case of Implied Base Rates**
Arndt Bröder, Simone Malejka
University of Mannheim
The manipulation of response biases in recognition-memory tests—such as varying the base rate of old items—is an important tool for comparing rival measurement models. However, small changes in the response behavior can heavily affect the estimated model parameters, when base rates are extreme. Therefore, some authors use a procedure with constant base rates of 50% old items, but variable proportions of "old" responses required via instruction. We demonstrate that this procedure leads to an inner conflict: Participants who recognize a moderate number of old items are nudged to respond "new" to items recognized as old. Our claim is supported by interview data and decreases in d' when using implied rather than actual base rates.

**A-0765 Developing novel techniques for investigating recognition memory confidence.**
J. A. Urquhart, A.R. O'Connor
[1] University of St Andrews, UK
Experimental paradigms assessing human recognition memory have traditionally recorded confidence strength using discrete numerical ratings. However, recent research indicates that this discrete measurement fails to capture confidence ratings to the precision with which they could be rendered. In one experiment testing old/new word recognition, the pressure exerted on response grips was employed as a proxy for response confidence. Results showed the relationship between pressure and accuracy was analogous to that between discrete confidence ratings and accuracy— elevated pressure corresponds to increased accuracy likelihood. Results are modelled using a newly-developed procedure for constructing continuous receiver operator characteristics. This modelling technique has been applied to additional novel techniques for the assessment of continuous recognition confidence, which will also be discussed.

**A-0572 A linear likelihood approximation that captures the regularities of recognition memory.**
Andrew Heathcote, Adam Osth, Simon Dennis
[1] University of Tasmania, Australia; [2] University of Newcastle, Australia
We develop a linear approximation to the likelihood-ratio (LR) transformation for the Gaussian signal detection model of recognition memory. We

prove this approximation captures three regularities of recognition memory: The mirror effect, where any manipulation that increases performance exhibits opposite effects on hit rates (increasing) and false alarm rates (decreasing); The zROC length effect, where any manipulation that increases performance produces a zROC line that is shorter in length than the condition that produces worse performance; and The Variance Effect, where as performance increases, the variances of the LR distributions increase for targets and lures as they move further from the point where the log(LR) is zero. Applications to modelling recognition-memory response times are discussed.

**A-0954 Attention, cognitive control, and recognition memory: Three perceptual desirable difficulties?**

Tamara Rosner [1,2], Maria D'Angelo [3], Ellen MacLellan [1], Hanae Davis [1], Bruce Milliken [1]
[1] McMaster University; [2] University of Waterloo; [3] Rotman Research Institute at Baycrest

The present research was inspired by work in the cognitive control domain, in particular by the idea that attentional conflict can induce cognitive control adaptations that are item-specific (Botvinick, Braver, Barch, Carter & Cohen, 2001; Verguts & Notebaert, 2008). We wondered whether this item-specific adaptation would impact episodic learning as measured in a recognition memory task. It did (Rosner, D'Angelo, MacLellan & Milliken, 2015; see also Krebs, Boehler, DeBelder & Egner, 2015). Here we report follow-up studies that identify two potentially related effects. Together, the three effects are not well explained by adaptations in cognitive control triggered specifically by conflict, but may be related more broadly to adaptations that occur in response to processing difficulty.

# Emotion and memory II

**I141 session**
Monday, 18 July 2016 | 15:30 - 17:30 | Room 7
**Chair/Organizer: Adam R. Congleton**

**A-0212 Investigating the Influence of Emotion on Event Memory Using a Virtual Event Paradigm**
Adam R. Congleton, Dorthe Berntsen
Center on Autobiographical Memory Research (CON AMORE), Aarhus University, Denmark
Memories of past events can be influenced by a variety of factors, including the emotional valence associated with the event and the manner in which that emotion was elicited. Developing techniques that effectively capture emotion's influence is essential for understanding how event memories are shaped. The present study involved the investigation of emotion using a new experimental paradigm allowing for greater control over the encoding of event memories than previously possible, while maintaining many features of naturalistic events; namely, the Virtual Event paradigm. Across three experiments, we investigated how emotional valence and elicitation influenced the recall and accuracy of event memories utilizing this paradigm. The results revealed the important role of emotional elicitation in mitigating previously documented effects of valence.

**A-0280 Wolf in sheep's clothing or wolf in wolf's clothing? Effects of emotional congruency and basic emotions on associative memory in communicative context – fMRI study.**
Monika Riegel[1], Marek Wypych[1], Małgorzata Wierzba[1], Michał Szczepanik[1], Katarzyna Jednoróg[2], Patrik Vuilleumier[3,4], Artur Marchewka[1]
[1]Laboratory of Brain Imaging, Neurobiology Centre, Nencki Institute of Experimental Biology of Polish Academy of Sciences, 3 Pasteur Str, 02-093 Warsaw, Poland [2]Laboratory of Psychophysiology, Department of Neurophysiology, Nencki Institute of Experimental Biology of Polish Academy of Sciences, 3 Pasteur Str, 02-093 Warsaw, Poland [3]Swiss Centre for Affective Sciences, University of Geneva, CH-1211 Geneva, Switzerland [4] Laboratory for Neurology and Imaging of Cognition, Department of Neurosciences and Clinic of Neurology, University Medical Centre, CH-1211 Geneva, Switzerland
We investigated how emotion influences associative memory of words within communicative context in fMRI study using emotional words and faces.During encoding sessions, words were shown paired with faces, forming emotionally congruent/incongruent conditions.During retrieval sessions, old/new words were shown and participants indicated if they had seen them in the context of face expressing disgust, fear, other or new. Analysis of correct responses showed that congruent disgust was retrieved better than other emotional pairs.At the neuronal level, we found a significant effects of correct retrieval of emotional material in hippocampi driven by the difference between BOLD contrast estimate values for emotionally incongruent and neutral stimuli.

**A-0281 On the influence of disgust and fear on long-term memory – fMRI study using Nencki Affective Word List (NAWL).**
Monika Riegel[1], Małgorzata Wierzba[1], Marek Wypych[1], Katarzyna Jednoróg[2], Anna Grabowska[2], Artur Marchewka[1]
[1] Laboratory of Brain Imaging, Neurobiology Centre, Nencki Institute of Experimental Biology of Polish Academy of Sciences, 3 Pasteur Str, 02-093 Warsaw, Poland [2] Laboratory of Psychophysiology, Department of Neurophysiology, Nencki Institute of Experimental Biology of Polish Academy of Sciences, 3 Pasteur Str, 02-093 Warsaw, Poland
50 subjects (25F; aged 20-35) took part in fMRI study, with stimuli selected from NAWL.During encoding session, they memorized pairs of words (disgusting/fearful/neutral), imagining them as single mental representations and asked to rate how successful they were.After 16-18 days, the subjects were invited for recognition session, and asked to determine whether a word was old or new and if they were sure or unsure of their response. Behavioral analyses showed a higher rate of correct recognition of old pairs than false recognition.Disgusting and fearful stimuli were better remembered than neutral stimuli.At the neuronal level, analyses of the retrieval session showed increased activation for correctly recognized old vs.new pairs in ACC and PCC, bilateral IFG and thalami.

**A-0368 The boundary restriction effect: disentangling arousal and valence.**
Deanne Green, Melanie Takarangi, Jessica Wilcock
Flinders University
Boundary extension—the tendency to misremember scenes as having extended peripheral detail—is a robust error. Recent research shows that negative content triggers the opposite phenomenon: boundary restriction (BR). However, it is unclear whether BR occurs because the image valence is negative, or because the image causes a state of hyper-arousal. In the current research, we investigated whether BR occurs when subjects are exposed to highly arousing stimuli in the absence of negative valence. Our data show that BR increases—and boundary extension decreases—when a neutral image is accompanied by a highly arousing stimulus, compared to a no-arousal condition. Therefore, it may be the state of arousal rather than the valence of an image that leads to BR.

**A-0401 Memory amplification for traumatic experiences: Can improving source-monitoring ability eliminate source-monitoring errors due to post-event information?**
Sasha Nahleen [1], Melanie Takarangi [1], Deryn Strange [2], Reg Nixon [1]
[1] Flinders University, Australia; [2] John Jay College of Criminal Justice, CUNY, USA.
Victims of trauma often come to remember the traumatic event as more traumatic later, compared to immediately after the event. Drawing on decades of memory distortion research, researchers have proposed this "memory amplification" occurs because of a source-monitoring error; people incorporate additional post-event information (PEI) into their event memory. With a trauma analogue design, we examined whether PEI does increase traumatic memory distortion and the degree to which it can be manipulated. After viewing traumatic photographs, we tested participants' memory before and 24-hours later, after exposure to PEI. As predicted, PEI did distort traumatic memory. However, improving participants' source-monitoring ability eliminated source-monitoring errors after a short delay (24 hours; Study 2) but not a longer delay (1 week; Study 3).

**A-0565 Vivid İmagery Prevents Closure: Distinct Roles of Emotionality and Reliving**
Sezin Öner [1], Sami Gülgöz [1]
[1] Koç University, Istanbul, Turkey
Visual imagery is an influential factor on quality of autobiographical remembering. Retrieval enriched with vivid imagery enhances retrieval of details, which results in intense reliving. In recalling vivid event scenes of negative memories, this mechanism prevents reduction of event salience over time. In the current study, we tested a causal model to examine the role of reliving and emotionality on the relationship between imagery and

variables of closure (psychological distance and memory pop-ups). Participants (N = 205) reported memories of a conflict with substantial impact and rated memory characteristics as well as psychological distance. Results showed that reliving mediated the influence of imagery on psychological distance and that emotional intensity mediated the relationship between visual imagery and involuntary remembering.

**A-0581 The Nature and Prevalence of Involuntary Cognitions about Traumatic Experiences**

Jacinta Oulton, Melanie Takarangi
Flinders University, Adelaide, Australia

People regularly experience involuntary cognitions—memories or thoughts that occur spontaneously in consciousness—in everyday life. Recent evidence indicates that some of these cognitions are non-memories, including daydreams. However, the frequency of non-memories concerning trauma is unknown. We investigated the prevalence of trauma-related involuntary cognitions in a US adult sample (N=610). Almost half (43%) of trauma-exposed participants (N=466) reported experiencing involuntary cognitions about their most traumatic event, in the past month. Cognitions were predominantly visual and classified as autobiographical memories. However, 18% were non-memories, which tended to be events or outcomes that participants had not experienced, including nightmares and future events. Our findings may help explain why victims of trauma often remember their experiences as more traumatic over time.

# Novel Approaches to Investigating the Neural Computations Underlying Memory-Guided Decision Making

**S0006 session**
Monday, 18 July 2016 | 15:30 - 17:30 | Room 8
**Chair/Organizer: Raphael Kaplan**
**Discussant: Christian Doeller**

**A-0040 The Hippocampus as a Cognitive Map for Model-Based Planning**
Oliver Vikbladh [1], Neil Burgess [2], Orrin Devinsky [3], Nathaniel Daw [4]
[1] Center for Neural Science, New York University [2] UCL Institute of Cognitive Neuroscience, University College London [3] Department of Neurology, New York University [4] Princeton Neuroscience Institute, Princeton University
The hippocampus supports memory and navigation in spatial tasks but there little direct evidence that the same structure is employed for abstract goal-directed planning. We tested 19 epilepsy patients with unilaterally resected temporal lobes and 19 controls on a virtual-reality task evaluating hippocampus-dependent “place-memory”, and a sequential decision-making task, assessing goal-directed “model-based” planning. Patients displayed attenuated place-memory and bias away from model-based planning. Furthermore, place-memory predicted model-based planning, but only in the control group. Our results indicate a causal role of the hippocampus in model-based planning and that hippocampal representations may provide a common neural substrate for flexible navigation and sequential decision-making, but that following damage to this structure, differential compensatory mechanisms are employed.

**A-0041 A map of abstract relational knowledge in human entorhinal cortex**
Mona M Garvert[1], Raymond J Dolan[1,2], Timothy EJ Behrens[1,3]
[1]University College London [2] Max Planck-UCL Centre for Computational Psychiatry and Ageing Research [3] University of Oxford
The hippocampal-entorhinal system encodes a veridical map of space that is used in spatial navigation. It has been proposed that the same system might also represent a ‘cognitive map’ of the complex relationships between objects, events and other types of information. Here we demonstrate that complex map-like organisations can be reconstructed from entorhinal fMRI responses when relationships are non-spatial rather than spatial, discrete rather than continuous and unavailable to conscious awareness. This map-like representation might underpin the ability to make inferences that go beyond previous direct experiences. Furthermore, a direct relationship between a neural architecture involved in processing spatial and non-spatial information indicates that neural codes discovered in spatial tasks may translate directly to other forms of cognition.

**A-0043 Ventromedial prefrontal cortex lesions impair mnemonic valuation and memory selection**
Melissa Hebscher [1,2], Asaf Gilboa [1,2]
[1] Rotman Research Institute at Baycrest; [2] University of Toronto
Accurate memory retrieval depends on metacognitive monitoring and control. Individuals subjectively assess the correctness of retrieved information (monitoring), and subsequently decide whether to report it as a memory or withhold it (control). In decision-making, ventromedial prefrontal cortex (vmPFC) automatically encodes confidence estimates. These are second-order choice judgments based on first-order, subjective, experience-based valuations. We show that metacognitive memory processes parallel those in decision-making, suggesting convergence across domains. vmPFC damage diminishes the relationship between first- and second-order metacognitive memory processes. Damage to subcallosal vmPFC impairs first-order memory monitoring, and additional posterior orbitofrontal damage leads to deficient second-order control. These regions support valuation and choice in decision-making, respectively. Thus, similar structures that support memory-guided decision-making also mediate decisions about memory content itself.

**A-0045 Human prefrontal representations reflect established and simulated mental state spaces.**
Nicolas Schuck [1], Yael Niv [1], Robert Gaschler [2], Carlo Reverberi [3]
[1] Princeton University [2]Universität Hagen [3] Università Milano - Bicocca
Prefrontal representations of environmental states are commonly assumed to reflect a mental model of the world that guides learning, memory and decision-making. The nature of such state representations in the brain is not well studied, however. In particular little is know about how an established mental model is changed, a process that requires internal simulation and is important for the ability to make strategy improvements. We investigated such prefrontal state representations during stable task performance or sudden strategy changes. Results from fMRI pattern classification analyses showed that such representations can be decoded from orbitofrontal cortex and signals from medial PFC reflected internally simulated strategy changes. These findings shed light on the interplay between prefrontal state representations, decision-making and learning.

**A-0046 Relating rapid mental simulation to past experience**
Raphael Kaplan [1,2], John King [1], Raphael Koster [1], Mohit H Adhikari [2], Rikkert Hindriks [2], Yusuke Murayama [3], William J Penny [1], Dante Mantini [4,5], Neil Burgess [1], Nikos K Logothetis [3], Gustavo Deco [2], Karl J Friston [1]
[1] University College London; [2] Universitat Pompeu Fabra, Barcelona, Spain; [3] Max Planck Institute for Biological Cybernetics, Tubingen, Germany; [4] ETH Zurich; [5] KU Leuven
The neural computations that enable us to rapidly simulate the outcome of sequential choices with little or no learning, are unclear. Here, I present data highlighting how distributed neocortical regions potentially support prospective choice and how these regions might be influenced by spontaneous activity in neural circuits. Specifically, I focus on human fMRI results isolating rostro-dorsal mPFC and parietal midline regions that signal uncertainty about choices later in a sequence. I then will present findings showing that hippocampal sharp-wave ripples influence spontaneous fluctuations in similar regions. Taken together, these data provide preliminary evidence that replay of past events might allow the brain to explore past experience in order to prepare for novel decisions.

**A-0047 Mechanisms of memory storage and recall in humans**
Helen Barron[1,2], Tim Vogels[1], Uzay Emir[2], Timothy Behrens[2]
[1]Centre for Neural Circuits and Behaviour, University of Oxford, Oxford, UK;[2] The Oxford Centre for Functional Magnetic Resonance Imaging of the Brain, University of Oxford, Oxford, UK
Neural circuit level descriptions of cognitive processes are difficult to measure in humans, but can provide important insight into brain function. Here I will present a set of studies that illustrate how non-invasive measurements of the human brain can be used to index neural circuit mechanisms

responsible for memory and decision-making. In the first set of studies, I show that memories are stored in cortex in balanced excitatory-inhibitory ensembles, lying dormant unless cortical excitability is modulated. In the second set of studies, I show how these balanced memories may be released during memory recall. To achieve this I combine 7T fMRI and MRS with transcranial direct current stimulation in humans, and compare this data with electrophysiological recording in animal models.

# Keynote session III

**K3 session**

Monday, 18 July 2016 | 17:40 - 18:25 | Room 1

**Chair/Organizer: Fiona Gabbert**

**A-1010 The Curiously Complex Relation Between Confidence and Accuracy in Memory Research: A Possible Resolution**

Henry L. Roediger III
Washington University in St. Louis

Cognitive psychologists in laboratory situations often report high correlations between confidence and accuracy in reports from memory (for lists of words, pictures or similar materials). Forensic psychologists from a social psychological tradition often report a weak or even nonexistent relationship between confidence and accuracy in simulated crime studies. How can we reconcile these different relations? I will show that several different methods or approaches can be used to address the confidence-accuracy relation. In lab studies using word lists, the same set of data can provide positive, null and negative correlations (with the same subjects and items) depending on the method of analysis. But what about the confidence-accuracy relation in mock-crime lineup studies or even real lineups used in police departments? I will argue that when the most appropriate analysis is applied to the issue - a confidence-accuracy characteristic curve -- the relation between confidence and accuracy is surprisingly strong, at least on the first memory test a witness is given. The most confident witnesses average about 98% accuracy in an initial fair lineup. The claim that confidence is useless or of limited value is wrong for initial eyewitness identifications. Confidence can have strong evidentiary value in courts of law, so long as only the initial test is considered. All witnesses are confident by the time they get to court, and that fact has created the false impression that confidence is always unreliable.

## Keynote session IV

**K4 session**

Tuesday, 19 July 2016 | 08:30 - 09:20 | Room 1

**Chair/Organizer: Martin A. Conway**

## What is the Parietal Lobe Contribution to Episodic Memory?

**S0059 session**
Tuesday, 19 July 2016 | 09:30 - 11:30 | Room 1
**Chair/Organizer: Jon Simons**
**Discussant: Morris Moscovitch**

**A-0995 Parietal contributions to cued recall: Neuropsychological findings**
Daniel A. Levy
Interdisciplinary Center Herzliya, Israel
The functional significance of episodic retrieval-related activity in posterior parietal cortex has yet to be fully characterized. We investigated this issue in a lesion-effects study of cued recall following pair-associate learning. Middle cerebral artery stroke patients and controls were tested on cued recall tasks involving repeated study-test trials for pairs of words, pairs of object pictures, or pairs of object pictures and environmental sounds. Behavioral and lesion data were used to compute correlations between area lesion extent and memory deficits, and to conduct voxel-based lesion-symptom mapping. These analyses implicated lateral ventral parietal cortex, especially the angular gyrus, in cued recall deficits, most pronouncedly in the cross-modal picture-sound pairs task, indicating a substantive parietal involvement in recollective processes requiring multi-modal integration.

**A-0974 Parietal contributions to the subjective experience of remembering**
Jon S. Simons
University of Cambridge, UK
Remembering personally experienced events in vivid, multisensory detail involves reactivating cognitive and perceptual event features and integrating them into a conscious representation during retrieval. In this talk, I will consider evidence from patient lesion and brain stimulation studies, and from univariate and multivariate analyses of functional neuroimaging data, addressing the contribution of the lateral parietal lobe to the subjective experience of remembering. Our findings suggest that the angular gyrus region of the parietal lobe plays a key role during retrieval in integrating memory features from different modalities into an egocentric multisensory representation detailing how a past event played out. These processes enable the subjective first-person perspective re-experiencing of the event that is such a cardinal feature of episodic memory.

**A-0982 Distinguishing neural mechanisms underlying the precision, vividness, and accuracy of episodic memory**
Franziska R. Richter, Rose A. Cooper, Paul M. Bays, Jon S. Simons
University of Cambridge
Here we contrasted measures of retrieval precision, vividness, and accuracy, both behaviourally and neurally. Participants encoded objects that varied parametrically on three features: colour, orientation, and location. Subsequently, participants' object-feature memory was tested by having them recreate studied objects' appearance using a continuous dial, and subjectively rate the vividness of each memory. We assessed how 'precisely' accurate memories were retrieved by measuring the degree to which responses clustered around the correct feature-value. Accuracy, precision, and vividness were dissociable behaviourally and neurally: accurate retrieval was associated with activity in hippocampus, activity in angular gyrus scaled with retrieval precision, and activity in precuneus tracked vividness. Thus, dissociable aspects of the retrieval process were associated with distinct neural signatures.

**A-0993 Direct Recordings from the Human Parietal Cortex During Memory Retrieval, Rest, and Sleep**
Josef Parvizi
Neurology and Neurological Sciences, Stanford University School of Medicine
Extant evidence suggests that subregions of the medial and lateral parietal cortex form key nodes of a larger brain network supporting episodic memory retrieval. While this has been extensively studied with neuroimaging and scalp EEG modalities, the spatiotemporal dynamics of parietal activity during memory retrieval remain to be explored with methods that have a combination of higher temporal resolution and precise anatomical source localization. In this talk, I will present data from simultaneous intracranial recordings in the medial and lateral parietal regions in neurosurgical human subjects implanted with intracranial electrodes. I will present evidence for electrophysiological co-activation of discrete neuronal populations in the medial and lateral parietal regions during episodic retrieval and their functional relationship during experimental conditions, rest, and sleep. Our findings provide strong neurophysiological evidence for intrinsic and task-dependent functional connectivity between discrete neuronal populations in the human parietal lobe during episodic memory retrieval.

**A-1013 Recollection and the ventral parietal cortex: a representational account**
Michael Rugg
University of Texas at Dallas, Dallas, USA
There is little dispute that episodic recollection is associated with enhanced neural activity within the ventral parietal cortex (angular gyrus), but there is little consensus about the mnemonic role of this region . Drawing on findings from studies of episodic retrieval, and on theoretical proposals about the role of the angular gyrus in semantic and linguistic processing, I shall argue that the region, perhaps along with other members of a 'core recollection network', acts to cohere retrieved content into an integrated episodic representation. An important line of evidence in support of this proposal comes from recent findings that while recollection-related enhancement of activity in the angular gyrus is seemingly 'content-independent', retrieved content can nonetheless be decoded multi-voxel pattern analyses.

# Conceptions of Self and Others in Autobiographical Memory

**S0047 session**

Tuesday, 19 July 2016 | 09:30 - 11:30 | Room 2

**Chair/Organizer: David B. Pillemer, Dorthe K. Thomsen**

**A-1021 Vicarious Memories**

David B. Pillemer
University of New Hampshire, Durham, USA

Vicarious memories represent specific episodes that happened to other people. Although the remembered events were not experienced personally, vicarious memories manifest several core properties of memories that focus on the self. In a recent study, memories of personal events that participants had recounted to a parent or friend shared many phenomenological and functional qualities with vicarious memories of events that a parent or friend had recounted to them. Vicarious memories have adaptive value--they guide future behaviors and strengthen social bonds. Conceptions of autobiographical memory that focus exclusively on the self should be expanded to include vicarious memories.

**A-1022 Personal and Vicarious Memories in Cultural Contexts**

Qi Wang
Cornell University, Ithaca, USA

In this presentation, I discuss the parallel cultural influences on personal and vicarious memories. I examine different sets of cross-cultural data of people's memories of themselves and important others, analyzing the accessibility, content, and specificity of the memories. Collectively, the findings showed that Western individuals exhibited a greater access to both personal and vicarious memories than did Asians and Africans. Westerners also tended to recall more self-focused and more specific memories of both types than did Asians and Africans, who tended to recall more relational and general memories. I discuss the findings in light of the shared cognitive-cultural mechanism – in way of cultural self-construal – underlying personal and vicarious memories.

**A-1024 My Story and My Mother's Story: Relating Personal and Mothers' Life Stories to Well-Being**

Dorthe K. Thomsen [1], David B. Pillemer [2]
[1] University of Aarhus, Aarhus, Denmark [2] University of New Hampshire, Durham, USA

Vicarious life stories refer to life stories for other people--a temporally, causally, and thematically coherent account of the other person's life. We examined in two studies whether vicarious life stories for mothers were related to personal life stories and the relationship between both life stories and well-being. More positive personal life stories were related to more positive life stories for mothers. More positive personal life stories and more positive life stories for mothers were both related to higher well-being, although findings were more consistent for personal life stories. The findings suggest that a positive narrative style may extend to both own and close others' lives and that this may influence well-being.

**A-1025 Learning Life Lessons from Intergenerational Narratives**

Robyn Fivush, Natalie Merrill
Emory University, Atlanta, USA

Families share stories frequently in everyday interactions, for multiple reasons. One critical use of family stories may be to help children better understand and navigate difficult life experiences. In a series of studies, we examined narratives told by parents and their adolescent children (ages 13 to 22 years), about conflicts and transgressions experienced by the parent in childhood. These are particularly interesting narratives because they are about experiences that challenge a positive sense of self. Young people who develop an authorial voice, and integrate personal and moral evaluations into intergenerational stories of transgression, show higher levels of well-being, suggesting that using difficult life experiences of parents as life lessons has positive benefits.

**A-1026 Constructing Multiple Visual Perspectives in Memories for Events**

Peggy L. St. Jacques
University of Sussex, Sussex, UK

The dynamic nature of memories allows us to the view the past from our own eyes, as events are typically experienced, or from an observer perspective, as if we were looking at ourselves. The visual perspective that we adopt during retrieval affects our current and future behaviour, but the behavioral and brain mechanisms that support visual perspective processes in memories are not well specified. In this talk I will discuss research that examines how constructing multiple visual perspectives in memories for lab-based events and virtual reality environments affects the accuracy of later memories, and I will touch upon the neural mechanisms that enable us to construct these multiple visual perspectives in memories.

# Development of memory I

**I062 session**
Tuesday, 19 July 2016 | 09:30 - 11:30 | Room 3
**Chair/Organizer: Ryan J Fitzgerald**

**A-0476 Investigating impaired short-term memory performance in children with ADHD**
Tadamasa Narimoto
Tokyo University of Social Welfare, Tokyo, Japan
Short-term memory performance in children with attention deficit hyperactivity disorder (ADHD) is normally lower than in typically developing children (TDC). The present study investigated, using a spatial span task, whether this lower performance is caused by difficulty keeping attention during encoding spatial locations or consciously retaining the mental representation after encoding. Results indicate that span scores of children with ADHD and TDC were not significantly different regardless of slow or fast presentation of spatial locations. However, span scores of children with ADHD were significantly lower than TDC when delayed recall was required. This study showed that children with ADHD did not have difficulty keeping attention during encoding but did have difficulty using attention to prevent the memory trace from decaying.

**A-0504 It looks familiar but I don't recollect: Repetition affects recognition memory differently in children and adults**
Marina Wimmer, Laura Koenig, Timothy Hollins
University of Plymouth, UK
We present evidence showing that developmental research can contribute to the question of whether a single process or two processes underlie recognition memory. In two experiments, 5-, 7-, and 11-year-olds (N = 140) completed a modified process-dissociation paradigm (Jacoby, 1991). Repeated item presentation at encoding increased familiarity in young children whereas it enhanced both familiarity and recollection in older children. Converging evidence was found in experiment two where a response time limit at retrieval decreased recollection while leaving familiarity unaffected. Findings suggest distinct age-related changes for recollection and familiarity. The double-dissociations throughout childhood after repeating items at encoding and limiting response time at retrieval are consistent with a dual-process assumption. Thus, familiarity and recollection are independent processes already in childhood.

**A-0601 The wildcard increases children's correct and (sometimes) incorrect rejections of lineups**
Ryan J Fitzgerald, Devon Tomlinson, Eva Rubinova, James Ost
University of Portsmouth
Children are more likely than adults to falsely identify an innocent person from a target-absent lineup. Adding a "wildcard" (blank silhouette) reject option has been found to reduce children's false identifications with no apparent cost to correct identifications. We tested the wildcard technique with lineup members of low or high similarity to a target person. Children (N = 163) observed the target person and completed a lineup task after a one-week delay. Irrespective of lineup member similarity, the wildcard option increased correct rejections of target-absent lineups. However, if lineup similarity was high, the wildcard option also increased incorrect rejections of target-present lineups. The findings suggest that when faced with a difficult task, children opt for the path of least resistance.

**A-0961 Working memory training in school: Effect on working memory, vocabulary and arithmetic**
Barbara Studer-Luethi [1], Minna Toermaenen [2], Katja Margelisch [1], Antonia Hogrefe [1], Walter J. Perrig [1]
[1] Center for Cognition, Learning and Memory, University of Bern, Switzerland [2] University of Helsinki, Finnland
Academic abilities are largely explained by working memory (WM). By implementing WM training in school-settings, we aim to investigate effects on academic abilities. In our previous study, we found significant improvement of cognitive abilities following training, but only improvements by trend in academic performance. In the current study, hundred thirty pupils were assigned to either 20 sessions of adaptive WM training or to a nonadaptive visual-auditory training. Pupils in the WM training group improved their WM and vocabulary performance significantly more than pupils in the control group. Moreover, we found significant transfer on performance in arithmetic. These results confirm our previous findings of near and far transfer after WM training, but extend our findings by demonstrating gains also for arithmetic.

**A-0523 Post-navigation rest supports the consolidation and integration of spatial memories into accurate cognitive maps in young and older adults**
Michael Craig [1,2,3], Thomas Wolbers [4], Mathew A. Harris [3], Patrick Hauff [4], Sergio Della Sala [2,3], Michaela Dewar [1,3]
[1] Department of Psychology, School of Life Sciences, Heriot-Watt University, Edinburgh, UK; [2] Human Cognitive Neuroscience, Department of Psychology, The University of Edinburgh, Edinburgh, UK; [3] Centre for Cognitive Ageing and Cognitive Epidemiology, The University of Edinburgh, Edinburgh, UK; [4] German Center for Neurodegenerative Diseases (DZNE), Aging and Cognition Research Group, Magdeburg, Germany
Post-learning rest supports the consolidation of new verbal memories. I will discuss recent experiments that examined the effect of rest on the consolidation and wider integration of spatial memories. Young and older adults learned a route through a virtual environment, followed by a 10min delay comprising either wakeful rest or a perceptual task. They then completed a cognitive mapping task, requiring the pointing to landmarks from a range of locations. Cognitive map performance was lower in older than younger adults, but there was a comparable rest-related enhancement in both age groups. Our findings suggest that rest enhances the consolidation and wider integration of spatial memories into accurate cognitive maps, and that this effect does not change substantially with normal ageing.

# Memory Decline and Preservation

**S0003 session**

Tuesday, 19 July 2016 | 09:30 - 11:30 | Room 4

**Chair/Organizer: Davide Bruno**

**A-0055 The recency ratio as a predictor of amnestic Mild Cognitive Impairment**

Davide Bruno [1,2], Nunzio Pomara [3,4], Rebecca Koscik [5], Sterling Johnson [5]

[1] Liverpool Hope University, UK; [2] Liverpool John Moores University, UK; [3] Nathan Kline Institute, NY, USA; [4] New York University, NY, USA; [5] University of Wisconsin, Madison, WI, USA

In Alzheimer's disease (AD), poor immediate primacy recall is typically accompanied by exaggerated recency, which is then lost after a delay. Therefore, we have argued that the ratio between immediate and delayed recency (i.e., the recency ratio; Rr) may be a useful marker of dementia risk in cognitively intact participants. We tested whether chance of conversion to amnestic mild cognitive impairment (aMCI) was affected by Rr. Longitudinal analyses of data from the Wisconsin Registry of Alzheimer's Prevention were carried out (N=520, mean age = 53, SD = 6.5) on cognitively normal individuals followed for approximately nine years. Forty-seven participants converted to aMCI at follow up. A series of binomial mixed models regressions showed that Rr significantly strengthened the prediction model.

**A-0137 Assessing the evidence for the role of head injury in Dementia and CTE**

A. Rutherford

[1] School of Psychology, Keele University, Keele, UK

Head injury is presented as a risk factor for dementia and chronic traumatic encephalopathy (CTE), with an almost standard set of references cited in support. However, instead of a list of independent studies identifying links between head injury and dementia, the references usually cite meta-analyses, while the relationship between head injury and CTE is evidenced almost exclusively by single-case studies. Given such empirical research is affected by problematic issues such as sample self-selection and the use of intact groups, the presentation considers the empirical studies and their meta-analyses supporting the head injury – dementia link, and what valid conclusions may be drawn from the single-case studies supporting the head injury – CTE link.

**A-0149 The Role of Environmental Context in Dementia**

Gerasimos Markopoulos

Bath Spa University, Bath, UK

A role for contextual information is invariably assumed in theories of episodic memory function. Extensive research has been conducted on behavioural and neuroimaging measures focusing on participants' retrieval of contextual information and on associative memory. Much evidence suggests that memory for context and associative memory start to decline early in AD. Consequently, the assumption is made that AD patients could not benefit from the incidental reinstatement of contextual information. Here, the case is made that a more thorough differentiation needs to be made between memory for context and the influence of incidental context reinstatement. Such a distinction would suggest the possibility that AD patients could benefit from the reinstatement of contextual information is worth exploring further.

**A-0088 Distraction by unintentional recognition: neural mechanisms and age-related changes**

Zara Bergstrom, John Allen, Dinkar Sharma

University of Kent, UK

Intentional recognition memory can be biased by unintentional recognition of distracting stimuli in the same environment. It is unknown whether intentional and unintentional recognition depend on the same underlying neurocognitive mechanisms. We used EEG to investigate the neural basis of distractor-induced recognition biases. The results show that both intentional and unintentional recognition involved a rapid automatic memory process, but conscious recollection was only elicited during intentional recognition. Additional experiments investigated how these processes were affected by the salience of distractors as well as ageing. The findings suggest that unintentional and intentional recognition involve dissociable memory processes.

**A-0134 Investigating the impact of glucoregulation on episodic memory in older adults using ERPs**

Nicola Jones [1], Leigh Riby [2], Michael Smith [2]

[1] Liverpool Hope University, Liverpool, UK; [2] Northumbria University, Newcastle upon Tyne, UK

Previous research has demonstrated that reduced glucoregulatory efficiency has detrimental effects on episodic memory in older adults, which is of particular interest given the increasing prevalence of type 2 diabetes in our ageing population. The current studies sought to investigate the neurocognitive mechanisms underpinning memory impairments in those with relatively poor glucoregulation using event-related potentials (ERPs). Behavioural results indicated that healthy older adults with poorer glucoregulation experienced impairments in both verbal episodic memory and face recognition. Subsequent ERP studies revealed that deficits in verbal memory were due to impairments in memory encoding ability as opposed to retrieval; face recognition deficits were a result of diminished structural encoding and attention to faces.

**A-0159 The contribution of experience-based and theory-based information to feeling of knowing judgements in young and older adults**

Suzannah M Morson [1], Chris J A Moulin [2], Celine Souchay [2]

[1] University of Aberdeen, UK [2] Université Pierre Mendes-France, France

It is proposed that metacognitive judgements rely on two sources of information: theory and experience. The contributions of each type of knowledge have been examined in JOLs, but to date no attempt has been made to look at their varying roles in FOKs. Two experiments, one between subjects and one within subjects, observed the effects of delay placement on FOK magnitude and resolution. Changes in delay placement should impact reliance on theory- and experience-based knowledge for making FOK judgements. FOK magnitude was affected in both studies, with differences in FOK resolution only observed due to an interaction with age. The relative contributions of theory- and experience-based information for FOK judgements in the current paradigm will be discussed.

**A-0176 Accuracy and Confidence Calibration of Associative Memory in Aging**

Yee Lee Shing [1,2], Sandra Düzel [1], Simone Kühn [1,3], Ulman Lindenberger [1]

[1] Center for Lifespan Psychology, Max Planck Institute for Human Development, Berlin, Germany; [2] Division of Psychology, University of Stirling, UK; [3] Universitätsklinikum Eppendorf, Hamburg, Germany

Previous studies showed that older adults are less accurate than younger adults in associative memory. In particular, older adults have higher propensity to falsely endorse recombined lures. An aspect that has not been paid as much attention in the literature is that older adults also tend to commit such false alarm with higher confidence level than younger adults. In this talk, I will present data from the Berlin Aging Study II on a face-profession associative memory task, examining age-related differences in memory accuracy and confidence calibration simultaneously, and their corresponding relationships to structural morphometric measures of the brain.

# Sleep and memory

**I031 session**

Tuesday, 19 July 2016 | 09:30 - 11:30 | Room 5

**Chair/Organizer: Caroline Horton**

**A-0236 Sleep and Memory Consolidation In Toddlers with Down Syndrome**

Goffredina Spanò, Rebecca Gomez, Mary Alt, Bianca Demara, Malissa Tsang, Nikhita Sachdeva, Megan K. Steuter, Arielle Ruda, Jamie Edgin
University of Arizona

Down syndrome (DS) is characterized by sleep disturbance and memory impairment. In order to examine the specific mechanisms underlying the potential association between fragmented sleep and learning in this population, we assessed word-learning (i.e., the acquisition of arbitrary object and label mappings) in toddlers with and without DS across periods of sleep and wake. Sleep physiology was collected with polysomnography. Preliminary results (n = 12 DS, 19 controls) show that, while levels of baseline retention were equivalent at 5 minutes, children with DS showed poorer retention over sleep, but not after the wake period, compared to their controls. Defining the mechanisms between sleep disruption and impaired memory retention could guide novel treatment approaches for the cognitive deficits in this group.

**A-0247 The continuity of the autobiographical memory system across sleep and wake: The self in dreams**

Caroline Horton
Bishop Grosseteste University, Lincoln, UK

Current self-images, measured via “I am…” statements, emerge in dreams. The present study explored this further by identifying whether past or future-statements featured also. An online questionnaire adopted the Most Recent Dream method and asked participants to generate 10 “I am…”, 10 “I was…” and 10 “I would like to be…” statements, measuring current, past and future self-images. Analyses (N=86) reflected that past and future self-images featured in dreams comparably to current self-images. Participants’ own self-images were incorporated to a significantly greater extent than the self-images of controls, demonstrating that individuals dream of their own constructed autobiographies. Together this indicates that dream-wake continuity extends beyond mere experiences or memories, and includes cognitive conceptions of the self.

**A-0845 Does Sleep Facilitate Working Memory Training in Children and Adults?**

Katharina Zinke, Jan Born
University of Tübingen, Germany

Sleep has been shown to play an important role in forming and reorganizing long-term memories. We aimed at investigating if sleep is also relevant for working memory (WM) in children and adults. Children (10-12 years) and adults were trained on an n-back task with ascending difficulty for three sessions separated by approximately 12h. Between the training sessions, participants either spent a full night sleeping first and then a normal day awake or vice versa. Improvements in performance between sessions depended on the timing of sleep and wake intervals for lower difficulty levels in children and higher difficulty levels in adults. The findings suggest an influence of sleep on WM in interaction with performance levels before and during training.

**A-0859 Identification of memory reactivation during sleep using EEG classification**

Suliman Belal [1], James Cousins [2], Wael El-Deredy [1], Laura Parkes [1,3], Jules Schneider [1], Penelope Lewis [4]
[1] School of Psychological Sciences, University of Manchester, Manchester [2] Cognitive Neuroscience Laboratory, Duke-NUS Graduate Medical School, Singapore [3] Centre for Imaging Sciences, University of Manchester, Manchester [4] School of Psychology, Cardiff University, Tower Building, Cardiff

Memory reactivation during sleep is important for consolidation, but is difficult to measure with brain imaging. We applied machine learning to electroencephalography data in order to detect such replay. Participants performed a serial reaction time task, using audio-visual stimuli to cue each finger press. Audio cues were then re-presented during sleep to trigger memory replay. Electroencephalographic classifiers that had been trained during wakeful imagining of the task were used to determine which finger movement had been cued in sleep. Classification of cued-replay was above chance in Slow Wave Sleep, but not Stage2 sleep. Identification of neural replay using electroencephalographic classifiers will provide a useful tool for future investigations of offline reactivation and its role in memory consolidation.

**A-0908 Cued reactivation in slow-wave sleep induces connectivity changes related to memory stabilization.**

Ruud Berkers [1], Matthias Ekman [2], Eelco van Dongen [1], Atsuko Takashima [2], Ken A. Paller [3], Guillen Fernandez [1]
[1] Donders Institute for Brain, Cognition and Behaviour, Radboud University Medical Centre, Nijmegen, the Netherlands [2] Donders Institute for Brain, Cognition and Behaviour, Radboud University, Nijmegen, The Netherlands [3] Northwestern University, Evanston, Illinois, United States

Post-learning memory replay, especially during slow-wave sleep is thought to enhance memory consolidation. Here, participants studied object-location-sound associations, of which half of the studied sounds were presented during post-learning sleep to externally induce memory replay. Brain activity was measured during this period with fMRI. Connectivity parameters were calculated during cueing with object-related and unrelated control-sounds. Object-related sounds were associated with increased network participation of early visual cortex, which was positively correlated to the overnight performance gain. Moreover, early visual cortex displayed enhanced connectivity during targeted reactivation with the hippocampus, parahippocampal cortex, thalamus, anterior cingulate cortex and right parietal cortex. Together, these results are indicative of externally cued replay that is related to memory consolidation.

# Future thinking

**I171 session**
Tuesday, 19 July 2016 | 09:30 - 11:30 | Room 6
**Chair/Organizer: Stephen Dewhurst**

**A-0058 Future thinking and false memory**
Stephen Dewhurst, Rachel Anderson, Lydia Grace
University of Hull, Hull, UK
Rating words for their relevance to a future event leads to better retention than rating them for their relevance to a past event. The current studies investigated the effects of future planning on false memory. In study 1, participants rated words for relevance to familiar scenarios (e.g., holiday) that had either occurred in the past or were likely to occur in the future. Relative to the past condition, future rating led to higher levels of false recognition of related but unstudied items. No effects of temporal direction were observed in correct recognition. The same pattern was observed in study 2 using unfamiliar scenarios (e.g., bank robbery), indicating that the effect does not depend on the recasting of familiar scenarios.

**A-0107 "Fly me to the moon" – temporal distance and event novelty modulate semantic contributions to past and future thinking**
Muireann Irish [1,2], Nadene Dermody [1], John R. Hodges [1]
[1] Neuroscience Research Australia, Sydney, Australia; [2] School of Psychology, the University of New South Wales, Sydney, Australia
Episodic future thinking is compromised in semantic dementia (SD), despite relatively intact retrieval from the recent past. Here, we investigated the influence of temporal distance on past and future thinking across 4 conditions: Last year, 10 years ago, Next year, 10 years ahead. A novel condition was also included requiring participants to simulate spending a day on the moon. SD patients demonstrated marked remote memory deficits, in the context of preserved recent retrieval. Future simulation was impaired irrespective of temporal context, with striking deficits in the novel condition. Semantic contributions to episodic past and future thinking increase in response to temporal distance and event novelty. Our findings highlight the pivotal role of semantic memory for complex episodic processes.

**A-0602 Visual imagery in remembering the past and imagining the future**
Cagla Aydin, Elif Kilic, Ozde Ozkaya, Olesya Blazhenkova
Sabanci University
Although there is considerable evidence regarding the role of visual imagery on autobiographical memory, studies that investigate the differential contributions of components of the imagery ability, object imagery and spatial imagery, are rare. We conducted two studies to explore this relationship. Study 1 focused on the relation between the phenomenological properties of past and future memories -as rated by the participants- and object/spatial imagery preferences, as indexed by tests, such as VVIQ, mental rotation test, and OSIQ scales. Study 2 explored the relationship between memory specificity –as coded externally- and visual imagery. Results, so far, showed that object imagery is correlated with the specificity of future event accounts but not with that of past events.

**A-0867 Emotional future-oriented thoughts: Characteristics and perceived functions**
Catherine Barsics [1,2], Marie Rebetez [1,2], Martial Van der Linden [1,2,3], Arnaud D'Argembeau [1,3]
[1] Swiss Center for Affective Sciences, University of Geneva, Switzerland [2] Cognitive Psychopathology and Neuropsychology Unit, University of Geneva, Switzerland [3] Department of Psychology: Cognition and Behavior, University of Liège, Belgium
Many thoughts that people form about their future refer to emotionally significant events. Such emotional future-oriented thoughts (EmoFTs) were first investigated in natural settings, and second in a lab study, distinguishing between anticipatory and anticipated emotions (i.e., emotions experienced in the present versus emotions expected to occur in the future). The characteristics (e.g., representational format) of the EmoFTs were examined, as well as their perceived functions. EmoFTs are frequent, are perceived to fulfill important functions such as goal pursuit and emotion regulation, and their characteristics vary according to valence. When examined in daily life, the positivity bias in the frequency of EmoFTs is restricted to anticipated emotions. Overall, these findings shed further light on the properties of future-oriented thoughts.

**A-0936 Does Setting Realistic Goals for the Future Depend on Accurately Recalling the Past?**
Stephanie A. Berger
College of Mount Saint Vincent, Bronx, USA
Autobiographical memory directs goal-related behavior and grounds goals in reality. But what if autobiographical memory itself is not fully grounded in reality? This study examines whether the level of correspondence between memory and actual events predicts characteristics of related goals. Early in the semester, students set goals for current course grades and described plans to achieve those goals. Later, students recalled all prior college grades which were then verified against their transcripts. We hypothesize that students whose memories correspond more closely to their actual grades will set more realistic course grade goals (closer on average to their actual GPA) and achieve more of their course goals compared to students with lower correspondence between their memory and actual grades.

**A-0994 Imagination in relation to memory and beyond**
Anna Abraham
Leeds Beckett University, Leeds, UK
The limitless capacity for the human imagination to be engaged across a wide range of contexts is fundamental to our day-to-day experiences. This paper provides an integrated overview of this exceedingly broad and complex field of study by way of a theoretically and empirically informed novel framework. Processes of imagination are allocated to one of five categories depending on whether they primarily involve mental imagery, intentionality, novel combinatorial processing, exceptional phenomenology, or altered psychological states. This classification aids in systemizing this multifaceted field of study, which, although classically linked to episodic memory, necessarily needs to be considered in wider contexts if the aim is to further knowledge on the human imagination in terms of both psychological and brain function.

# The Concept of Episodic Memory: Challenges from Philosophy and Psychology

**S0017 session**
Tuesday, 19 July 2016 | 09:30 - 11:30 | Room 7
**Chair/Organizer: Sven Bernecker**

**A-0164 Beyond Episodic Memory - How Do Interactions Matter?**
John Sutton
Macquarie University, Australia
Episodic memory for specific past events is privileged conceptually and methodologically across distinct subfields of philosophy and psychology, from personal identity and moral agency to dementia, depression, and trauma. Likewise, current work on future thinking focusses on imagining specific events. Yet memory of recurrent, extended, and generic past events is common and significant; while phenomenological, cognitive, and neuropsychological evidence shows that episodic memory interacts systematically and pervasively with both semantic memory and (though less commonly noted) certain varieties of procedural memory. I assess three families of response to these widely-acknowledged interdependencies between different forms of memory. On a pragmatic approach, as gaps open between scientific taxonomy and the holism of everyday cognition we must constantly attend to relations between them.

**A-0165 Dissociating Memory Traces and Scenario Construction in Mental Time Travel**
Sen Cheng [1], Thomas Suddendorf [2], Markus Werning [1]
[1] University of Bochum, Germany; [2] University of Queensland, Australia
There has been a persistent debate about how to define episodic memory and whether it is a uniquely human capacity. On the one hand, many animal cognition studies employ content-based criteria and argue that nonhuman animals possess episodic memory. On the other hand, many human cognition studies emphasize the subjective experience during retrieval as an essential property of episodic memory. We propose that both perspectives may examine distinct but complementary aspects of episodic memory by drawing a conceptual distinction between episodic memory traces and mental time travel. Episodic memory traces are sequential mnemonic representations of particular, personally experienced episodes. Mental time travel draws on these traces, but requires other components to construct scenarios and embed them into larger narratives.

**A-0166 Finding Phenomenological Differences between Episodic Simulations**
Sarah Robins
University of Kansas, USA
Some philosophers, like De Brigard, claim that the phenomenological similarities across different forms of episodic simulation suggest that there is a single underlying episodic capacity. I argue that this claim neglects a crucial element of the phenomenology: what the person takes herself to be doing. In episodic simulations of the future or various hypotheticals/counterfactuals, the person tracks which details from the past are being preserved and which are being altered. In episodic remembering, however, the constructions occur outside of conscious awareness; the swapping and blending of event details goes unnoticed. Attention to these phenomenological differences should be used to guide a richer understanding of how the shared neural mechanisms are put to use in each form of episodic simulation.

**A-0167 Functionalism as the Happy Medium between Narrativity and the Causal Theory of Memory**
Jorge Fernandez
University of Adelaide, Australia
According to the narrative picture of memory, a subject remembers an event episodically when her current experience coheres with those mental states of the subject which concern that event. According to the causal theory of memory, a subject remembers an event episodically when her current experience originates in a past perceptual experience of the subject which concerns that event. The former proposal is too liberal and the latter too conservative. I suggest that remembering episodically is the higher-order state of having some experience that plays a certain causal role in the subject. Unlike the causal theory of memory, this proposal allows for the possibility of memory reconstruction and, unlike the narrative picture, it rules out episodes of confabulation as memories.

**A-0168 Memory and Imagination: The Nature and Role of a Self-Narrative**
Martin A. Conway
City University London, UK
How do we know the (imagined) future has not already happened? How do we know what we imagined could have happened in the past did not in fact happen? How do we know that the interaction we imagine now has not happened? I develop on Goldie's (2012) notion of a 'self-narrative', a sense of self that encompasses past, present, and future, a dynamic self-mental model that is constantly up-dated and in which memories and imaginings are represented in more or less distinctive ways. I consider how this may breakdown following brain damage and in psychological illness.

**A-0169 Against the Causal Theory**
Kourken Michaelian
University of Otago, New Zealand
The causal theory of memory appears to be in tension with empirical research on the constructive character of memory in general and on remembering as mental time travel in particular, but philosophers have been reluctant to abandon it, for doing so threatens to erase the distinction between remembering the past and imagining it. I argue that research on constructive memory and mental time travel suggests that the very same process is at work whether or not an apparent memory of an episode is causally connected to the subject's experience of it. There is no distinction between remembering the past and imagining it: an apparent memory qualifies as a genuine memory as long as it is accurate.

**A-0170 World-Involvingess and Singularity: a Critical Discussion of the Relational Account of Episodic Memory**
Denis Perrin
University of Grenoble, France
According to the relational account of episodic memory, the remembered past events and/or objects are proper parts of the content of remembering. One can be mistaken about the identity of the events and/or object one is mentally reliving. Such features define the so-called world-involvingness of episodic memory. I criticize this view. Drawing on the narrow-wide levels of content distinction, I claim that the tenets of relationism conflate distinct

notions of singularity: a causal notion, on the one hand, and a phenomenological notion, on the other. One should admit only a type-world-involvingness about episodic memory in place of the token-world-involvingness favored by relationalism. I offer a different account of the singularity of episodic memory.

**A-0171 The Pragmatic Dimension of Episodic Memory**

Sven Bernecker
University of California Irvine, USA

The severity of an accuracy-diminishing memory disorder can be assessed either by counting the absolute number of errors and confabulations in the reported information or by looking at the proportion of erroneous and confabulated statements that is indexed. I argue that the choice between these accuracy measures depends on the social context. In a forensic setting, for instance, it is the absolute number of errors and confabulations reported that is crucial. Moreover, in some contexts, a memory report qualifies as accurate only if it accords with the objective reality. Yet when the primary aim of memory is impression management, a memory report must merely accord with the subject's initial perception of reality.

# Factors that enhance and disrupt memory

**S0049 session**
Tuesday, 19 July 2016 | 09:30 - 11:30 | Room 8
**Chair/Organizer: Angela Gutchess, Nancy Dennis**
**Discussant: Suparna Rajaram**

**A-0987 Reward motivation facilitates memory via post-encoding mechanisms of consolidation**
Vishnu Murty
University of Pittsburgh, Pittsburgh, PA, USA
Individual's have the capacity to prioritize valuable information into long-term memory. This influence of reward on memory becomes more prominent when tested at a delay, suggesting a putative role for post-encoding consolidation. I will present two studies demonstrating that reward facilitates systems-level memory consolidation in reward-associated sensory cortex. First, I will show that post-encoding changes in network connectivity between VTA, hippocampus, and reward-associated sensory cortex predict reward-motivated memory. Next, I will show that the preferential consolidation of reward-related items generalizes to non-rewarded items represented in reward-associated sensory cortex, including neutral memoranda presented prior to reward learning. Together, these findings broaden models of motivated memory to include mechanisms of systems-level consolidation in sensory cortex.

**A-0841 The good, the bad, and the forgotten: How emotional valence influences what we remember and forget**
Elizabeth A. Kensinger
Department of Psychology, Boston College
The valence of an emotional event can affect which event details are remembered: Negative events are associated with more sensory detail than positive events. These behavioral effects appear to be underpinned by neural effects that begin at encoding, with negative valence increasing sensory activity during the initial processing of a stimulus. The effects continue to intensify over consolidation intervals, especially when those intervals contain rapid eye movement sleep. At retrieval, valence differences are present even before the full content of an event has been elaborated and even when conscious recollection of the studied event does not occur. Together, these findings provide evidence for robust effects of valence on memory and demonstrate the protracted time-course over which these effects develop.

**A-0814 The influence of gist processing to both true and false memories**
Nancy Dennis
The Pennsylvania State University University Park, PA
The fuzzy-trace theory posits that memory can be based on retrieval of either item-specific or gist traces. While both types of memory traces support true memories, dependence on gist in the absence of item-specific traces has the negative side effect of increasing false memories. I will explore research from our lab suggesting that activity in the lateral temporal gyri is critical for mediating both perceptual and semantic gist while activity in early visual processing regions is critical for mediating item-specific memories. Finally, I will present evidence suggesting that age-related increases in false memories arise from an over-reliance on gist-based processing in temporal cortex combined with deficits retrieving item-specific details and under-recruitment of monitoring and evaluation processing in prefrontal cortex.

**A-0943 Age-related hyper-binding: Both a help and a hindrance?**
Karen L. Campbell [1], Lynn Hasher [2,3]
[1] Department of Psychology, Harvard University, Cambridge, USA; [2] Department of Psychology, University of Toronto, Toronto, Canada; [3] Rotman Research Institute, Toronto, Canada
Successful encoding, at least within an experimental setting, often requires limiting one's attention to task-relevant information and ignoring concurrent distraction. If attention is erroneously directed towards that distraction, it may become inadvertently (and obligatorily) bound to target information and ultimately interfere with retrieval. Across a series of experiments, we show that this is indeed the case for older adults, who owing to their reduced attentional control, form associations between co-occurring targets and distracters, as well as across successive events in time. While this excessive, or hyper-, binding likely contributes to older adults' associative deficit by way of increased interference at retrieval, we have also shown that it can improve memory when previously "irrelevant" information later becomes relevant.

**A-0962 Influence of Culture on Memory**
Angela Gutchess
Brandeis University, Waltham, MA, USA
Culture can shape some aspects of memory, based on the strategies or qualities of information that are prioritized in a particular culture. In this talk, I will examine how culture influences the neural bases of memory for specific versus general memories for visually detailed pictures, compared to similar lures. I will also explore how aging affects the pattern of memory errors across cultures, using categorically-related word pairs. Taken together, these data indicate the ways in which encoding and retrieval processes may reflect culture-specific strategies that influence both memory for details as well as false memory. Furthermore, data indicate that culture-specific memory strategies may not offer protective benefits with age, as older adults from both cultures were vulnerable to memory errors.

**A-0960 The Influence of Social Factors on Memory**
Michelle Meade
Montana State University, Bozeman, MT USA
When remembering, individuals rely on their own internal representation of an event and they also may turn to social sources for additional information. Importantly, others' suggestions can both improve and impair individual memory function. In this talk, I will present research from the collaborative inhibition paradigm demonstrating that individuals who acknowledge and incorporate their partner's suggestions may benefit from collaboration. I will also present research from the social contagion paradigm demonstrating that collaboration can be disruptive to individual memory when individuals incorporate others' errors into their own memories. In particular, I will discuss age effects in social contagion and how the salience of partner age influences social contagion effects. Social factors influence individual memory.

# Poster session II

**P2 session**

Tuesday, 19 July 2016 | 11:30 - 13:00 | Aula

**A-0317 Upregulating NMDA-receptor activity during sleep enhances declarative learning**

Marjan Alizadeh Asfestani[1], Jan Schwidetzky[1], Surjo R. Soekadar[3], Jan Born[1,2], Gordon B. Feld[1]

[1] Institute of Medical Psychology and Behavioral Neurobiology, Tübingen, Germany; [2] Center for Integrative Neuroscience, Tübingen, Germany; [3] Department of Psychiatry and Psychotherapy, Tübingen, Germany

Sleep enhances subsequent learning, presumably by freeing capacity for encoding in the hippocampus. In this double-blind, placebo-controlled, balanced crossover study we applied the N-methyl-D-aspartate-receptor (NMDA) co-agonist D-cycloserine (DCS), which in a previous study successfully enhanced sleep-dependent memory consolidation. Thirty participants received the drug or placebo and then slept for 8 hours. The next evening, they learned 80 word-pairs in three consecutive blocks. As memory retention is improved during sleep under DCS, presumably by strengthening the information learned before sleep, we predicted that DCS would decrease learning after sleep due to reduced encoding capacity and enhanced interference. Unexpectedly, our results indicate a significant increase in declarative learning after sleep under DCS, which indicates that NMDA-receptor activation enhances learning capacity after sleep.

**A-0323 Ventromedial prefrontal cortex: adding value to autobiographical memories**

Wen-Jing Lin[1], Aidan J. Horner[1,2], Neil Burgess[1,2]

[1] UCL Institute of Cognitive Neuroscience, London, UK; [2] UCL Institute of Neurology, London, UK

The medial prefrontal cortex (mPFC) has been implicated in autobiographical memory recall but its function is not yet clear. Its function in decision making is believed to relate to value representation. We hypothesised that the mPFC represents the subjective value of elements during memory retrieval. Using fMRI, we found that the BOLD signal in ventromedial prefrontal cortex (vmPFC) was modulated by the affective values of items in participants' memories when they were recalling and evaluating these items. Meanwhile, the activity of the same region was modulated by the personal significance and emotional intensity of the memory during memory recall. These results support the idea that vmPFC is involved in representing the personal emotional values of the elements comprising autobiographical memories.

**A-0324 Distinct cognitive deficits in schizophrenia are associated with task-specific prefrontal cortex dysfunction**

Jane R. Garrison [1,2], Emilio Fernandez-Egea [2,3,4], Rashid Zaman [3,5], Mark Agius [3,5], Jon S. Simons [1,2]

[1] Department of Psychology, University of Cambridge, UK; [2] Behavioural and Clinical Neuroscience Institute, University of Cambridge, UK; [3] Department of Psychiatry, University of Cambridge School of Clinical Medicine, UK; [4] Cambridgeshire and Peterborough NHS Foundation Trust, UK; [5] South Essex Partnership University NHS Foundation Trust, UK.

Schizophrenia is a severe neuropsychiatric illness associated with impaired cognitive functioning, which may arise from generalised cortical inefficiency or instead reflect separable and domain specific impairments. This was addressed through direct comparison of behavioural results and neural activity associated with two cognitive tasks in 20 patients with schizophrenia and 20 controls. Participants performed reality monitoring and working memory tasks while undergoing scanning for fMRI analysis. Dissociable behavioural deficits were observed in patients in both tasks, which were associated with separable task and region specific dysfunction in the medial anterior PFC for reality monitoring and dorsolateral PFC for working memory. These results are consistent with models of multiple and distinct cognitive deficits in schizophrenia related to underlying functional and structural dysconnectivity.

**A-0336 Patterns of brain activity associated with mind-wandering among young and older adults: An EEG study.**

Léa Marie Martinon [1], Jonathan Smallwood [2], Colin Hamilton [1], Leigh Martin Riby [1]

[1] Northumbria University, Newcastle-upon-Tyne, UK; [2] University of York, York, UK

Prior research has relatively neglected to identify how mind-wandering fits into the overall neuro-cognitive profile of older adults. Using an EEG methodology, this study aimed to establish differences in patterns of brain activity associated with mind-wandering in an ageing population. We recorded EEG and behavioral responses during three different tasks: namely at rest, during an N-back task with thought probes, and whilst visualizing past and future events. The pattern of slowing in older and younger adults' EEG profiles was examined. The results indicated that EEG oscillation patterns can be linked to the type of thoughts that occur during mind-wandering. Thus, these findings suggest that it is important to further investigate age-related changes with an integrated EEG and cognitive methodology approach.

**A-0339 The role of right-dominant prefrontal theta oscillations during REM-sleep in the consolidation of emotional episodic memories.**

Roxanne Sopp[1,2], Tanja Michael[1], Hans-Günter Weeß[3], Axel Mecklinger[2]

[1] Clinical Psychology and Psychotherapy Unit, Saarland University, Saarbrücken, Germany [2] Experimental Neuropsychology Unit, Saarland University, Saarbrücken, Germany [3] Interdisciplinary Sleep Laboratory, Pfalzklinikum Klingenmünster, Klingenmünster, Germany

The current study aimed at disentangling the effects of different sleep stages on the consolidation of emotional memories by contrasting the impact of REM sleep and slow wave sleep (SWS) on item and source memory retention of emotional and neutral pictures. Emotional item memory was enhanced after sleep irrespective of sleep type. However, source memory for screen locations was modulated by sleep type with SWS selectively benefitting source memory for neutral pictures and REM sleep selectively favoring emotional source memory. Moreover, emotional source memory performance post sleep was correlated with right-frontal theta power during REM sleep. The results support the relevance of REM sleep in forming memories of emotional stimuli and the context in which they occurred.

**A-0347 Learning item-position associations in immediate serial recall**

Simon Fischer-Baum [1], Charli Holloway [1], Jill Warker [2]

[1] Rice University, Houston, USA [2] University of Scranton, Scranton, USA

Learning position-specific constraints is critical for different cognitive domains (e.g. phonotactic learning). A series of experiments show learning of item-position associations in immediate serial recall. Sequences of six items were grouped into two three-item subsequences. Experiment 1 (Words) and Experiment 2 (Shapes) demonstrate learning of absolute constraints (i.e. "marsh" only the first item in a group). Experiment 3 (Words) demonstrates learning of probabilistic constraints (i.e. "marsh" first item in a group 50% of the time). These results correspond to phonotactic learning, suggesting a domain-general mechanism is responsible for constraint learning. However, Experiment 4 (Words) shows that arbitrary

constraints (i.e. “marsh” is the 1st or 6th item) are learned as well as grouping-based constraints.

**A-0348 The Paradoxical Effects of Prediction Error**

Jeffrey D. Wammes, Vanessa L. Morris, Myra A. Fernandes
University of Waterloo, Waterloo, Canada

When exposed to repeated image triplets, brain activation patterns in participants’ fMRI data were predictive of the third image. Memory for the predicted third image was weakened if that image was changed (Kim et al., 2014). Here, participants studied repeated word-image sequences, and rated the degree to which each pair belonged together. Later, words were paired with new images that varied in how they differed from the initially paired image. When new images were from a different category, memory for the word was weakened. Conversely, when they were from the same category but highly visually dissimilar, memory was improved. Results indicate that the effect of prediction error can vary depending on whether the changed image maintains the original context’s gist.

**A-0349 The drawing effect: Learning terms and definitions**

Jeffrey D. Wammes, Melissa E. Meade, Myra A. Fernandes
University of Waterloo, Waterloo, Canada

We examined whether drawing to-be-remembered definitions from university textbooks would improve later memory, relative to a more typical strategy of transcription. Results indicated that drawing a picture representative of the definition, relative to writing it out, conferred a reliable memorial that was robust, even when participants’ preexisting familiarity with the terms was included as a covariate (in Experiment 1) or when the to-be-remembered terms and definitions were fictitious (in Experiment 2). In Experiment 3, we showed that paraphrasing during encoding, which, like drawing, requires self-generated elaboration, led to a memory enhancement comparable to drawing. Results suggest that drawing is a powerful tool which improves memory, and that drawing produces a similar level of retention as does elaborative encoding through paraphrasing.

**A-0356 Evidence for separable serial order STM systems: A case study approach**

Yingxue Tian, Simon Fischer-Baum
Rice University, Houston, USA

Several recent neuropsychological studies report dissociations between item short-term memory (STM) and serial order STM in the verbal and nonverbal domains. Is serial order STM a domain-general capacity? Or are there separate serial order STM systems for verbal and nonverbal material? We report a single case study of an individual with an acquired STM deficit (MB). Within the verbal domain, MB has a more severe deficit in serial order STM than item STM. If serial order STM is domain-general, MB should also have difficulty in serial order tasks with nonverbal materials. However, his nonverbal item and serial order STM are preserved. Our results suggest that there are separate serial order STM systems for verbal and nonverbal materials.

**A-0373 Sleep-dependent memory consolidation in children with sleep-disorders**

Eszter Csabi [1], Palma Benedek [2], Karolina Janacsek [3], Zsofia Zavecz [3], Gabor Katona [2], Dezso Nemeth [3]
[1] Institue of Psychology University of Szeged, Szeged, Hungary [2] Heim Pal Children Hospital, Budapest, Hungary [3] Institute of Psychology Eötvös Loránd University, Budapest, Hungary

A largest body of evidence suggesting that sleep can improve the offline memory consolidation. In the present study we examined the effect of sleep disorder on declarative and non-declarative memory consolidation by testing children with sleep-disordered breathing (SDB). We used a story recall task to measure declarative memory and Alternating Serial Reaction Time task to assess non-declarative memory. There were two sessions: a learning phase and a testing phase, separated by a 12-hour offline period with sleep. We found that declarative memory consolidation was impaired while the offline consolidation of non-declarative memory was preserved in SDB group in both sequence-specific and general skill learning. These findings suggest that sleep disorders in childhood have a different effect on different memory processes.

**A-0375 The forward effect of testing in motor memory**

Tobias Tempel, Christian Frings
University of Trier, Germany

We investigated the effects of retrieving motor sequences from memory on subsequently learned motor sequences. Participants learned several sets of motor sequences in separate parts of a learning phase. Each part was followed by one of three tasks: retrieval of the items of the current learning-phase part, restudy of these items, or an unrelated distractor task. A final test required the recall of items from all learning-phase parts. Recall of motor sequences that were learned after a previous item set had been retrieved was better than recall of motor sequences that had been learned after the previous item set had been restudied or after an unrelated distractor. The results additionally suggest that retrieval caused a reset of encoding.

**A-0376 Can testing effects be socially shared?**

Magdalena Abel [1,2], Henry L. Roediger [2]
[1] Regensburg University, Germany; [2] Washington University in St. Louis, USA

Retrieval practice compared to restudy enhances memory and reduces time-dependent forgetting, a finding known as the testing effect. While prior work shows that overt and covert forms of retrieval practice entail the same benefit for memory, it is unclear if this finding generalizes to a social context. When one individual engages in retrieval practice out loud while another individual listens and engages in silent practice, do both show the same benefit? The results of two experiments indicate that the answer is yes – and no. While subjects in our experiments showed the same reduction in time-dependent forgetting, overt retrieval practice by speakers boosted memory performance to a much higher degree than covert retrieval practice by listeners.

**A-0388 The nature of false recognition in Mesial Temporal Lobe Epilepsy: associative illusions make the difference.**

Mariana Cairós [1], Ruth Marrero-Abrante [2], José Flores [3], María A. Alonso [1,4]
[1] Universidad de La Laguna, Spain, [2] Complejo Universitario de Canarias, Spain [3], Hospital Universitario Nuestra Señora de Candelaria, Spain [4], Instituto Universitario de Integración en la Comunidad (INICO), Salamanca, Spain

The main aim of this study was to analyse the role played by the associative and semantic activation on the false memories of individuals with Mesial Temporal Lobe Epilepsy (mTLE), using the Deese-Roediger-McDermot (DRM) paradigm. We used 24 word lists that were either associatively or semantically related to the same not studied critical item. Participants were 18 mTLE subjects and 17 healthy control subjects. Significant differences were found between mTLE and controls in false recognition, with patients showing more false alarms of all types than

controls. More interestingly, patients showed a statistically significant higher rate of false recognition than controls after studying associative lists. The results are discussed in regard to the “Activation / Monitoring Theory” and “Fuzzy Trace Theory”.

**A-0392 No Fast Mapping learning advantage for healthy young adults in lexical integration**

Elisa Cooper, Andrea Greve, Richard N. Henson
Medical Research Council, Cognition and Brain Sciences Unit, Cambridge, UK

Fast Mapping (FM) refers to incidental encoding of new information, via deductive inference and semantic context. FM is hypothesized to allow rapid, hippocampal-independent memory formation, unlike typical, intentional explicit-encoding (EE). Coutanche and Thompson-Schill (2015) reported slower response times to lexical neighbours of words that adults had learned under FM than EE, suggesting better lexical integration. We replicated their between-subjects paradigm in 2 groups of 22 young adults, with same-day testing. We found a main effect of learning, whereby semantic decisions to lexical neighbours of new words were slower than matched control words, but did not find any significant interaction with FM versus EE. We conclude that FM benefits over EE are difficult to demonstrate in healthy adults.

**A-0393 Neural habituation to painful stimuli is modulated by dopamine: evidence from studies using EEG and pharmacological fMRI**

Eva M. Bauch[1], Christina Andreou [2], Nico Bunzeck[1,3]
[1] Department of Systems Neuroscience, University Medical Center Hamburg-Eppendorf, Martinistrasse 52, 20246 Hamburg, Germany [2] Center for Gender Research und Early Detection, Kornhausgasse 7, 4051 Basel, Switzerland [3] Department of Psychology, University of Lübeck, Ratzeburger Allee 160, 23562 Lübeck, Germany

Pain perception depends on the absolute magnitude of pain but it is also influenced by contextual predictions. We investigated the temporal dynamics (EEG) and brain regions (fMRI) involved in absolute and context-dependent coding; and their link to dopaminergic neuromodulation. Context-dependent coding was associated with a frontal ERP effect at ~600ms that was pinpointed to the insula; and absolute coding was associated with a frontocentral ERP effect at ~600ms. Importantly, under placebo treatment activity in postcentral gyrus increased with pain magnitude only in the beginning and subsequently habituated. In contrast, absolute coding was also present at the end under haloperidol treatment. Thus, dopaminergic neuromodulation seem to play an important role for the habituation to painful stimuli over time.

**A-0395 Investigating the temporal dynamics of retrieving new “foil” semantic and phonological information**

David A. Vogelsang[1,2], Matthias Gruber[4], Zara M. Bergström[3], Charan Ranganath[4,5], Jon S. Simons[1,2]
[1] Department of Psychology, University of Cambridge, Downing Street, Cambridge CB2 3EB, UK [2] Behavioural and Clinical Neuroscience Institute, University of Cambridge, Downing site, CB2 3EB, UK [3] School of Psychology, Keynes College, University of Kent, Canterbury, Kent CT2 7NP, UK [4] Center for Neuroscience, University of California at Davis, CA 95618, USA [5] Department of Psychology, University of California at Davis, CA 95616, USA

In this EEG experiment, we investigated whether incidental encoding of semantic versus phonological new “foil” words during an old/new memory test involves cortical reinstatement of the initial semantic versus phonological neurocognitive processes. Time-frequency analysis of the initial study phase revealed that semantic compared to phonological processing was associated with alpha decreases in left frontal electrodes. Results from the test phase revealed that decreases in alpha and theta oscillatory activity specifically in left frontal electrodes differentially predicted successful memory formation for semantic and phonological foils on a final surprise memory test. These results suggest that attempting to retrieve semantic versus phonological information involves reinstating the distinct neurocognitive operations that were engaged during initial encoding.

**A-0396 Metamemory accuracy: the comparison of post-decision wagering and confidence ratings in action self-monitoring task.**

Ewelina Cichoń [1], Łukasz Gawęda [2], Remigiusz Szczepanowski [1]
[1] SWPS University of Social Sciences and Humanities, Wroclaw, Poland; [2] Medical University of Warsaw, Warsaw, Poland

Our research investigated accuracy of metacognitive judgments on self-monitoring using post-decision wagering (PDW) engaging economic categorization and confidence ratings scale (CRs) with numerical taxonomy of confidence. We hypothesized that more accurate metacognitive judgments are the PDW categorizations engaging experience-based processes than the subjective CRs involving theory-based processes. To examine such hypothesis, participants were exposed to an action memory task where actions were performed or imagined. Participants’ responses were rated with metacognitive judgments during the memory recognition phase. The analysis of metacognition with a knowledge corruption (KCI) and monitoring resolution measures showed improved accuracy of PDW as opposed to the CR scale for memory responses. These results imply that experience-based processes produce more accurate metamemory with regard to self-monitoring operation.

**A-0398 Modulation of semantic and associative false recognition by transcranial Direct Current Stimulation (tDCS) of the left temporal lobe**

Antonio M. Díez [1], Idaira Fernández [2], Carlos J. Gómez-Ariza [3], Emiliano Díez [1,4], María A. Alonso [2,4], Angel Fernandez [1,4]
[1] Universidad de Salamanca, Spain; [2] Universidad de La Laguna, Spain; [3] Universidad de Jaén, Spain; [4] Instituto Universitario de Integración en la Comunidad INICO, Salamanca, Spain

Previous research has shown that tDCS of the temporal lobe while participants study lists of related words has effects on the false recognition of non-presented words. To further explore the modulation of false recognition by tDCS, we conducted two DRM experiments in which tDCS (anode/cathode/sham) was applied over the participants' left anterior temporal lobe (ATL) (Experiment 1) and the left posterior inferior temporal lobe (PITL) (Experiment 2) during the study of word lists that were either semantically or associatively related to their non-presented critical words. Anodal tDCS over left ATL reduced the false recognition of critical words from associative lists, while anodal tDCS over left PITL increased the false recognition of critical words from both semantic and associative lists.

**A-0402 Altering the psychological distance of positive and negative events**

S. Azrin Jamaluddin [1], Melanie K. T. Takarangi [2], Steve M. J. Janssen [1]
[1] University of Nottingham – Malaysia Campus, Semenyih, Malaysia; [2] Flinders University, Adelaide, Australia

Psychological distance refers to how long ago and how far away an event feels. Generally, people tend to feel close to positive events and distant from negative ones. However, people with many self-reported PTSD and depression symptoms often feel close to negative events and distant from positive ones, respectively. The present study examined whether describing an event affected its psychological distance. After reporting their PTSD and depression symptoms, participants nominated the most positive and negative events of their lives but subsequently only described one of them. Describing the event did not affect the psychological distance of positive events but made negative events feel more distant. This finding is important, because altering psychological distance may have therapeutic benefits.

**A-0403 Schemas facilitate memory for both congruent and incongruent information**

A. Greve, E. Cooper, R. Tibon, A. Lopez, R. Henson
Cognition and Brain Sci. Unit, Cambridge, United Kingdom

Memory is generally superior for new information that is congruent with existing schemas, yet also often superior when that information conflicts with schemas. We established schemas by training ordinal relationships between different numbers of randomly-paired objects. Memory was tested for trials that were schema congruent (Schema-Congruent), incongruent after schema formation (Post-Schema-Incongruent) or incongruent before schema formation (Pre-Schema-Incongruent). Memory for pairings of specific numbers of objects followed the pattern: Post-Schema-Incongruent > Pre-Schema-Incongruent > Schema-Congruent, whereas memory for the ordinal relationship between pairings simultaneously showed the pattern: Schema-Congruent > Pre-Schema-Incongruent = Post-Schema-Incongruent. These data demonstrate schemas can augment memory for congruent and incongruent information and suggests that congruent information aids memory retrieval, while incongruent information evokes prediction errors, aiding memory encoding.

**A-0404 Extracting meaning from our personal past and future: a comparative view of the content and role of autobiographical reasoning for past and future events**

Alexandra Ernst, Arnaud D'Argembeau
Psychology and Neuroscience of Cognition Unit, Department of Psychology, University of Liege, Belgium

Personal identity is nourished by autobiographical memories and future thoughts, but little is known about the mechanisms that contribute to link personal events to the self. To investigate this issue, we explored the narrative content and functional roles of autobiographical reasoning (AR) for past and future personal events. For both temporal directions, AR frequently relied on the evocation of personal characteristics. Comparatively, AR for the past included more autobiographical facts and had a higher identity function, whereas AR for the future involved more personal goals, themes of success/achievement, and a higher life satisfaction. Overall, these findings indicate both similarities and differences in the narrative content and functional roles of AR for past and future events.

**A-0405 The influence of self-relevant and self-generated cues on autobiographical memory retrieval**

Alexandra Ernst [1], Jef Durner [2], Chris J. A. Moulin [3]
[1] Psychology and Neuroscience of Cognition Unit, Department of Psychology, University of Liege, Belgium [2] University of Burgundy, Dijon, France [3] Laboratory of Psychology and NeuroCognition, LPNC UMR CNRS 5101, Grenoble, France

While most autobiographical memory (AM) studies use verbal cues to prompt memories, little is known about the influence of cue type on AM retrieval. In this study, participants (n = 71) first generated statements about themselves (self-images) and about a French celebrity (other-images). Participants then underwent an AM fluency task using three types of cues: self-images, other-images and experimenter-provided cues (e.g. car). As expected, participants rated cues and memories from the self-image condition as the most personally significant. Regarding AM fluency, no difference was observed between the self-image and the experimenter-provided cues, both producing more memories than other-cues. Overall, our findings suggest a moderate benefit of self-relevant cues on AM retrieval, but no direct benefit of self-generated cues.

**A-0409 From mice to men: Improving human hippocampal memory with green tea**

Andrea L. Wantz, Fred W. Mast
Department of Psychology, University of Bern, Bern, Switzerland

Hippocampal neurogenesis is an essential mechanism for memory and is regulated by several nutritional factors, for example, by epigallo catechin-gallate (EGCG), prominently found in green tea. The goal of this study was to test whether green tea improves human hippocampal memory. Participants performed on a pattern separation and a spatial memory task and two control tasks before and after 20 days with green tea or control (nettle) tea. The teas were distributed in counterbalanced order in a double-blind design, separated by a wash-out phase. Green tea did not generally improve hippocampal memory, but exploratory analyses suggest that coffee and berry consumption predicted the benefit from green tea. This study translates animal research, suggesting that EGCG can improve human hippocampal memory.

**A-0411 Cortisol levels influence recognition of trauma related contents**

Alexandra-Heike Gräbener [1,2], Johanna Lass-Hennemann [2], Elena Holz [2], Tanja Michael [1,2]
[1] International Research Training Group "Adaptive Minds" (GRK 1457) [2] Clinical Psychology and Psychotherapy Unit, Saarland University, Saarbrücken, Germany

The aim of the present study was to examine if repeated cortisol administration inhibits experimentally induced intrusions and recognition memory in a trauma-film-paradigm. In a randomized double-blind design participants were exposed to a traumatic film and received either cortisol or placebo on three days following "trauma exposure". Contrary to our predictions, the cortisol group did not have fewer intrusions than the placebo group nor did it show diminished performance on the recognition test. However, high cortisol levels post film were associated with recognition performance, thereby supporting the idea that cortisol enhances consolidation. Our results show that cortisol administration after trauma experience cannot reduce retrieval by itself but emphasizes the role of cortisol in modulating episodic memory.

**A-0420 Hippocampal pattern completion at 7T-fMRI**

Paula Vieweg [1], Carla Bilsing [1], Jennifer Faber [2,3], Rüdiger Stirnberg [2], Daniel Brenner [2], Tony Stöcker [2], Thomas Wolbers [1,4]
[1] Aging & Cognition Research Group, German Center For Neurodegenerative Diseases DZNE, Magdeburg, Germany [2] German Center For Neurodegenerative Diseases DZNE, Bonn, Germany [3] Neurology Clinic, University Hospital Bonn, Bonn, Germany [4] Center for Behavioral Brain Sciences, Magdeburg, Germany

Memory retrieval from partial input requires the reactivation of memory traces, a mechanism termed pattern completion. In this 7T-fMRI study, we investigated the neural basis of age-related pattern completion differences. We employed a scene recognition paradigm, and asked healthy younger and older adults to identify complete or partially masked scenes in the scanner, half of which they had learned previously. Recognition accuracy was reduced with decreasing stimulus completeness. This was more pronounced in older adults, suggesting that pattern completion is adversely affected by aging. Intriguingly, older adults also showed a bias toward pattern completion when only partial information was available. Multivariate pattern similarity in hippocampal subfields differed for different levels of stimulus completeness and stimulus type.

**A-0421 Revisiting the misinformation effect: Does reconsolidation overwrite existing memories?**

Tom E. Hardwicke, David R. Shanks
University College London

The classic 'misinformation effect' powerfully demonstrates the inherent fallibility of human memory and the potential shortcomings of eyewitness

testimony. Reconsolidation theory has recently generated renewed interest in the 'destructive updating' account which suggests that exposure to contradictory misinformation results in the 'overwriting' of event memory traces. We tested this prediction using a hybrid reconsolidation-misinformation paradigm and a procedure designed to minimize the influence of confounding factors unrelated to memory impairment (the 'Modified Test'). Across three experiments, we replicated classic misinformation effects using conventional tests, but found no evidence of memory impairment using the Modified Test. Meta-analysis and Bayes Factors suggest that Modified Test outcomes provide more evidence in favour of the null hypothesis relative to the reconsolidation-overwriting hypothesis.

**A-0422 Boundaries between contextual fear memory reconsolidation and extinction**

Lindsey F. Cassini, Jonathan L. C. Lee, Charlotte R. Flavell
University of Birmingham, UK

Re-exposure to a previously fear-conditioned context can lead to both reconsolidation and extinction. Here we show in contextual fear memories a "null point" of 10-15-min re-exposure between the parameters that induce reconsolidation (5 min) and extinction (30 min), at which the memory is insensitive to any effect of MK-801. In parallel, the molecular mechanisms at these time points were explored using a flow cytometry technique. Hippocampal nuclei, extracted 90 minutes after re-exposure to the context, were immunolabelled for the neuronal marker NeuN and the immediate-early gene Zif268 to examine the relationship between Zif268 expression, freezing, and duration of exposure. It remains unclear whether the null point represents a population effect or if it exists at the level of the individual.

**A-0423 The Relationship between the Functions of Autobiographical Memory and Posttraumatic Stress Symptoms Varies with Age**

Adriana del Palacio-Gonzalez, Lynn A. Watson, Dorthe Berntsen
Center on Autobiographical Memory Research, Department of Psychology, Aarhus University, Denmark

Past research has examined the normative functions (generative, reflective, ruminative, and social) of autobiographical memory across the lifespan. In the current study we examined whether specific functions were related to increased posttraumatic stress symptoms (PTSS) and whether the pattern would vary as a function of age across four age groups: 20-33; 34-45; 46-58; and 59-70 year-olds. In a large community Danish sample, the ruminative function of memories was related to higher PTSS across all age groups. The social function of memories was associated with greater symptoms among the younger adults, whereas higher reflective function was identified among the eldest group. Results are discussed in relation to normative versus abnormal functions of autobiographical memory in adult development.

**A-0440 Retrieval induced updating of unfamiliar face memories.**

Matthew Plummer, Zara Bergstrom, Stuart Gibson
University of Kent, Canterbury, United Kingdom.

Retrieval of episodic memories is thought to make memories temporally labile. During this period, episodic memory traces are susceptible to change by the incorporation of new information into the old trace, including any errors made during retrieval attempts. We examined whether memories for unfamiliar faces are subject to retrieval-induced changes. Participants underwent three phases; face learning, refresh recognition and a final face recognition test. Within the refresh phase, participants either engaged in active recognition attempts, or just passively re-experienced previously seen faces, with the prediction that only active retrieval should update face memories. This research has important implications for theoretical accounts of episodic retrieval, and for informing the procedures of eyewitness memory testing.

**A-0443 On the relationship between implicit and explicit memory and processing fluency**

Chris Moulin [1], Jonathan Fortier [2]
[1] LPNC CNRS 5105, Université Grenoble Alpes, France; [2] LPPL EA 4638, Université d'Angers, France

A unitary memory system, combining explicit and implicit subsystems has been proposed, based on the analysis of implicit performance categorized by explicit decisions (e.g. Berry, Shanks & Henson, 2008). That is, implicit performance (reaction time to read a briefly presented stimulus) systematically varies for hits, false alarms, misses and correct rejections. We tested whether this apparent unitary nature could be explained by processing fluency 'leaking' into explicit decisions. We used an implicit task based on perceptual degradation and manipulated fluency. We replicated the pattern from Berry et al. However, altering the fluency with which words could be read did not influence explicit responses; we do not simply 'read off' information from implicit processing. We discuss a dual process account.

**A-0444 Moving Towards Memory: Does the onset of independent locomotion enable more flexible episodic memory during the first postnatal year of human life?**

Alexandra Houston, Sinéad Mullally
Institute of Neuroscience, Newcastle University, UK

A previous study reported that crawling infants demonstrated more flexible memory retrieval compared to their non-crawling counterparts (Herbert et al., 2007). We present data from a cohort of infants (n=95) demonstrating their performance on a deferred imitation task when aged 7.5 months old and again for a subset of these infants when aged 9.5 months old (n=48). Independent locomotion onset and duration were examined at both stages and was not restricted exclusively to crawling. Results are discussed in terms of whether independent locomotion does appear to provide a mnemonic advantage to infants who have achieved this developmental milestone compared to less mobile peers, within the critical time period when it is argued that the rudiments of declarative memory first emerge.

**A-0459 Vocabulary acquisition during sleep**

Marc Alain Züst [1], Simon Ruch [1], Roland Wiest [2], Katharina Henke [1]
[1] Department of Psychology & Center for Cognition, Learning and Memory, University of Bern, Switzerland; [2] Support Center for Advanced Neuroimaging (SCAN) & Institute of Diagnostic and Interventional Neuroradiology, University Hospital of Bern, Switzerland

Can we learn while asleep? To investigate this dream of mankind, we presented pairs of German words and fictitious translations for vocabulary acquisition during deep sleep. After waking, participants performed two implicit memory tests: 1) a cued-recall test and 2) a (re)learning test. For (re)learning, participants committed sleep-played translations and novel translations to memory during four learning runs. Functional MRI was performed during the cued-recall test. Behavioral data in both implicit tests evidenced unconscious relational word encoding during sleep. Hippocampus supported unconscious retrieval performance: the larger the hippocampal signal during retrieval, the better relational retrieval performance and the larger word pair-evoked EEG activity during sleep. We conclude that paired-associative memory encoding during deep sleep is feasible and supported by hippocampus.

**A-0460 Sleep quality affects event-based prospective memory in a supine posture only: A hierarchical multinomial-model-based**

**analysis**

Mateja F. Böhm, Ute J. Bayen, Marie Luisa Schaper
Heinrich-Heine-University, Düsseldorf, Germany

Muehlhan, Marxen, Landsiedel, Malberg and Zaunseder (2014) suggested that sleep quality affects cognitive performance, depending on body posture. We investigated whether this finding is transferable to prospective memory (PM), which is remembering to carry out intentions. PM includes a prospective component (remembering that something needs to be done) and a retrospective component (remembering what needs to be done and when). 50 participants were randomly assigned to either supine or upright posture. The PM task was embedded in an ongoing color-matching task. Hierarchical multinomial modeling revealed positive correlation of sleep quality with PM performance and the prospective component in supine posture, but not in upright posture. Limitations of the study and possible implications for fMRI studies are discussed.

**A-0465 Retrieval Induced Forgetting in Children with Autism Spectrum Disorders**

Robert Keasley [1], Jo Saunders [2], Phil Reed [1]
[1] Swansea University, Swansea, UK; [2] University of Strathclyde, Glasgow, UK

Individuals with Autism Spectrum Disorders (ASD) have well documented memory impairments. Two studies used the Retrieval Induced Forgetting (RIF) paradigm to investigate recall in children with ASD and typically-developing children matched by verbal language ability. In both studies, children with ASD showed greater RIF than typically-developing children suggesting children with ASD show more inhibition than typically-developing children. In Study 2, level of ASD traits (measured by the Autism Quotient, AQ) was compared to RIF, increased RIF, was linked to impaired Attention to Detail, and Attention Switching, on the AQ. It was concluded that impaired attention may be linked to increased inhibition of memories and may underlie memory problems often experienced by individuals with ASD.

**A-0471 Social memory inflation: The consequences of lying on how a listener remembers their childhood memories**

Jolee Davis, Charles Stone, Johanna Hellgren
John Jay College of Criminal Justice, New York, New York, USA

Recent research suggests that lying to oneself about the past can lead to increased confidence in the occurrence of false childhood events. The present study extends this line of research to instances in which a speaker is intentionally lying to a listener about the listener's personal past. The present results suggest that a liar can increase the confidence a listener has in the occurrence of false childhood events, what we have termed, "social memory inflation." Critically, however, the extent to which social memory inflation occurs depends on the trustworthiness and expertise of the speaker.

**A-0472 Memory conjunction errors in recognition: Proposal of triple-process framework**

Tetsuji HIrano [1], Takashi Tsukimoto [2]
[1] Osaka University of Human Sciences, Osaka, Japan; [2] Gifu University, Gifu, Japan

We propose and explore the role of three retrieval processes, correct event recovery, false event recovery, and derivative-based recovery, on memory conjunction error phenomenon having been investigated through a recognition test. The former two processes are both defined as retrieval processes that are able to perceptually reproduce one's experienced event, whereas the latter is a process that collects various kinds of information about a recognition test item, e.g., its meaning or its related event(s). We define the relationship between them and provide the way to calculate the probability of each process, named of PDP-θ (a dissociation procedure of TH (θ) ree processes). We applied PDP-θ to an experiment. The significance of three retrieval processes is discussed.

**A-0474 Memory consolidation during rest**

Hui Zhang[1], Juergen Fell[2], Christian E. Elger[2], Nikolai Axmacher[1]
[1] Department of Neuropsychology, Institute of Cognitive Neuroscience, Faculty of Psychology, Ruhr University Bochum, Bochum, 44801, Germany
[2] Department of Epileptology, University of Bonn, Bonn, 53127, Germany

While abundant data from rodent experiments show reactivation of stimulus-specific activity after learning, only limited evidence exists in humans. No previous study has linked human "ripple" oscillations to replay of stimulus-specific activity patterns. Here, we address on this question using ECoG data from 12 epilepsy patients. Patients learned two sets of pictures before and after an afternoon nap. We found that during encoding, the brain established stimulus-specific topographical activity patterns in the broadband range (30-150Hz). These representations were spontaneously reactivated during awake resting state and sleep. Replay was reduced before hippocampal "ripple" oscillations. These data are the first to show that stimulus-specific activity at network level is reactivated after learning, and suggest that ripples serve to maintain these reactivations.

**A-0475 Updating memories in the hippocampus and medial prefrontal cortex**

Silvy H.P. Collin, Branka Milivojevic, Christian F. Doeller
Donders Institute, Radboud University, Nijmegen, the Netherlands

A key feature of episodic memory is the integration of multiple events into coherent mnemonic networks. However, it remains unclear how these networks are updated and how new information is integrated. In two fMRI-studies, we presented life-like events that were integrated into narratives on Day 1, and presented those same events along with new events on Day 2. In Experiment 1, we observed higher neural similarity between new events and consolidated narratives in the hippocampus. When updated information is consistent with the narratives, we observed additional higher neural similarity in the medial prefrontal cortex (mPFC; Experiment2). Together, these results show that episodic memories are dynamic and undergo systematic transformation in hippocampus and mPFC when new information comes to light.

**A-0483 Investigating the neural basis of recollection processes in adults with autism**

Rose Cooper [1], Franziska Richter [1], Simon Baron Cohen [2], Paul Bays [1], Jon Simons [1]
[1] Department of Psychology, University of Cambridge, Cambridge, UK; [2] Autism Research Centre, Department of Psychiatry, University of Cambridge, Cambridge, UK.

Adults with autism exhibit deficits in recollection, but the neural basis of such deficits is largely unknown. The current study used functional neuroimaging (fMRI) combined with a memory task during which participants (20 control, 19 autism) reconstructed the appearance of object-scene displays using a continuous dial. The autism group showed a more pronounced reduction in recollection accuracy than recollection precision. Both groups showed activity in recollection network regions during encoding and retrieval, however, the autism group showed a reduced correspondence between encoding activity and subsequent memory accuracy. The groups also showed different patterns of functional connectivity during recollection, such as between hippocampal and prefrontal regions. The results provide evidence for impaired retrieval monitoring and recollection network dysfunction in autism.

**A-0484 Neural correlates of memory for internal thoughts versus external stimuli experienced in natural settings**

David Stawarczyk, Olivier Jeunehomme, Arnaud D'Argembeau
University of Liège, Liège, Belgium

To investigate the brain regions supporting the remembrance of internal thoughts versus external events, we asked participants to perform a short walk while wearing a lifelogging device that continuously and automatically took pictures. In a subsequent fMRI session, they were shown brief sequences of pictures from their walk and were asked to remember either external events or internal thoughts that they experienced while walking. Results showed that remembering internal thoughts activated the medial prefrontal cortex and temporal poles to a greater extent than remembering external events, whereas remembering external events was associated with higher activation in lateral frontoparietal regions. These findings suggest that memory for internal thoughts involves the reactivation of brain regions supporting the initial formation of these thoughts.

**A-0485 Item-memory and source-memory predictions in schema-based source monitoring**

Marie Luisa Schaper [1], Beatrice G. Kuhlmann [2], Ute J. Bayen [1], Armin-Laszlo Halbach [1]
[1] Heinrich Heine University Düsseldorf, Germany; [2] University of Mannheim, Germany

Schema fit between item (e.g., object) and source (e.g., room) affects source memory (better for inconsistent pairings) but not item memory. We investigated metacognitive awareness of this inconsistency effect and ability to distinguish item and source memory. Participants either predicted their likelihood of remembering the item, the source, or both. Source memory for inconsistent pairings (e.g., toothpaste in kitchen) was comparable to (after source-memory predictions) or better than (after exclusive item-memory predictions) for consistent pairings (e.g., toothpaste in bathroom). In contrast, participants predicted better item and, especially, source memory for schema-consistent pairings. This effect was smaller in item-memory predictions when source-memory predictions were additionally asked for, showing that participants can distinguish effects on item versus source memory.

**A-0486 FLASHBULB MEMORIES: BEYOND THE CANONICAL CATEGORIES**

Barbara Muzzulini, Federica Destefanis, Susanna Schmidt, Carla Tinti
Department of Psychology, Turin, Italy

Flashbulb memories are vivid and persistent memories of the circumstances in which one first learned about an unexpected and emotional public event. As the content of these memories has traditionally been described by referring to the so-called 'canonical categories', we aimed to verify if participants only reported details within these categories or whether there were further ones that could characterize flashbulb memories. Participants were asked to retrieve and freely recall the image they had in mind of the moment in which they first learned about the resignation of Pope Benedict XVI. By using a test re-test method and a content analysis, other categories could be identified, suggesting that canonical categories may not be the only ones making up flashbulb memories.

**A-0488 How Working Memory and Math Anxiety are Related to Math Performance in Primary School Children?**

Maria Chiara Passolunghi [1], Sandra Pellizzoni [1], Fabio Del Missier[1,2]
[1] Department of Life Sciences–Psychology Unit "Gaetano Kanizsa", University of Trieste, via Weiss 21, 34128, Trieste (TS), Italy [2] Department of Psychology, Stockholm University, Frescati Hagväg 14 SE-106 91 Stockholm

Both working memory (WM) and math anxiety (MA) are related to proficiency in mathematics. Previous studies have suggested that a sizable fraction of children in primary and secondary school suffer from MA, which is negatively correlated with calculation skills. Processing efficiency and attentional control theories suggest that anxious feelings hinder performance by affecting WM, but WM also contributes to math performance per se. We carried out two individual-difference investigations on fourth and fifth graders to elucidate the relationships between WM, MA, and math problem solving and calculation. Structural equation modeling showed that WM and MA contribute independently to math performance (the former more than the latter), even when controlling for their interrelationship and for processing speed.

**A-0489 Resting state EEG activity as predictor of spatial working memory performance?**

Adeline Jabès, Paolo Ruggeri, Pierre Lavenex
Laboratory for Experimental Research on Behavior, Institute of Psychology, University of Lausanne, Lausanne, Switzerland

Resting state EEG activity has been reported to predict IQ (Thatcher et al., 2005) and working memory performance (Kaminski et al., 2011) in healthy individuals. However, the link between brain spontaneous activity and specific cognitive functions has been sparsely investigated. In this study, we recorded resting state EEG from 20 healthy participants (18-31 years of age; M=21.61; SD=2.90) and tested them in a real world allocentric spatial memory task. We aimed to characterize an electrophysiological signature of the brain resting state activity, which could be used to predict spatial working memory performance in healthy individuals. Describing potential biomarkers of memory abilities will allow to further our understanding on the neurobiological basis and organization of human memory functions.

**A-0493 Investigating DRM false memories susceptibility in near-death experiencers**

Charlotte Martial [1], Vanessa Charland-Verville [1], Hedwige Dehon [2], Steven Laureys [1]
[1] GIGA Research Center and Cyclotron Research Center, University and University Hospital of Liège, Liège, Belgium; [2] Cognitive and Behavioral Clinical Psychology Unit, Psychology and Neuroscience of Cognition Research Unit (PsyNCog), University of Liège, Liège, Belgium

Literature devoted to the cognitive functioning of individuals who lived a near-death experience (NDErs) is very limited. This study examines their susceptibility to false memories using the Deese–Roediger–McDermott paradigm (DRM; Roediger&McDermott, 1995). Specifically, 20 NDErs and 19 healthy volunteers matched on age, education and time since accident were presented with DRM lists for a recall task during which they were asked to assign "Remember/Know/Guess" judgements (Tulving, 1985) to their responses. Results showed that NDErs and volunteers were equally likely to recall studied items, to falsely recall critical lures and obtained similar rates of associated illusory recollection. These findings are discussed in light of the current theories of false memory production and accounts of NDE.

**A-0495 Short nap is useful for retaining the representation of forgetting**

Huang-Mou Lee
Department of Health Psychology, Chang Jung Christian University, Taiwan

The current study used DRM paradigm to investigate whether sleep can maintain the retrieval inhibition of to-be-forgotten (TBF) memory. After list method directed forgetting (DF) procedure the participants took a 30 minutes nap or played an easy computer game. Then all participants got a free recall and remember/know recognition test. The results showed only nap group still retained significantly DF effect in free recall and suffered inhibition release of TBF words in recognition. The game group had more false-remember judgment of critical words in TBF condition than to-be-

remembered condition. This study indicated that short nap not only improves memory consolidation but also maintains the representation of forgetting.

**A-0498 False Memories Within- and Across-Languages: A Portuguese-English Study**

Pedro B. Albuquerque [1], Maria Soledad Beato [2], Sara Cadavid [1]
[1] University of Minho, Portugal; [2] Universidad de Salamanca, Spain

We studied false recognition (FR) within- and across-languages using the DRM paradigm. Thirty-four native Portuguese speakers studied eight Portuguese (L1) and eight English (L2) lists. In the recognition test, critical words either matched or mismatched the language used to present their lists at study. Participants were instructed to recognize only studied words, and only when the language matched. Results showed that, although participants falsely recognized critical words in both within- and across-language conditions, FR was significantly higher in the within- than in the across-language conditions. Furthermore, FR was higher in Portuguese-Portuguese (L1) than in English-English (L2). Finally, there were significant differences between the rates of FR in across-language condition, with higher FR in Portuguese-English than in English-Portuguese.

**A-0500 Accessibility and characteristics of memories of the future**

Olivier Jeunehomme, Arnaud D'Argembeau
University of Liège, Liège, Belgium

Recent research suggests that some imagined future events are encoded in memory as “memories of the future.” However, little is known about the accessibility of these memories and their components. To address these questions, we investigated the free and cued recall of future simulations. Results showed that most future simulations were successfully encoded but that only a fraction of them were readily accessible after a one-week delay. We also found that persons and locations were the best recalled components of future simulations, and that the overall accessibility of future simulations was related to the clarity and familiarity of represented persons, the importance and emotional intensity of imagined events, and the feeling of pre-experiencing the imagined situations during their initial simulation.

**A-0505 Does overgeneral retrieval style facilitate or inhibit intrusive memory? Its relation to depressive symptoms**

Noboru Matsumoto [1,2], Toshihiko Sensui[3], Satoshi Mochizuki[1]
[1] University of Tsukuba, Ibaraki, Japan; [2] Research Fellow of Japan Society for the Promotion of Science, Tokyo, Japan; [3]Tokyo Seitoku University, Chiba, Japan

The present study examined the influence of overgeneral retrieval style on intrusive memories and its relationship to depressive symptoms by an experimental method. Forty-nine students completed depression scale, autobiographical memory test, and the trauma film paradigm. Subsequently, they reported intrusive memories from the trauma film in a diary for a week and 3 months later. Hierarchical regression analysis showed that number of intrusive memories over a week were related to low negative overgeneral memories in individuals with higher levels of depressive symptoms. Results also showed that intrusive memories 3 months later were associated with low negative overgeneral memories and higher levels of depressive symptoms. These results support the affect regulation function of overgeneral memory in analogue trauma stimuli.

**A-0506 Free and serial recall where inter-item spacing is compressed to mimic psychological time**

Denis McKeown [1], Priya Varma [2]
University of Leeds, UK

The serial position function or curve has for decades been influential in shaping models of human memory over the short term; and almost universally the items to be recalled have been arranged to be spaced in regular intervals of 'physical time.' Yet it is believed that psychological time is compressive, so that items more distant from the present are increasingly less temporally isolated from their neighbours. In this study of free and serial recall conditions are compared where words for recall are spaced in either a contracting series of inter-item intervals (in an attempt to achieve equal spacing in psychological time) or an expanding series or randomly. Functions of behavioural free and serial recall are reported for each condition.

**A-0510 The influence of environmental context on judgments of learning**

Maciej Hanczakowski [1], Katarzyna Zawadzka [2]
[1] Cardiff University, UK; [2] Nottingham Trent University, UK

Judgments-of-learning (JOLs) are assessments of future memory performance elicited during study of to-be-remembered materials. In the present study, we assessed how JOLs are affected by changes in environmental context between the first and the second study cycles. Participants studied pairs of words against a background of distinctive photographs. In the second study cycle, the same pairs were restudied but contextual photographs were manipulated: pairs were presented against reinstated, familiar or novel backgrounds. The influences of context familiarity and context reinstatement were assessed. Whereas context reinstatement repeatedly increased JOLs, there was no effect of context familiarity. These results contrast with previous investigations of context effects on metacognitive judgments (confidence and feeling-of-knowing) for which both types of context effects have been documented.

**A-0511 The effects of bilateral TMS on probabilistic sequence learning**

Anna-B.C. Trimborn [1], Géza Gergely Ambrus [1], Karolina Janacsek [2], Gyula Kovács [1,3], Dezso Németh [2]
[1] Institute of Psychology, Friedrich Schiller University Jena, Germany [2] Institute of Psychology, Eötvös Loránd University, Budapest, Hungary [3] Department of Cognitive Science, Budapest University of Technology and Economics, Budapest, Hungary

Multiple lines of evidence point to frontal functions playing a competitive role in procedural/probabilistic learning, leading to the hypothesis that disruption of the functioning of the DLPFC should lead to an improvement in probabilistic memory tasks. To test this hypothesis our subjects performed the Alternating Serial Reaction Time (ASRT) task (25 blocks), interspersed with five blocks of 1 Hz TMS or sham stimulation of both left and right DLPFCs (5 + 5 minutes) after each epoch. To assess the lasting effects of TMS on sequence learning, the participants performed one ASRT epoch ten minutes, two hours, and 24 hours later. Our presentation will discuss how the bilateral disruption of DLPFC modifies the performance in probabilistic sequence learning.

**A-0512 Performance predictions and metamemory knowledge improve children’s prospective memory performance**

Milvia Cottini [1], Paola Palladino [1], Demis Basso [2]
[1] Department of Brain and Behavioral Sciences, University of Pavia, Italy; [2] Faculty of Education, Free University of Bozen-Bolzano, Italy

Compared to retrospective memory, little work has examined the role of metamemory in children’s prospective memory (PM). The present study aimed at investigating the influence of performance prediction and metamemory knowledge in children’s PM. Sixty children (seven-years-old)

performed two picture-classification tasks including different PM tasks, one with specific and one with categorical cues. After giving instructions, half of the participants had to predict their performances. Metamemory knowledge was evaluated using a story-task. Results revealed that retrieval of categorical cues was more difficult and resource demanding than retrieval of specific cues. Performance predictions improved performances in the categorical condition, whereas metamemory knowledge was related to performances in the specific condition. Performance predictions and metamemory knowledge seem to differently benefit children's PM.

**A-0514 Implicit memory for the content but not the speaker of sleep-played messages**

Simon Ruch [1,2], Romi Zäske [3], Marc Alain Züst [1,2], Stefan Robert Schweinberger [3], Katharina Henke [1,2]
[1] Department of Psychology, University of Bern, Bern, Switzerland; [2] Center for Cognition, Learning and Memory, University of Bern, Bern, Switzerland; [3] Department for General Psychology and Cognitive Neuroscience, Institute of Psychology, Friedrich Schiller University of Jena, Jena, Germany

We presented 28 sentences uttered by 28 unfamiliar speakers to sleeping participants to investigate whether humans can encode new verbal messages, learn voices of unfamiliar speakers, and form associations between speakers and messages during EEG-defined deep sleep. After waking, participants performed three tests which assessed the unconscious recognition of sleep-played speakers, messages, and speaker-message associations. Recognition performance in all tests was at chance level. However, response latencies revealed implicit memory for sleep-played messages but neither for speakers nor for speaker-message combinations. Only participants with excellent implicit memory for sleep-played messages also displayed implicit memory for speakers but not speaker-message associations. Hence, deep sleep allows for the semantic encoding of novel verbal messages.

**A-0516 The stability of identity-representations acquired through brief exposure**

Fabienne Windel [1], Géza Gergely Ambrus [1], Mike Burton [2,3], Gyula Kovács [1,4]
[1] Institute of Psychology, Friedrich Schiller University Jena, Germany [2] University of York, United Kingdom [3] University of Aberdeen, United Kingdom [4] Department of Cognitive Science, Budapest University of Technology and Economics, Budapest, Hungary

The development of representations of unfamiliar identities may arise rapidly, through experience of within-person variability (Andrews et al., 2015). We have tested the time-course of identity learning and retention in a sequential sorting task, where subjects had to categorize face images into two identities. Performance was tested with a same-different matching task, immediately, ten minutes, and 24 hours after training. We have observed increased hit rates for Trained versus Novel identities in the immediate and 10 minutes conditions, whereas after 24 hours performance was not different from a control group, which did not participate in the training phase.

**A-0518 Sleep's role in determining the fate of individual memories**

James W. Antony [1], Luis R. Piloto [1], Larry Y. Cheng [2], Paula A. Pacheco [1], Ken A. Paller [2], Ken A. Norman [1]
[1] Princeton University, Princeton, NJ, USA; [2] Northwestern University, Evanston, IL, USA

Learning-related sounds presented during sleep promote memory reactivation. Here we asked what occurs when two memories are simultaneously reactivated. Participants learned associations between sounds and picture locations. Some sounds were linked with two pictures (famous faces/places/common objects). Each picture was also assigned either high or low reward value. Participants napped while half of the sounds were softly presented during slow-wave sleep. Cues improved memory for object locations, as shown previously. We interrogated EEG activity following cues to shed light on memory competition. For critical object pairs, cues appeared to strengthen one "winning" representation while leaving the other unchanged. These procedures thus allow for novel investigations of the memory interactions between paired items that can promote either competition or integration.

**A-0519 A threshold for short-term memory consolidation.**

Michelle Ames, Denis McKeown, David Bunce
University of Leeds, Leeds, UK

In two experiments, young adults' non-verbal memory was tested using a visual dual-task design which included the encoding and recall of a briefly presented display of three symbols (e.g. & % !) followed by a two-choice processing speed task. The delay between encoding and the onset of the two-choice task was either 400, 800, 1600 or 3200ms. Performance on the primary symbol memory task was enhanced at delays above 1600 ms, consistent with recent findings that short-term non-verbal memory benefits from a period of time for short-term consolidation. Further, these data support the notion of a fixed threshold for processing costs rather than a continuous increase in performance given extended consolidation time.

**A-0521 Relationships between false memory and working memory**

Sara Cadavid [1], Maria Soledad Beato [2], Pedro B. Albuquerque [1]
[1] University of Minho [2] Universidad de Salamanca

In this study, we examined the relationship between working-memory (WM) and false recognition (FR) using the Deese/Roediger-McDermott (DRM) paradigm. Specifically, participants studied lists of words (e.g., cleric, cassock, priest, friar, monastery, nun) associated to three non-presented critical items (e.g., CHURCH, CLERGYMAN, MONK). To assess WM we used three WAIS subtests: Letter/Number Sequencing (LNS), Forward Digit Span (FDS), and Backward Digit Span (BDS). Results showed a robust false recognition effect (false alarms to critical words higher than false alarms to distractors). Furthermore, a significant positive correlation was found between FR and LNS. In contrast, there were no significant correlations between FR and both FDS and BDS. Further experimental research is needed to fully understand the interplay between WM and FR.

**A-0522 Children Don't Fear the Robot Inquisition: The Effect on Memory of Misleading Information from a Robot**

Deborah K. Eakin, Alexis Jones, Cindy Bethel, David May, Melinda Pilkinton, Zachary Henkel, Kristen Stives
Mississippi State University Mississippi State, Mississippi USA

For adults, the deleterious effect of misleading information on memory was ameliorated when a robot, rather than a human, presented misinformation in an interview (Bethel, Eakin, et al., 2013). Presumably, the robot did not elicit the same social demands that influenced memory as the human interviewer did. The present experiment extended those findings to children aged from 8 to 12 years. Children witnessed a slide show and misleading information was presented in an interview by either a robot or a human interviewer. Contrary to the adults, a memory test revealed a misinformation effect for both the robot and the human interviewer conditions. The findings demonstrate that, for children, social demands can be elicited by robots as well as by people.

**A-0524 When our mind wanders, where does it go? Retrospective bias induced by verbal cues**

Claudia Pelagatti [1], Igor Marchetti [2], Manila Vannucci [1]

[1] Department of NEUROFARBA - Section of Psychology, Florence, Italy; [2] Department of Experimental-Clinical and Health Psychology, Ghent, Belgium
Mind wandering (MW) occurs when our attention drifts away from the primary task towards mental contents, such as autobiographical memories (ABMs) and prospective thoughts, unrelated to the ongoing task. Although evidence for a prospective bias has been reported, new recent studies have shown that a number of variables may influence the temporal focus of MW. Here we systematically investigated the effects of task-irrelevant external stimulation, namely neutral verbal cues presented during a vigilance task, on the frequency of MW and its temporal focus. We found that verbal cues increased the frequency of MW during the task and induced a strong retrospective bias. Possible mechanisms involved in these effects and their implications for research on MW and ABMs are discussed.

**A-0525 High-resolution volumetric indices of hippocampal subregions and their association with autobiographical memory retrieval**
Daniela J. Palombo [1,2], Agnes Bacopulos [3], Robert S.C. Amaral [4], Rosanna K. Olsen [3,5], Rebecca M. Todd [6], Adam K. Anderson [7], Brian Levine [3,5]
[1] VA Boston Healthcare System Jamaica Plain, Boston, USA; [2] Boston University School of Medicine, Boston, USA; [3] Rotman Research Institute, Toronto, Canada; [4] McGill University, Montreal, Canada; [5] University of Toronto, Toronto, Canada; [6] University of British Columbia, Vancouver, Canada; [7] Cornell University, Ithaca, USA
The hippocampus is considered an important hub in the retrieval of autobiographical memories (AM). Yet, the precise contribution of this region remains unknown, particularly in relation to (1) how different hippocampal subregions may contribute to AM retrieval and (2) how their contributions may change over time. To address these issues, we scanned participants using high-resolution MRI and quantified hippocampal cornu ammonis (CA) subfields, dentate gyrus (DG), and the subiculum as well as medial temporal lobe cortices. We associated subregion volumes with the number of details generated for recent and remote AMs. Variability in both recent and remote AM retrieval was positively correlated with volume in subiculum and CA3/DG, but was unrelated to volume of CA1 or medial temporal lobe cortices.

**A-0529 Individual differences in thought control ability and item-method directed forgetting**
Tadashi Taga, Masanori Kobayashi, Jun Kawaguchi
Department of Psychology, Nagoya University, Aichi, Japan
To investigate the mechanisms underlying intentional forgetting, the present study examined the relationship between perceived thought control ability and item-method directed forgetting. Participants were presented with a face, followed by an instruction that asked them to either remember or forget the preceding face. In a test, participants took an old/new recognition test of faces. Finally, participants answered questionnaires regarding to perceived thought control ability (TCAQ) and mind wandering (MWQ). The results showed directed forgetting of faces: participants correctly recognized more faces with ‘remember’ instruction than faces with ‘forget’ one. We discuss the relationships between individual differences in thought control ability, such as TCAQ and MWQ, and the magnitude of item-method directed forgetting.

**A-0530 Exploring the relationship between empathy, compassion, and recognition memory performance for unfamiliar faces.**
Kyriaki Giannou, Karen Lander
The University of Manchester, Manchester, United Kingdom
Previous research suggests better recognition memory performance for unfamiliar faces is correlated with high empathy scores. Compassion has been proposed to be inclusive of empathy, perhaps underlying its importance in face recognition. We explored the relationship between empathy, compassion, self-compassion and recognition memory for unfamiliar faces. While results did not support the relationship between face recognition and empathy, or compassion for others, high levels of self-compassion, including its facets of mindfulness and common humanity, were related to better recognition. A second study investigated common humanity and mindfulness, independently from the self-compassion construct, in relation to recognition memory performance. Our findings support the role of mindfulness and common humanity in face recognition. Theoretical and practical implications of these findings are discussed.

**A-0533 Whom can I trust? Discrimination of social source reliability in a memory conformity paradigm**
Aleksandra Krogulska [1], Katarzyna Zawadzka [1,2], Maciej Hanczakowski [1,3]
[1] Jagiellonian University, Cracow, Poland; [2] Nottingham Trent University, UK; [3] Cardiff University, UK
Conforming to others in one’s memory judgments can increase accuracy of a memory report only when other’s responses are reliable. In three experiments we investigated whether people can assess reliability of two external social sources only on the basis of the cues provided by these sources and conform to the more reliable one. We used different types of recognition tests: single item recognition, source recognition, and associative recognition. Except for the first type of task, people conformed to a greater extent to the more reliable source, probably because only in these types of tests they were able to track long-term accuracy of source’s memory judgments by comparing them to the information in their own memory.

**A-0534 Spontaneous Activation of Event Details in Episodic Future Thinking**
Yuichi Ito [1], Jun Kawaguchi [2]
[1] Keio University, Tokyo, Japan; [2] Nagoya University, Nagoya, Japan
Previous studies suggest that future simulation is supported by both of retrieval and recombination of episodic details. However, it is unclear how individuals retrieve episodic details from memory to imagine “plausible” future events. People have to appropriately retrieve details of planned events during episodic simulation. We hypothesized that the details of future events that could be subsequently imagined got active in order to imagine plausible future scenarios. In the present study, activation of concepts of subsequent future event details (i.e., actions) was investigated by measuring reaction time. We found that each concept of the planned event was sequentially activated ahead of envisioning it. It suggests that the spontaneous activation of subsequent events supports imaging plausible future.

**A-0535 Neural activity during a subsequent memory task differentiates APOE-e4 carriers at young and mid age.**
Simon Evans[1], Fenella Prowse[2], Nicholas G Dowell[2], Naji Tabet[2], Sarah L King[1], Sam Hutton[1], Jennifer M Rusted[1]
[1]School of Psychology, University of Sussex, Brighton, UK; [2]Brighton and Sussex Medical School (BSMS), Brighton, UK
Carriers of the APOE e4 allele (e4+) have a significantly higher risk for age-related cognitive impairment. Previous imaging results in e4+ point to differences in hippocampal activity and connectivity; this is present in young adulthood suggesting that neural differences might preempt later cognitive decline. In this study we recruited young adult and mid-aged individuals, using fMRI to investigate neural activity during a subsequent memory task. We present evidence that e4+ show a specific pattern of hippocampal overrecruitment. Pupil diameter was also measured as an index of cognitive effort: young adult e4+ showed an impaired relationship between effort and performance. As the hippocampus is the primary site of AD pathology, e4+ overrecruitment at this site might reflect vulnerability to abnormal ageing.

**A-0537 Whole-brain connectivity during post-encoding rest predicts immediate and delayed memory retrieval for extended naturalistic film clips**

Buddhika Bellana [1,2], Tarek Amer [1,2], Melanie J. Sekeres [1,2], Morris Moscovitch [1,2], Cheryl L. Grady [1,2]
[1] University of Toronto, Canada; [2] Rotman Research Institute, Baycrest, Toronto, Canada

Functional connectivity (FC) during post-encoding rest has been shown to predict immediate memory retrieval performance for discrete stimuli, and this change in FC has been associated with rapid online consolidation processes. It follows that such processes should remain predictive of memory retrieval for extended film clips, and even after a long delay. To test this, we measured the effect of encoding on resting FC using a whole-brain pattern similarity approach to compare baseline and post-encoding rest conditions within subjects. Dissimilarity between baseline and post-encoding rest was positively correlated with recall of memory details at both the immediate and 7-day delay time points. These findings suggest the importance of post-encoding changes in resting FC, possibly reflecting consolidation processes.

**A-0543 Stimulus-specific similarity of neural activity at encoding and retrieval supports memory formation**

Lukas Kunz [1,2,3], Hui Zhang [3], Jürgen Fell [1], Nikolai Axmacher [1,2,3]
[1] University of Bonn, Bonn, Germany; [2] German Center for Neurodegenerative Diseases (DZNE), Bonn, Germany; [3] Ruhr-University Bochum, Bochum, Germany

The reinstatement hypothesis of memory retrieval postulates that stimulus-specific neural activity at encoding is reinstated during retrieval. In the present study, we investigated whether neural reinstatement occurs in the hippocampus using intracranial EEG from N = 11 epilepsy patients. During the experiment (Axmacher et al., Neuron, 2010), patients were asked to encode and retrieve series of unique faces and houses. Temporal representational similarity was calculated as the z-transformed Spearman-correlation between encoding and retrieval ERPs leading to stimulus-specific RSA-values. Preliminary analyses revealed that temporal RSA values were higher for subsequently remembered items as compared to subsequently forgotten items (p = .02). Hence, our results suggest that reinstatement of neural activity is a precondition for successful memory formation.

**A-0544 The benefits of actions at presentation and recall on following instructions in attention-deficit hyperactivity disorder (ADHD)**

Tian-xiao Yang[1], Richard J. Allen[2], Joni Holmes[3], Raymond C.K. Chan[1]
[1] Key Laboratory of Mental Health, Institute of Psychology, Chinese Academy of Sciences, Beijing, China [2] School of Psychology, University of Leeds, Leeds, UK [3] MRC Cognition & Brain Sciences Unit, 15 Chaucer Road, Cambridge, UK

This study investigated whether action-based presentation and recall format could enhance children's ability to following instructions. A total of 27 typically developing children and 24 children with ADHD between age 7 and 12 years old either listened to or viewed instructions, and then either verbally repeated or physically performed them. Children with ADHD were significantly impaired in all versions of the task. Both groups showed superior recall by enactment than oral repetition. Both groups showed benefit from physical demonstration compared to spoken instructions when the instructions were recalled verbally. These findings indicate that children with ADHD have deficits in following instructions but they can benefit from action-based presentation and recall to the similar extent as typically developing children.

**A-0547 The temporal dynamics of the involvement of rhinal and hippocampal structures in visual recognition memory**

Elodie Despouy [1,2,3], Martin Deudon [1,2], Jakub Kopal [1], Maxime Alloyer [1], Luc Valton [1,2], Jean-Christophe Sol [2], Jean-Albert Lotterie [2], Marie Denuelle [2], Emmanuel J. Barbeau [1]
[1] Centre de Recherche Cerveau et Cognition UMR5549, Toulouse, France ; [2] CHU Purpan, Toulouse, France ; [3] DIXI Medical, Besançon, France

Recognition memory principally involves the medial temporal lobes, most notably the perirhinal cortex and than the hippocampus. The rhinal cortex is activated earlier than the hippocampus, suggesting it should be involved in the earliest behavioural responses. However, this has never been demonstrated. We used intracerebral recordings in epileptic patients (n=9) while they performed the SAB (Speed and Accuracy Boosting procedure), a task based on high-speed constraints. Differential and decoding analyses enabled us to highlight an earlier (at least 100ms) involvement of the rhinal cortex. Furthermore, the fastest reaction times appeared to depend as predicted on the rhinal cortex, as the activity of the hippocampus occurred too late to account for the fastest responses.

**A-0549 ApoE4 in mild cognitive impairment prevents the activation of successful compensatory mechanisms during memory retrieval**

Laura Prieto del Val, Jose L. Cantero, Mercedes Atienza
Laboratory of Functional Neuroscience, CIBERNED (Network Center for Biomedical Research in Neurodegenerative Diseases), Pablo de Olavide University, Seville, Spain.

Evidence suggests that the presence of the apolipoprotein E (ApoE) ε4 allele exacerbates memory deficits in amnesic mild cognitive impairment (aMCI), likely due to their inability to rely on compensatory mechanisms. Here we evaluate this hypothesis by localizing EEG sources associated with memory retrieval. As expected, aMCI ε4 carriers showed lower memory scores than healthy older (HO) adults, whereas ε4 noncarriers showed similar performance as HO. Relative to aMCI, memory in HO was associated with enhanced theta power over left postcentral and inferior parietal lobe. However, memory in aMCI ε4 noncarriers relied more extensively on frontotemporal regions when compared with HO and aMCI ε4 carriers. These results indicate that the ε4 allele prevents neural compensation in aMCI.

**A-0556 EEG Correlates of Continuous Change Detection and Working Memory Capacity**

Daniel Labbé, Nikolai Axmacher
Ruhr-University Bochum, Germany

Working memory (WM) has a limited capacity, but it is still disputed whether this limit is best modeled as a fixed number of slots corresponding to discrete items or as a flexible continuous resource corresponding to a distributed representation. We investigated this question by comparing behavioral performance and EEG activity during two different versions of the change detection task (CDT) (Vogel & Machizawa, 2004). The classical CDT task indexes the quantity of WM representations and its effects on the contralateral delay activity (CDA), an event-related hemispheric difference wave for attended versus unattended stimuli. In the new task, we extend these findings to the continuous resource model.

**A-0562 Changing our automatisms: the effect of implicit and explicit processes**

Emese Szegedi-Hallgató [1] , Karolina Janacsek [2,3], Anna Bálint [1], Emőke Adrienn Hompoth [1,4], Leila Kerepes [1], Lia Tasi [1], Teodóra Vékony [1], Dezso Németh [2,3]
[1] University of Szeged, Institute of Psychology, Szeged, Hungary; [2] Eötvös Lóránd University, Institute of Psychology, Budapest, Hungary; [3]

Hungarian Academy of Sciences, Institute of Cognitive Neuroscience and Psychology, NAP-B Brain, Memory and Language Lab, Budapest, Hungary; [4] University of Szeged, Department of Obstetrics and Gynecology, Szeged, Hungary
The aim of our study was to assess the roles of the implicit and explicit memory systems in changing our automatisms. Participants had to learn a visomotor sequence on the first day of our Experiment, and a partially different sequence 24h later. The first group of participants learned both sequences implicitly; the second group learned the first sequence implicitly but they were informed about the sequence structure on the second day; the third group was informed about the sequence structure both days. We measured their knowledge about the transitional probabilities of the sequences (an aspect of the sequences that remained implicit irrespective of experimental condition). Our results indicate that explicit information about the automatisms helps us to rewire them.

**A-0566 Threat anticipation during encoding impairs visual object pattern separation**
Joseph E. Dunsmoor [1], Marijn CW Kroes [1], Stephen Braren [2], Elizabeth A. Phelps
[1] New York University, New York, NY, USA [2] Hunter College, New York, NY, USA
Effects of emotional arousal on memory consolidation are well established, but whether arousal affects the ability to discriminate between similar representations in memory is unclear. We tested the possibility that pattern separation is affected by aversive events while subjects view innocuous images. During an incidental encoding task, participants viewed 90 images surrounded by one of 3 colored borders that either signaled a high-intensity electrical shock to the wrist, a low-intensity electrical shock, or no shock (30 each). Pattern separation (the ability to discriminate between similar lure items) was tested 24-hours later and was impaired for items paired with a high-intensity electrical shock relative to low-intensity and no shock condition. Results have implications for understanding overgeneralization following highly emotional experiences.

**A-0568 Sleep enhances overgeneralisation only when there are few competitor memories**
Hikaru Tsujimura [1], Sonja Kotz [1,2], Alessandra Tafuro [3], Penny Lewis [1,4]
[1] University of Manchester, Manchester, United Kingdom; [2] Maastricht University, Maastricht, Netherlands; [3] University of Padova, Padova, Italy; [4] Cardiff University, Cardiff, United Kingdom
Sleep is important for memory consolidation, and has been linked to over-generalisation of memories. We investigated whether the presence of learned competitor memories would reduce this effect. We used facial stimuli morphed along two axes (young-to-old and masculine-to-feminine) creating a 2-dimensional array. Participants encoded a subset of these face-morphs, then performed a recognition memory test with both ‘old’ and ‘new’ morphs after an overnight-sleep or equivalent non-sleep delay. Importantly, ‘new’ morphs were sub-categorised according to whether they neighboured just one(N1) or three(N3) ‘old’ morphs in the 2D array. Results showed a sleep-related benefit for d’. Intriguingly, there were sleep-related increases in false alarms for N1 but not N3 morphs, suggesting that competitor memories reduced over-generalisation across sleep.

**A-0569 Are episodic memory differentially related to the effects of test-enhanced learning compared to group discussions?**
Carola Wiklund-Hörnqvist, Bert Jonsson, Tova Stenlund
Department of Psychology, Umeå University, Sweden
Despite compelling evidence for test-enhanced learning as superior compared to other pedagogical methods, less is known about how cognitive level affects performance. The beneficial effects has been ascribed to an episodic context account; in which subjects rely on the use of a temporal context while retrieving from memory. We examined individual differences in episodic memory in relation to different learning methods. Participants (n=103) were randomized to three groups: testing with feedback, group-discussion with or without feedback. The to-be-learned material was a chapter from a psychology textbook. Learning were assessed immediately, one and, at four weeks after initial learning. The testing-group performed best across time. A significant positive relationship between episodic memory and learning for both group-discussion groups, but not the testing-group.

**A-0570 Behavioral and Neurophysiological Perspectives on Lexical Decision-Primed False Memories**
Michael P. Toglia [1], Joseph Schmuller [1], Milena Korostenskaja [2], Eduardo M. Castillo [2], Natasha N. DeMeo [1]
[1] University of North Florida, Jacksonville, USA; [2] Florida Hospital for Children, Orlando, USA
In one form of the lexical decision task (LDT), participants determine on each trial whether or not two visually presented letter strings are words. Our approach involved using LDT trials to influence subsequent recognition performance on thematically-related DRM lists. Specifically, LDT trials that involve words semantically related to DRM lists promote false recognition of critical non-presented words. Thus, LDT can prime illusory recollections that rival or exceed levels observed in control conditions. In addition to these behavioral data we will present preliminary findings of a corresponding magnetoencephalography (MEG) study. Accordingly, we will discuss results in terms of theories that account for false memory with references to its neurophysiological substrates.

**A-0571 Interviewing to detect deception: The effect of Model Statements emphasising spatial and temporal details for eliciting veracity cues**
Cody Porter, Aldert Vrij, Sharon Leal, Zarah Vernham
University of Portsmouth (UoP), Department of Psychology
Eliciting information from witnesses is a vital part of interviewing. However, witnesses rarely provide enough information. Hearing an audio-recorded Model Statement (MS) acts as an example for the amount of detail expected, and previous research has shown that it increases the number of details provided for both truth tellers and liars. In the current study, participants either completed or had to pretend to complete a task. Participants were then assigned to either a free recall condition (control), or one of three MS conditions: spatial, temporal, or the two combined. The total number of words was greater in all MS conditions compared to the control condition. Truth tellers are also expected to provide more plausible details than liars.

**A-0573 Random order reconstruction: a novel order memory task appropriate for cross-modal comparison**
Andrew J. Johnson, Rachel Skinner, Christopher Miles
Department of Psychology, Bournemouth University, UK
We describe a novel order memory task that is applicable for cross-modal comparisons. In the random order reconstruction (ROR) procedure, participants are presented a sequence of items followed, at test, by the sequential re-presentation of the list items in a randomised order. At test, participants are required to state the position of each list item. Experiment 1 demonstrated that across a range of list lengths (3-10), ROR produces primacy but not recency. When accuracy was plotted as a function of test order, there was an advantage for the last recalled item. Experiment 2 directly compared ROR and serial order reconstruction and replicated the absence of recency for ROR. Experiment 3 showed that ROR can produce Hebb repetition learning.

**A-0574 Oscillatory entrainment in episodic memory consolidation**

Maria Carmen Martín-Buro [1,2], Maria Wimber [3], Richard N Henson [4], Bernhard P Staresina [3]
[1] Laboratory of Cognitive and Computational Neuroscience (UCM-UPM), Center for Biomedical Technology, Madrid, Spain; [2] Department of Basic Psychology II, Complutense University of Madrid, Madrid, Spain; [3] University of Birmingham, School of Psychology, Birmingham, UK; [4] MRC Cognition & Brain Sciences Unit, Cambridge, UK

Consolidation processes transform recently acquired experiences into durable memory traces. The neuronal mechanisms thought to underlie consolidation consist of hippocampal reactivation and hippocampal-neocortical interactions during post-learning sleep or wakeful resting. In this study, we used magnetoencephalography (MEG) to investigate consolidation during waking rest in an episodic memory paradigm. Participants studied word pairs under deep or shallow encoding conditions, presented on flickering backgrounds to entrain a steady-state brain response at either 8.6 or 12 Hz. We found a significant power increase in the entrainment frequencies during encoding, particularly in posterior areas. Subsequent analyses will examine the re-emergence of these frequencies during rest periods and its relation to memory performance.

**A-0575 Familiarity with spatial context precludes the encoding of novel information**

Iva K. Brunec [1,2], Morgan D. Barense [1,2], Morris Moscovitch [1,2]
[1] Department of Psychology, University of Toronto, Canada [2] Rotman Research Institute, Baycrest Health Sciences, Toronto, Canada

With repeated exposure to an environment, spatial memory becomes schematized and relies increasingly less on the hippocampus (Hirshhorn et al, 2012, Hippocampus), suggesting novel episodic encoding in familiar contexts may also be altered. We investigated how event duration is encoded in familiar spatial contexts. Participants virtually navigated a familiar route in Toronto and waited for different durations at intersections. We found that greater familiarity with the city was negatively predictive of temporal discrimination ability but positively related to temporal order memory. This difference persisted even when attentional factors were controlled. We propose that novel event-unique information is less efficiently encoded due to (1) proactive interference from existing episodic representations, and/or (2) hippocampal disengagement resulting from contextual familiarity.

**A-0576 Between-Stream Similarity Under Free Recall in a Proactive Interference Paradigm.**

Madeleine Arber [1], Gerald Tehan [1], Georgina Anne Tolan [2]
[1] University of Southern Queensland; [2] Australian Catholic University

When a small number of items are studied for recall against a background of unattended irrelevant speech, between-stream similarity effects are readily observed in short-term cued recall but not under serial recall. The current experiments examine between-stream effects in free recall where proactive interference (PI) was manipulated. Participants completed a free recall task under quiet or irrelevant speech conditions. Under quite conditions, PI effects were present. Under irrelevant speech, no PI effects were present on target recall; however between-stream similarity was apparent as target and foil recall increased when the speech supported the critical items under their respective conditions. These findings have implications for understanding the similarities and differences between free and serial recall of short lists.

**A-0580 Influence of test format and test format combination on testing effect: Not test produces better retention.**

Daisuke CHO
Hosei university, Tokyo, Japan

Many studies have demonstrated the testing effect that testing has a powerful effect on the retention. The present research investigated whether an immediate test also produced better retention. In the studying/testing phase, participants took two studying sessions, two tests in the same format, or two tests in different formats. In the final testing phase, participants took immediate and/or delayed free recall tests. Results indicated that using the same format produced poor retention, but if participants took an immediate free recall test, this suppressed forgetting. Meanwhile, combining different formats produced better retention even without immediate recall. These results suggest that testing does not always produce better retention and it depends on how a memory trace was enhanced by testing.

**A-0583 Externalizing mental context reinstatement with closed-loop neurofeedback to support memory retrieval**

Megan T. deBettencourt [1], Nicholas B. Turk-Browne [1,2], Kenneth A. Norman [1,2]
[1] Princeton Neuroscience Institute, Princeton University, Princeton, NJ [2] Department of Psychology, Princeton University, Princeton, NJ

Reinstating contextual information during memory retrieval benefits recall performance. We investigated the dynamics of this context reinstatement process with closed-loop neurofeedback from real-time fMRI. In two experiments, participants studied and recalled lists of words presented in a context of face or scene images. Prior to recall, a list context was cued, and then we provided participants with feedback based on real-time evidence from a multivariate pattern classifier for the cued vs. uncued category. In Experiment 1, the degree to which the correct context was reinstated using neurofeedback predicted the number of words recalled from the cued list. In Experiment 2, we compared context reinstatement with and without neurofeedback and found that neural activity and behavior were coupled only during neurofeedback.

**A-0584 Investigating the determinants of the frequency effect in serial recall: A meta-analysis**

Leonie M. Miller, Steven Roodenrys
University of Wollongong, Australia

The ubiquity of a frequency effect in the short-term serial recall of pure lists is not in question; a robust advantage for high-frequency words is reliably observed. The effect has been primarily attributed to differences in the pre-existing knowledge of the items, although other factors, for example differences in articulation or co-articulation of items have been argued to make contributions to its size. Nonetheless, the serial recall task has many parameters that can be varied across different operationalisations. It is plausible that these factors could also influence heterogeneity in observed results. Using meta-analysis, the present study quantifies the factors that modulate the frequency effect in pure lists. Predictions from theoretical positions are compared against findings to test explanatory capacity.

**A-0585 The intricacy of interference in verbal short-term memory**

Steven Roodenrys, Sophie Scott, Leonie Miller
University of Wollongong, Wollongong, Australia

It is widely assumed that items in verbal short-term memory interfere with one another, yet, to our knowledge, no studies have reported examining the details of how words within lists interfere with each other by isolating the effect of specific items. We report two experiments in which participants recalled lists containing CVC words in which a target word shared each of its three phonemes with one of the other words, and control lists with no overlap. In one experiment the target word preceded the overlapping words while in the other experiment it followed the overlapping words. The results show greater interference when the vowel is shared than when consonants are shared, and greater proactive than retroactive interference.

**A-0587 Metacognition that a cognitive task makes a following recognition task difficult causes the revelation effect**
Hiroshi Miura, Yuji Itoh
Keio University, Tokyo, Japan
Performing a cognitive task prior to making a recognition judgment increases the probability of old responses. This is known as the revelation effect. To determine its mechanism, we examined the following hypothesis: when people have the metacognition that a cognitive task makes a following recognition task difficult, they adopt a more liberal criterion, and the revelation effect occurs. Ninety students, who underwent word recognition tests in the former block, were divided into three groups based on the difficulty of word recognition judgments preceded by a cognitive task: easy, control, and difficult. Trend analysis in the latter block showed that the revelation effect monotonically increased as a function of word difficulty. Thus, the results supported our hypothesis.

**A-0588 Can providing a DON'T KNOW option reduce the influence of a suggestive interviewer? : A comparison of repeated identification procedures between show-up and simultaneous lineup.**
Yui Fukushima [1], Yukio Itsukushima [2]
[1] The Institute of Humanities and Social Sciences, Nihon University, Tokyo, Japan [2] College of Humanities and Sciences, Nihon University, Tokyo, Japan
Does providing an explicit DON'T KNOW option reduce the influence of a suggestive interviewer on the performance of eyewitnesses in the repeated identification procedures? Seventy-five participants to a filmed mock crime event were interviewed twice. Each interview included target-absent show-up or lineup identification procedure. In both procedures, a suggestive interviewer or non –suggestive interviewer was also included. Results showed that there was no significant difference between the accuracy of identification of the suggestive condition and that of the non-suggestive condition. However, the participants in the lineup condition are less likely to say "not there" than those in the show-up condition. This indicates the superiority of the absolute judgment in the show-up to the relative judgment in the simultaneous lineup

**A-0590 Discrete networks underlie learning to recognise conscious and non-conscious sequences of events**
Clive R. Rosenthal [1], Samantha R. Andrews [2], Thomas D. Miller [1], Christopher Kennard [1], David Soto [2,3]
[1] Nuffield Department of Clinical Neurosciences, University of Oxford, Oxford, UK; [2] Department of Experimental Psychology, University of Oxford, Oxford, UK; [3] Basque Center on Cognition, Brain and Language, San Sebastian, Spain; and, [4] Ikerbasque, Basque Foundation for Science, Bilbao, Spain
Learning is modulated by the availability of visual awareness. fMRI was used to investigate learning to recognise conscious (visible) and non-conscious (masked from visual awareness) visuospatial sequences. Learning the conscious sequence was associated with a right fronto-parietal network and foci in thalamus and putamen, whereas recognition memory was associated with precuneus and supramarginal gyrus activity. Learning the non-conscious sequence was associated V1 activity, as part of a temporo-occipital and basal ganglia network. Non-conscious recognition memory was associated with coupling between V1 and the hippocampus. Only V1 responses predicted recognition memory for the non-conscious sequence. In comparing conscious and non-conscious learning, overlapping activity was confined to the putamen. The role of visual awareness in sequence learning and recognition memory is discussed.

**A-0595 Response activation by repetition priming: An LRP study**
Christian Valt [1], Birgit Stürmer [1], Werner Sommer [2], Stephan Boehm [3]
[1] International Psychoanalytic University, Berlin, Germany; [2] Humboldt University, Berlin, Germany; [3] Bangor University, UK
According to recent interpretations of repetition priming, responses are automatically bound to a stimulus and reactivated during successive presentations of the stimulus, hence, affecting its current processing. The present experiment aims to directly test whether, and when, stimulus-response bindings are reactivated in repetition priming. The lateralized readiness potential (LRP) was analysed for primed faces to investigate potential response retrieval. Congruent and incongruent responses were obtained by having identical or reversed tasks between study and test. Primed stimuli presented LRP activation with opposite polarity for the two congruency conditions in the time-window 250-300 ms, indicating correct and incorrect response activation for congruent and incongruent trials, respectively. We take this result as direct evidence for the rapid response learning assumption.

**A-0650 Age differences in representational specificity and cortical reinstatement during episodic memory: A multivariate fMRI investigation**
Alexandra N Trelle [1], Jon S Simons [1], Richard N Henson [2]
[1] University of Cambridge; [2] MRC Cognition & Brain Sciences Unit
Using fMRI, we explored the contribution of neural dedifferentiation to age differences in episodic memory. Participants studied word-picture pairs and memory was assessed using a recombined recognition test. Pattern similarity analysis revealed an age-related reduction in the distinctiveness of stimulus representations during encoding. During retrieval, event-specific reinstatement of encoding-related activity was identified during hits and correct rejections in younger, but not older, adults. Instead, older adults displayed reduced similarity between corresponding encoding and retrieval patterns during correct rejections, perhaps reflecting cue-related imagery, which was associated with a lower false alarm rate across older adults. These findings suggest that older adults may compensate for declines in representational specificity by relying on retrieval strategies that favour familiarity over recall-to-reject processes.

**A-0651 Predictors of the long-term retention of a unique experience in young children**
Ineke Wessel, Josephien Jansen, Sophie Lammertink, Eline Nanninga
University of Groningen, The Netherlands
We explored the predictive value of age, language ability and rehearsal for performance on various indices of long-term (episodic) memory in early childhood. Preschoolers engaged in a unique treasure-hunt experience. One year later, we tested recall, pictorial recognition and temporal ordering of event-related photographs. Relative to four-year-olds, five-year-olds performed better with respect to recall and temporal ordering, but not recognition. Rehearsal was associated with better recall and temporal ordering. Interestingly, poorer language ability at the time of the initial experience was related to better recognition. Perhaps a more perceptual type of processing at encoding especially benefits performance on tests reinstating the physical aspects of an experience, whereas post-event rehearsal keeps a memory alive in a more narrative form.

**A-0652 Consolidating new semantic information during word learning: does prior knowledge help?**
Emma James, Lisa Henderson, Gareth Gaskell

Department of Psychology, University of York, UK
Converging evidence suggests that newly learned words are strengthened and integrated off-line; however, less is known about the variables that influence consolidation. One view, examined here, is that new information is more readily integrated if it is consistent with prior knowledge (Lewis & Durrant, 2011). Participants are trained on 24 novel words with definitions linked to dense or sparse semantic neighbourhoods, and tested on their acquired knowledge on the same day and after 24 hours and 1 week. Performance on a speeded semantic categorisation task will address whether new words adopt the lexical processing characteristics of their neighbours (Grondin et al., 2009); cued recall and definition tasks will index explicit knowledge. Implications for memory consolidation theories will be considered.

**A-0655 Spontaneous recognition: Underlying neural mechanisms and the role of confidence.**
Fatma Ebru Ates, Dinkar Sharma, Zara Bergstrom
University of Kent, Canterbury, UK.
Intentional recognition judgements to a target stimulus can be biased by spontaneous, unintentional recognition of familiar but task-irrelevant distractors. We investigated the underlying neural processes of such biases using EEG, focusing on how behavioural and EEG markers of bias correlate with participants' confidence in their recognition judgements. Preliminary results suggest that spontaneous recognition of distractors elicited an early frontal-central positivity that has been linked with a relatively automatic familiarity process, whilst intentional target recognition also produced a later left-parietal positivity that reflects recollection. This latter ERP effect was particularly modulated by recognition confidence. The findings suggest dissociable neurocognitive processes contribute to unintentional and intentional recognition.

**A-0656 Slow rTMS over left DLPFC unexpectedly enhances memory encoding**
Verena Braun, Simon Hanslmayr
School of Psychology, University of Birmingham, Birmingham, United Kingdom
The left dorso-lateral prefrontal cortex (DLPFC) is presumably involved in episodic memory formation. Surprisingly, in a simultaneous EEG-TMS experiment, we found that slow rTMS over the left DLPFC boosts memory encoding. 32 healthy human participants engaged in a list learning paradigm while receiving 1Hz rTMS either to the left DLPFC or Vertex (control site). Compared to Vertex stimulation, left DLPFC stimulation increased memory performance and induced higher pre-stimulus power in the beta frequency range. These results suggest that slow rTMS inhibits the DLPFC, as indexed by an increase in beta power. Such inhibition may have beneficial effects on episodic memory encoding via disrupting rehearsal, which might be disadvantageous for encoding of long-term memories. Keywords: episodic memory, oscillations, TMS, EEG, inhibition

**A-0659 False memories in schizophrenia patients. The comparison of different memory distortion paradigms**
Joanna Ulatowska, Maryla Sawicka
Institute of Applied Psychology, Maria Grzegorzewska University, Warsaw, Poland
Previous studies investigating false memories in schizophrenia patients have revealed mixed results, suggesting that such patients either tend to be more prone to memory distortion or showing no such effect. This inconsistency could stem from different paradigms utilized to induce memory errors. To test this hypothesis, the present study applied two commonly used false memory procedures – the DRM paradigm, testing associative memory errors, and misinformation paradigm, investigating susceptibility to misleading post-event information. The memory performance of schizophrenia patients was compared to demographically matched healthy controls and to patients with alcohol addiction. This experiment could also help to clarify whether the misinformation and DRM false memories involve similar memory mechanisms. The results are discussed in terms of source monitoring framework.

**A-0667 Effect of test placement on learning of educational materials**
Oyku Uner, Henry L. Roediger III
Washington University in St. Louis, St. Louis, US
Retrieval practice enhances learning of paired-associates and short passages, but it is not clear how it should be implemented for authentic educational materials, such as textbook chapters. In the current experiment, students studied a 40-page textbook chapter on biology. Retrieval practice with correct-answer feedback was manipulated within-subjects: Some questions appeared only after a chapter section, others only after the whole chapter, and yet others after both a section and the whole chapter. Two groups served as controls: One group studied the feedback presented in the retrieval practice condition, and the other group simply read the chapter. Students took a final test two days later. The results illuminate whether students should practice retrieval intermittently or after they finish their reading.

**A-0668 Effect of confidence scale type on confidence-accuracy relationship**
Eylul Tekin, Henry L. Roediger III
Washington University in St. Louis, St. Louis, US
The confidence scales used in memory research range from 2-points to 100-points, with the assumption that they yield similar results. In two experiments, we directly compared confidence scales of 4-, 5-, 20- and 100-points in assessing confidence-accuracy plots for related words (Experiment 1) and face sets (Experiment 2). We divided 100- and 20-point scales into bins of either 4 or 5, plotted confidence-accuracy calibration plots for hit rates and false alarms, and compared them to the 4- and 5- point scales. The results suggest that the type of confidence scale used has negligible impact on the confidence-accuracy relationship, and that the scales are convertible to one another. Choice of scale range is probably not having an effect on memory research.

**A-0670 Remembering faces you don't trust: Brain potentials during encoding and recognition**
Mathias Weymar, Martin Junge, Alfons O. Hamm, Alexander Lischke
Institute of Psychology, University of Greifswald, Greifswald, Germany
In daily life, we automatically form impressions of other people. In the present ERP study we investigated whether the perceived trustworthiness of faces affects later recognition memory. Participants viewed 60 neutral faces, rated high and low in trustworthiness, and immediately after, performed a recognition memory task, in which the same old faces and 60 new faces were presented. At encoding, untrustworthy, compared to trustworthy, faces prompted an enhanced parietal positivity (500-800 ms). At test, untrustworthy faces were better remembered than trustworthy faces, associated with enhanced ERP old/new differences over occipital (160–200 ms) and frontal regions (500–700 ms). Taken together, our data indicate enhanced memory for unstrustworthy faces, which might result from heightened attention and deeper processing at encoding.

**A-0671 Sleep-mediated memory consolidation depends on the level of integration at encoding**
Lea Himmer, Steffen Gais, Monika Schönauer

Institute of Medical Psychology and Behavioral Neurobiology, Eberhard Karls Universität, Tübingen, Germany
Sleep facilitates declarative memory consolidation, an effect supposed to rely on the integration of new memories into neocortical networks. Here, we test whether sleep affects memory for word-picture associations differently when they were learned explicitly or using fast mapping (FM). FM allows neocortical integration already during encoding and should therefore benefit less from sleep. We find that sleep has a protective effect on explicitly learned associations, which increases with sleep duration. In contrast, memory for associations learned by FM remains stable regardless of whether sleep or wakefulness follows learning. Our results indicate that the need for sleep-mediated memory consolidation depends on the level of integration during encoding, revealing neocortical integration as an essential function of consolidation processes during sleep.

**A-0672 Exploring the equivalence of the paper-and-pencil and the web-based version of the Prospective and Retrospective Memory Questionnaire**

Diana R. Pereira [1], Pedro B. Albuquerque [2]
[1] Neuropsychophysiology Lab, CIPsi, School of Psychology, University of Minho, Braga, Portugal [2] Human Cognition Lab, CIPsi, School of Psychology, University of Minho, Braga, Portugal
Subjective memory complaints are commonly assessed by using self-report measures such as the Prospective and Retrospective Memory Questionnaire (PRMQ; Smith, Della Sala, Logie, & Maylor, 2000), which is one of the most widely used instruments. In this context, the purposes of this study were to present a preliminary adaptation of the PRMQ to European Portuguese and, concomitantly, to test the equivalence between the paper-and-pencil (N = 85) and the online version (N = 1054) of the PRMQ in a sample of healthy young and middle-age participants. The results suggested the nonequivalence between both versions regarding the factorial structure, underscoring the idea that it is relevant to consider both traditional and internet-based approaches when exploring the psychometric properties of self-rating measures.

**A-0674 Do you know what you don't know? 'Don't know' responding to answerable and unanswerable questions.**

Aleksandra Krogulska [1], Zuzanna Skóra [1], Alan Scoboria [2], Maciej Hanczakowski [1,3], Katarzyna Zawadzka [1,4]
[1] Jagiellonian University, Poland; [2] University of Windsor, Canada; [3] Cardiff University, UK; [4] Nottingham Trent University, UK
Unanswerable questions that cannot be answered on the basis of one's memory and to which 'don't know' is a correct response are common in everyday life, but are rarely investigated in memory research. Here we compared the effects of two manipulations on answerable and unanswerable questions in an eyewitness-related memory test. The provision of warning about the presence of unanswerable questions increased the accuracy of responses to these questions without impairing the accuracy of responses to answerable questions. Re-presenting at test a context first encountered at study, on the other hand, decreased 'don't know' responding to answerable and unanswerable questions alike, thus decreasing accuracy for unanswerable questions.

**A-0677 Source memory for DRM-paradigm illusion in face-to-face interaction**

Valeria A. Gershkovich, Matvey I. Nelubov
Saint Petersburg State University, Saint Petersburg, Russia
Memory attributions in case of false memories were studied. The experiment consisted of learning and testing stages. At learning stage DRM illusion was evoked. Participants were to remember associatively organized words, pronounced by turns with the partner. At testing stage, which took place either immediately or in a week, previously seen words, lures and fillers were presented. Source-monitoring paradigm was used (attribution to "mine" vs "partner's" vs not presented). Results indicated that DRM illusion was evoked in both cases. People tend to attribute previously presented words and lures to themselves or partners quite equally, and reject fillers, but in a week there appeared tendency to attribute those stimuli to themselves rather than to partner. Supported by RFH grant # 16-06-00858

**A-0681 The effect of social context on implicit sequence learning**

Katinka Dobrotka [1], Ivett Podina [1], Karolina Janacsek [1,2], Dezso Nemeth [1,2]
[1] Institute of Psychology, Eötvös Loránd University, Budapest, Hungary [2] MTA-ELTE NAP B Brain, Memory and Language Research Group, Institute of Cognitive Neuroscience and Psychology, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary
The social context can influence our actions and cognitive processes. The relationship between learning/memory processes and social context has not been investigated yet. Our study aims to fill this gap by investigating how the presence of another person influences implicit sequence learning. We used the Alternating Serial Reaction Time task to measure learning. Testing was divided into two sessions (with 24-hour delay); two participants took place in the social condition and one participant in the control condition. Our results show that social context did not influence implicit sequence learning performance in the first session but led to better consolidation after the 24-hour delay. These findings suggest an interaction between non-declarative memory consolidation and the presence of others.

**A-0684 The brain systems underpinning cross-situational learning**

Sam Berens, Jessica Horst, Chris Bird
School of Psychology, University of Sussex, UK
Infants are able to rapidly acquire new linguistic associations (e.g. nouns) despite an underdeveloped hippocampal system. We hypothesised that a method of statistical learning implicated in language development (cross-situational learning; xSL) may be principally dependent on neocortical learning mechanisms rather than the hippocampus. During fMRI, participants learnt novel word-object associations as trained via xSL. Cortical areas associated with semantic processing, attention, and reasoning exhibited activation increases that correlated with the amount of learning taking place. A PPI analysis demonstrated that learning coincided with increased functional connectivity between speech processing areas (BA22) and the left temporal pole. There was no evidence that the hippocampus was involved in learning. These results suggest that the semantic memory system is directly engaged in xSL.

**A-0686 Guess and knowledge through confidence testing in a multiple-choice memory test**

Malen Migueles, Elvira García-Bajos, Alaitz Aizpurua
University of the Basque Country UPV/EHU, Donostia-San Sebastián, Spain
We examined whether students are capable of estimating accuracy on a multiple-choice test based on response-confidence values. The last day of memory course participants had a mock exam. They were first encouraged to answer the questions they knew, then the questions they thought were correct (guess), and finally to respond to the questions which they would not answer in an exam (blank). Accuracy scores showed that sure choices accounted for seventy-five per cent of the exam score, guessing answers for twenty per cent, and blank answers less than five per cent. Confidence ratings predicted memory accuracy on each of the successive decision making phases. Encouraging metacognitive-monitoring thorough response-confidence can have important benefits for student learning.

**A-0687 Memory for end-of-life support preferences**

Elvira García-Bajos, Malen Migueles
University of the Basque Country UPV/EHU, Donostia-San Sebastián, Spain

We studied people prospective memory for end-of-life decisions. Psychology students were administered the Life Support Preferences Questionnaire to assess life-support choices, which describes six medical scenarios with different prognoses and care preferences. Recall, recognition, accuracy, response criteria, confidence and response stability were assessed immediately and at four weeks. Correct recall decreased and source or commission errors increased from immediate to long-term recall. In the recognition task there were no differences between hits and false alarms, showing the difficulty in discriminating between true and false contents. Hits decreased and false alarms increased in the long-term recognition. Long-term memory was quite poor and biased, but Life Support Preferences did not change much.

**A-0688 Word orientation as a new candidate for list composition effects in free recall**

Victor W. Sungkhasettee, Henry L. Roediger III
Washington University in St. Louis, St. Louis, Missouri, United States of America

The issue of using pure or mixed lists often has a large effect on outcomes in free recall, with great effects in mixed lists that disappear in pure lists. This study examined whether the memory advantage obtained by Sungkhasettee, Friedman, and Castel (2011) manipulating word orientation in mixed lists is also subject to the aforementioned limitation. Subjects studied words in either a pure-list design where the words are presented either upright or rotated upside-down, or in a mixed-list design where half the words are presented upright and the other half are rotated upside-down. Results show a memory advantage in the mixed-list design that disappear in the pure-list design, and accounts of the pure/mixed list problem are explored.

**A-0689 Predicting span in Alzheimer's disease**

Julie Bertrand[1], Chris Moulin[2], Olivier Rouaud[3], Sophie Guillemin[3], Céline Souchay[2], Yannick Béjot [1,3]
Unité de recherche EA4184, Centre d'épidémiologie de populations et de santé publique de Bourgogne, France (CEP) [1] Laboratoire de Psychologie et NeuroCognition, LPNC UMR CNRS 5105, Université de Grenoble Alpes, France [2] Centre Mémoire Ressources et Recherche (CMRR), Hôpital François Mitterrand, Dijon, France [3]

A fractionation of metamemory, the ability to predict one's own memory performance has been found in Alzheimer's disease. However, so far the literature has mainly focused on long-term memory tasks. In the present study, Alzheimer's patients were asked to predict their span, both forwards and backwards. Thirty young adults, 30 older adults and 27 Alzheimer's disease patients were included. Patients were asked to predict their performance both before and after the span task. Furthermore, two types of predictions were used: a global prediction on the entire list and an item per item prediction. The results showed that despite having a lower memory performance compared to controls, patient with Alzheimer's disease could accurately predict their performance.

**A-0699 Tactile Ranschburg effects: facilitation and inhibitory repetition effects analogous to verbal memory**

Daisy Roe, Andrew J. Johnson
Department of Psychology, Bournemouth University, UK

Two experiments examined the effect of within-sequence item repetitions in tactile order memory. Employing an immediate serial recall (ISR) procedure, participants reconstructed a 6-item sequence tapped upon their fingers by moving those fingers in the order of original stimulation. In Experiment 1, within-sequence repetition of an item separated by 2-intervening items resulted in a significant reduction in recall accuracy for that repeated item (i.e. the Ranschburg effect). In Experiment 2, within-sequence repetition of an adjacent item resulted in significant recall facilitation for that repeated item. These effects mirror those reported for verbal stimuli (e.g. Henson, 1998). These data are the first to demonstrate the Ranschburg effect with tactile stimuli and suggest further cross-modal similarities in order memory.

**A-0705 Language use modulates relational semantic processing**

Eugenia Marin-Garcia, Pedro M. Paz-Alonso
Basque Center on Cognition, Brain and Language (BCBL)

Interactions between semantic and episodic memory as function of language-related factors remain poorly understood. Here, we used the Deese-Roediger-McDermott paradigm to investigate semantic relational processing leading to veridical and false memories in monolinguals and early bilinguals. Results revealed that monolinguals exhibited more false memories, but similar true memories, relative to bilinguals. To examine if this difference was due to the fact of being monolingual/bilingual or to a differential language use in daily life, we compared high vs. low language-use bilinguals with monolinguals. Importantly, monolinguals and high language-use bilinguals showed similar false memory rates, and higher false memories relative to low language-use bilinguals. These results suggest that language-use modulates relational semantic processing probably by facilitating the access to semantic representations.

**A-0708 Prior Knowledge Effects on Memory: Are there Age-Related Differences?**

Garvin Brod [1], Yee Lee Shing [1,2]
[1] Max Planck Institute for Human Development [2] University of Stirling

The congruency effect (i.e. better memory for schema-congruent than schema-incongruent information) can be interpreted as an estimate of the influence that prior knowledge exerts on memory processing. The ventromedial prefrontal cortex is shown to mediate this influence in young adults, but whether it serves a similar role across the lifespan is unknown. We compared 24 first-grade children (aged 6–7), 24 younger adults (aged 18), and 29 older adults (aged 68–75) on an fMRI memory task consisting of object-scene stimuli pairs that varied in congruency. We hypothesized and found that older adults displayed the strongest associative memory congruency effect, whereas it was comparable in size between children and younger adults. Corresponding fMRI data will be presented.

**A-0710 CA3 lesion-mediated episodic amnesia impairs recognition memory for non-spatial discontinuous associations**

Thomas D. Miller [1,2], Trevor T.-J. Chong [3], Anne M. Aimola Davies [4], Michael R. Johnson [5], Sarosh R. Irani [1], Christopher Kennard [1], Penny A. Gowland [6], Clive R. Rosenthal [1]
[1] Department of Clinical Neurosciences, University of Oxford, Oxford, UK; [2] National Hospital for Neurology and Neurosurgery, London; [3] Department of Psychology, Macquarie University, Sydney, Australia; [4] Department of Experimental Psychology, University of Oxford, Oxford, UK; [5] Division of Brain Sciences, Imperial College London, London, UK; and, [6] University of Nottingham, Nottingham, UK

The causal role of human hippocampal subfields in recognition memory is poorly understood. Here, we examined item-specific and relational

recognition memory in 10 patients with bilateral CA3 lesion-mediated episodic amnesia and in 20 control participants. Four experiments were conducted to assess recognition memory for (1) non-spatial item-specific information, (2) spatial item-specific information, (3) non-spatial serial associations, and (4) spatial serial associations. Both relational recognition memory tests were based on discontinuous second-order conditional serial associations. Results indicate that the patients performed similarly to healthy controls, with the exception of impaired relational recognition memory for non-spatial discontinuous associations. The implications are discussed in terms of medial-temporal lobe based neurobiological accounts of recognition memory.

**A-0713 Time-based prospective memory in Parkinson's disease mild cognitive impairment with and without medication**

Ondrej Bezdicek [1], Mareike Altgassen [2,3], Jan Roth [1], Filip Růžička [1], Evžen Růžička [1], Robert Jech [1]
[1] Department of Neurology and Centre of Clinical Neuroscience, Charles University in Prague, First Faculty of Medicine and General University Hospital in Prague, Czech Republic [2] Radboud University Nijmegen, The Netherlands [3] Technische Universitaet Dresden, Germany

Empirical evidence on the effects of L-Dopa medication on time-based prospective memory in Parkinson's disease with mild cognitive impairment (PD-MCI) is scarce. Thirty-seven controls (62.4±(SD)6.8 years) and 34 PD patients (64.7±6.9 years) performed a time-based PM task which was embedded in a visuo-spatial working memory task (ongoing task). PD patients were assessed on and off medication. In the number of TBPM hits PD patients neither differ in their ON and OFF state (p=0.20), nor PD in ON from controls (p=0.71). PD-MCI neither differ from PD (p=0.09), nor from controls (0.16) in ON. TBPM is not significantly worsening in the OFF medication state. TBPM is not impaired in PD-MCI.

**A-0718 Accelerated forgetting following acute chemotherapy treatment**

Oana C. Lindner, Andrew Mayes, Martin G. McCabe, Deborah Talmi
University of Manchester; The Christie NHS Foundation Trust

This is the first study investigating the acute effects of cancer treatment on memory. We asked whether 24-hour consolidation becomes disrupted in a group of newly-diagnosed cancer patients, while separating it from encoding and retrieval processes. We tested 10 newly diagnosed cancer patients with non-brain malignancies immediately before, and 24 hours, after their first cancer treatment. They were matched to 10 healthy controls. Participants were administered a list learning task modelled on the Rey Auditory Verbal Learning Test. Following treatment and compared to controls, patients exhibited a faster forgetting rate, after adjusting for minor learning performance differences. We conclude that drugs included in the first cancer treatment may therefore provide a novel, interesting method to explore memory consolidation in humans.

**A-0719 Musical mood induction procedure on working memory performance: Does Valence matter?**

Fabiana Silva Ribeiro, Pedro B. Albuquerque, Flávia Heloísa Santos
Laboratory of Human Cognition, University of Minho,Braga, Portugal

Effects of emotion on working memory (WM) are controversial. Besides, the influence of valenced musical mood induction procedure on WM remains largely unclear. The present study had a between-group design to investigate the impact of mood induction by music of with positive and negative valences on subsequent verbal and visuospatial WM performance. Groups were formed by 49 undergraduate students divided in three conditions: positive valence (n=15), negative valence (n=17) and no-induction (n=17). Preliminary results demonstrated that negative and positive valenced music work as mood inductors, since produced a decrease on complex span performance in contrast with no-induction group. Furthermore, these results indicate that the emotional influence of musical mood induction on WM is modality specific affecting only visuospatial capacity.

**A-0889 Predicting recognition – The asymmetric relationship between predictions and recognition experiences**

Marina P Gross, Ian G Dobbins
Washington University in St. Louis, St. Louis, MO, U.S.A

Although most memory models assume trial independence, recent research suggests recognition judgments may demonstrate positive serial dependencies: OLD judgments are more likely to follow prior OLD than NEW judgments. We tested whether explicit expectations moderate such dependencies by asking participants to predict upcoming memory probes. Individual participants' predictions were either negatively or positively related to their immediately preceding recognition response, suggesting that participants chose alternation or repetition prediction strategies based on their immediately preceding recognition response. However, predictions did not influence subsequent memory judgment itself. Thus, although recognition judgments were used to inform predictions, these predictions did not actually alter recognition responses for these items. This suggests explicit predictions are not the basis of serial dependencies in recognition memory.

**A-0129 Enhancement of memory integration through action**

Anthony Macri, Arthur Boisson, Rémy Versace
Laboratoire d'Etude des Mécanismes Cognitifs (EMC), Lyon, France.

With life expectancy increasing, researchers look for ways to reduce memory alterations associated with aging. Versace et al. (2009, 2014) developed a model called Act-in explaining the age-related deficits as a decrease in memory integration which is a key mechanism responsible for the formation of memory traces which are composed of the sensory-motor features of past experiences. Finding a way to enhance integration is thus finding a way to enhance memory performance then providing an answer on how to reduce age-related memory deficits. This study investigated the role of action on different types of recall and results showed a beneficial impact of action on integration. These findings give empirical evidence that action needs to be included in stimulation/remediation technics/therapies.

**A-0763 Emotional False Memories for Pictorial Scripted Material: The Role of Distinctiveness**

Enrico Toffalini, Chiara Mirandola, Carla De Simone Irace, Cesare Cornoldi
University of Padova, Italy

Typically, false memories are less likely for emotional than for neutral events. An hypothesis is that emotionally charged material leads to more distinctive and detailed encoding of the to-be-remembered material. Participants (N = 77 young adults) were shown a false memory paradigm based on pictorial scripted material; the encoded events were either neutral, negatively valenced, or distinctive (but non-emotional). Both negative and distinctive events reduced the probability to incur false memories. Nonetheless, differences emerged in the subjective experience associated to false memories: negative material minimized the probability to associate remember judgments to false memories, whereas it did not affect familiar judgments. Thus, the effects of negative and distinctive events are more clearly characterized when the subjective memory experiences are considered.

**A-0937 The neural substrate of lateralized working memory representations**

Sabrina Brigadoi [1], Simone Cutini [1,5], Federica Meconi [1], Marco Castellaro [2], Paola Sessa [1,5], Mattia Marangon [3], Alessandra Bertoldo [2,5], Pierre Jolicœur [4], Roberto Dell'Acqua [1,5]
[1] Department of Developmental Psychology, University of Padova, Padova, Italy [2] Department of Information Engineering, University of Padova, Padova, Italy [3] Department of Social Sciences, Adam Mickiewicz University, Poznań, Poland [4] Département de Psychologie, Université de Montréal, Montréal, Québec, Canada [5] Centre for Cognitive Neuroscience, University of Padova, Padova, Italy
Event-related potentials recorded during cued visual working memory (VWM) tasks a) scale with memory load up to storage capacity and b) highlight a contralateral representation of lateralized memoranda. While previous neuroimaging studies identified the intra-parietal sulcus (IPS) as the neural underpinning of the former VWM properties, the hemodynamic counterpart of the latter highly replicable electrical finding has never been observed. We acquired fMRI data of healthy participants during a cued VWM task. Data-driven functional classification of voxels in delimited subregions of the posterior parietal cortex revealed a cluster of voxels in the superior IPS whose activity scaled asymptotically with setsize up to plateau, and a cluster in inferior IPS sensitive also to contralateral organization of visual memories.

**A-0520 Autobiographical Memory Sharing and Empathy Elicitation: Guilt and Shame Emotions**
Roza Kamiloğlu, Sami Gülgöz
Koç University, Istanbul, Turkey
Present study explored the role of autobiographical memory (AM) sharing on empathy elicitation. Empathy levels were assessed after participants (N = 109) were assigned to one of three conditions: (1) Shared narrative of an event in the form of AM with guilt and shame emotions, (2) Shared narrative of the same event in the form of AM without emotion, (3) Shared narrative of the same event in the form of descriptive text. The results showed higher empathic response for participants who read AM narratives with or without emotion than expository texts. While the effect of emotional AM on empathy elicitation was higher compared to non-emotional AM narratives, similarity of prior experiences was associated with empathy after reading shame narratives.

# Autobiographical memory II

**I042 session**
Tuesday, 19 July 2016 | 13:00 - 15:00 | Room 1
**Chair/Organizer: David Hallford**

**A-0745 Cognitive Experiments on Life-Logs (CELL): A New Approach to Study Recall of Personally Familiar Proper-Names using Emails**
Abhilasha A. Kumar [1], Allyson C. Rosen [2], Vihari Piratla [3], Sudheendra Hangal [1]
[1] Ashoka University, Haryana, India; [2] Stanford University, CA 94305, USA; [3] Amuse Labs, Dharwad, Karnataka, India
Everyone has had the experience of forgetting personally relevant names. Cognitive Experiments on Life-Logs (CELL) is a scalable new approach to measure recall of personally familiar proper names using computerized text-based analysis of email archives. In this paradigm, participants view sentences automatically generated from a year of their sent email and recall names of recipients or other familiar proper names. Preliminary analyses show that accuracy in familiar name recall and vividness of the memory decline with the age of the email. Participants also experience tip-of-the-tongue (TOT) states, which are being studied further by providing phonemic cues. These findings suggest that CELL can be applied as an ecologically valid web-based measure that uses existing life-logs to study memory processes.

**A-0756 Autobiographical memory recollected and shared in group and cognitive aging: Content analyses based on evaluating and categorizing components in life story narratives**
Aya Hosokawa [1], Toshiaki Muramoto [2]
[1] National Center for Geriatrics and Gerontology, Obu, Japan; [2] Tohoku University, Sendai, Japan
The study investigated effects of autobiographical memory recollected and shared in group session on cognitive aging emphasizing content analyses as well as administration of standardized cognitive tests. Twenty old adults shared autobiographical narrative in 5 life periods including infancy, childhood, adolescence, earlier adulthood, and later adulthood in 5 series of by-weekly group session during 10 weeks and received pre- and post-tests including MMSE and Logical Memory and Verbal Paired Associates from WMS-R. The participants associated more pairs in the post-test than the pre-test and showed greater reduced number of trial in paired association than the control group. The results were discussed with content analyses based on evaluation and categorization of components in 100 life story narratives.

**A-0768 "Being there" and remembering it: presence enhances encoding in autobiographical memory**
Dominique Makowski [1,2], Marco Sperduti [1,2], Serge Nicolas [1,2], Pascale Piolino [1,2,3]
[1] Memory and Cognition Lab, Institute of Psychology, University of Sorbonne Paris Cité, Paris, France [2] Center for Psychiatry & Neuroscience, INSERM U894, Paris, France [3] Institut Universitaire de France, France
Memory encoding is influenced by several processes, among which emotion and attention play a key role. These processes are also at the root of presence - the feeling of “being there” and react to a stimulus as if it was real. Surprisingly, no study has investigated the link between presence and memory encoding. Employing an original and ecological procedure, we tested the link between these two processes. After watching the movie Avengers: Age of Ultron, 244 participants responded to a memory questionnaire, and reported their subjective emotion experience and sense of presence during the movie. Presence positively correlated with memory performances. We discuss these findings in the framework of attentional and consciousness theories.

**A-0804 A Comparison of the Reminiscence Bump in Recall for Public Events to the Reminiscence Bump in Rated Importance of Public Events**
Jonathan Koppel, Dorthe Berntsen
Center on Autobiographical Memory Research, Aarhus University
When individuals are asked to cite particularly important public events of recent history, many events are cited most frequently by those who were in adolescence or early adulthood when the event occurred. In the current study, we used a sample of over 1000 Danes to compare the frequency of this reminiscence bump in recall to the frequency of the parallel effect in rated importance of public events, that is, the proportion of events that would be rated as most important on a Likert scale by individuals who were in adolescence or early adulthood at the time. We found little evidence of a parallel reminiscence bump in rated importance, suggesting that mnemonic accessibility underlies the bump in recall for public events.

**A-0842 Memory, Mental Time Travel and The Moustachio Quartet**
Nicola Clayton, Clive Wilkins
Department of Psychology, University of Cambridge
Mental time travel allows us to re-visit our memories and imagine future scenarios. In this paper we will explore the complex relationships between memory and human experience, including examples taken from ‘The Moustachio Quartet’, a series of novels that can be read in any order. Integrating evidences from science and the arts we will explore the subjective nature of memory and mental time travel, and will argue that it has evolved primarily for prospection as opposed to retrospection. Furthermore we will question the notion that mental time travel is a uniquely human construct, and argue that some of the best evidence for the evolution of mental time travel comes from our distantly related cousins, the corvids.

**A-0869 Direct and generative retrieval of autobiographical memories**
Eszter Somos, Giuliana Mazzoni, Tjeerd Jellema
University of Hull
We examined if generative and/or direct retrieval of specific autobiographical memories is effortful and at which retrieval stage cognitive resources are mostly required. Participants took part in an episodic and a high-level memory session, and performed either a visual search task or a verbal random number generation (RNG) task to manipulate cognitive load during memory retrieval in response to high-imageability cue words. The visual task slowed down generative episodic retrieval but not direct retrieval. The RNG task did not affect either retrieval mode. Neither task affected the retrieval times of higher-level memories. These results suggest that episodic generative retrieval relies on the availability of cognitive resources in the visual domain, predominantly in the final stage of the search process.

**A-0945 The ERP correlates of self-knowledge in relation to world-knowledge and episodic memory**
Annick Tanguay [1], Lauren Benton [2], Lorenza Romio [3], Carolin Sievers [3], Patrick S. R. Davidson [1], Louis Renoult [3]

[1] School of Psychology, University of Ottawa, Canada [2] Department of Neuroscience, Dickinson College, USA [3] School of Psychology, University of East Anglia, UK

Self-knowledge (SK) is an “intermediate form” of declarative memory conceptually, but its ERP correlates have not been compared to both semantic memory (SM) and episodic memory (EM). Sixteen adults verified if character traits (e.g., persistent) were true of them (SK condition), or true of most people holding an occupation (e.g. soldiers; SM condition). The study ended with an EM recognition task with old and new traits. The N400 – an index of semantic processing – was larger for SM compared to SK and EM. The LPC – an index of episodic memory – was maximal for personal forms of memory (EM and SK) and minimal for SM. Thus, the neural correlates of SK appear distinct from SM.

**A-1062 Less Specific and More Overgeneral Autobiographical Memory as a Transdiagnostic Factor in Psychopathology**

David Hallford

Deakin University

The tendency to report general rather than specific autobiographical memories (AM) during voluntary retrieval tasks is manifest in clinical depression, trauma-related disorders, and schizophrenia-spectrum disorders. This presentation will propose that less specific and more overgeneral AM is a broader transdiagnostic factor than is currently conceptualised. To support this contention, a systematic review of studies examining the effect of psychopathology on AM retrieval, while controlling for depression, is presented. Following this, a contemporary model of the mechanisms underpinning AM dysfunction (the CaR-FA-X model; Capture and Rumination, Functional Avoidance, and Impaired Executive Functioning) is proposed to have transdiagnostic application. Future directions for research are discussed, as well as the role of AM therapeutics.

# Towards a mechanistic understanding of memory development: Evidence from behavior and cognitive neuroscience

**S0023 session**
Tuesday, 19 July 2016 | 13:00 - 15:00 | Room 2
**Chair/Organizer: Noa Ofen, Yee Lee Shing**
**Discussant: Lynn Nadel**

**A-0442 In search of the Holy Grail: just how useful is the amnesia filter when assessing infant memory?**
Sinéad Mullally, Alexandra Houston
Newcastle University, UK
When selecting a memory task, the question of whether it depends upon the hippocampus is never far from the cognitive neuroscientist's mind. Choosing the appropriate memory task to assess infant memory thus poses a unique set of challenges when one considers the relative dearth of neuroimaging and neuropsychological data available to guide this process. Here we will present data from a cohort of infants (n>100) who performed an array of infant-friendly memory tasks, and discuss their performance on these tasks relative to a group of amnesic patients with seemingly-selective and bilateral hippocampal atrophy. Consideration will also be given to the question of just how useful and appropriate this approach is when attempting to elucidate the neural correlates of early memory.

**A-0209 Neural mechanisms of episodic memory development: Effects of school entry**
Yee Lee Shing [1,2], Garvin Brod [2], Ann-Kristin Meyer [2], Pedro M. Paz-Alonso [3], Yana Fandakova [4]
[1] Division of Psychology, University of Stirling; [2] Center for Lifespan Psychology, Max Planck Institute for Human Development; [3] BCBL, Basque Center on Cognition Brain and Language; [4] University of California, Davis & Berkeley, USA
The effects of entering formal schooling on brain development are poorly understood. In this longitudinal study, we examined the development of neural correlates of episodic memory encoding in children who experienced their first year of schooling compared to kindergarten children of similar age (baseline age = 5.5 years, follow-up age = 6.5 years). Focusing on the prefrontal cortex (PFC) and medial temporal lobe (MTL), children in this age range relied strongly on the MTL but little on the PFC for forming memory representation. However, compared to the kindergarteners, school children showed stronger increase in engagement of the PFC after one year of schooling. Therefore, schooling as an experience sculpts the neural networks associated with successful memory formation.

**A-0207 Differential Coupling of Categorization and Memory across Development**
Sophia Deng, Vladimir Sloutsky
The Ohio State University, Columbus OH, USA
What information do people attend to and retain in category learning? How do these processes affect categorization? In a series of developmental studies, we've found that whereas adults attend selectively to category-relevant information, young children attend diffusely. Importantly, more efficient selective attention in adults is associated with worse memory for exemplars, whereas less efficient diffused attention in young children is associated with better memory. Furthermore, by manipulating attention exogenously, we can change adults' categorization strategy and memory. In contrast we can only change young children's categorization strategy, whereas their memory remains uniformly high. These results coupled with computational simulations suggest an important dissociation between representation and decision in categorization early in development and coupling of these processes later in development.

**A-0259 The Development of Memory and Decision-Making**
Diana Selmeczy, Simona Ghetti
University of California, Davis
Although there is a good body of research examining the development of metacognitive monitoring, relatively fewer studies have examined the relation between metacognitive monitoring and decision-making. We manipulated: a) the accuracy of environmental cues (Experiment 1; N= 34, Projected N= 96) and b) factors promoting illusory feelings of confidence (Experiment 2; N=72) to examine the effect of these variables on decision-making in children between ages 5 and 9 years and adults. Participants completed recognition and metacognitive judgments, and preliminary results suggest that environmental cues and illusory feelings of confidence influence children's decisions beginning around 6-7 years of age. Our discussion will focus on developmental differences in children's sensitivity to these factors and their implications for decision-making, learning, and self-regulation.

**A-0206 Neurodevelopmental correlates of the testing effect**
Pedro M. Paz-Alonso, Jaione Arnaez-Telleria, Garikoitz Lerma-Usabiaga, Manuel Carreiras
BCBL. Basque Center on Cognition, Brain and Language
Extensive behavioral research showed that retrieval practice is highly beneficial for long-term memory. However, limited evidence exists on the developmental trajectories and the neural mechanisms supporting this effect. Here, we present data from behavioral and fMRI studies involving 8-to-12-year-olds and adults. Results showed age-related increases in long-term memory benefits of study versus retrieval practice. Although similar brain regions were recruited for study- and retrieval-practice conditions, differential functional connectivity profiles emerged for successful retrieval as a function of these conditions. Whereas study practice showed stronger coupling among MTL regions, retrieval practice showed tighter connectivity between MTL-PFC and fronto-parietal regions. Our data revealed age-related increases in retrieval practice benefits over development and different MTL-cortical neural dynamics for study versus retrieval practice.

**A-0297 Relational binding in late childhood: eyetracking and neuroimaging studies of typical and atypical development**
Jamie Edgin, Yating Liu, Stella Sakhon, Goffredina Spano, Caron Clark
University of Arizona
In previous studies we have shown transitions in the nature of contextual binding across early to late childhood, likely reflecting inflexible memory formation, and unitized binding, in young children with shifts to greater flexibility across development. This talk explores later emerging developments in binding functions (e.g., after 7 years), including neuroimaging evidence to suggest that later transitions are partially due to development of frontal cortex and show alterations in autism spectrum disorders. In addition, the rapid memory-guided eye movements often measured in adults are not yet mature in late childhood, further suggesting that binding has an extended developmental trajectory well beyond the

preschool years.

**A-0295 Prefrontal cortex contributions to episodic memory development**

Lingfei Tang, Andrea Shafer, Qijing Yu, Noa Ofen
Wayne State University, Detroit, USA

Episodic memory is critical for everyday functioning at all ages, yet little is known about neural underpinnings that support improvements in episodic memory. I will present data on neural mechanisms that support memory development and highlight evidence of age-related increase in the functional contribution of the prefrontal cortex to memory. We find that the structural integrity of the prefrontal cortex mediates age related improvement in the use of mnemonic strategies, and that the levels of activation and deactivation in this region mediate age related improvement in an episodic memory task. I will also highlight findings suggesting that the interaction of the prefrontal cortex with structures in the medial temporal lobe underlies changes in memory functioning throughout childhood and adolescence.

# Prospective memory in normal and abnormal ageing

**S0027 session**
Tuesday, 19 July 2016 | 13:00 - 15:00 | Room 3
**Chair/Organizer: Agnieszka Niedźwieńska**
**Discussant: Lia Kvavilashvili**

**A-0238 The contrasting prospective memory performance of young and older adults in laboratory versus naturalistic setting**
Peter Rendell, Susan Sapega, Gill Terrett, Nathan Rose
Australian Catholic University, Melbourne, Australia
Age-related deficits on laboratory prospective memory (PM) are often eliminated in naturalistic studies. Event-based PM tasks dominate laboratory studies, but have been absent from naturalistic studies. Time-based PM tasks are short interval time-check and time-of-day tasks in laboratory and naturalistic studies respectively. In this novel study, participants (40 young and 40 older adults) completed in each setting, parallel versions of event-based, time-check and time-of-day PM tasks. There were age-related deficits on each PM task in laboratory setting. In the naturalistic setting, older adults did poorly on PM tasks that required monitoring short time intervals, but they did much better on PM tasks with event cues or tasks occurring at set times of day that can be accompanied by event cues.

**A-0239 Do focality and cue-action association differently impact prospective memory (PM) in young and older adults?**
Nicola Ballhausen, Katharina Schnitzspahn, Matthias Kliegel
University of Geneva, Geneva, Switzerland
The multiprocess theory of PM has been used to explain and to predict PM performance by characteristics of the PM cue and of the ongoing task. While there has been some work on cue focality, less studies examined the association of the target cue and the to-be-performed action. This study on young and older adults investigated both focality and cue-action association. Besides specifying the relative importance of these factors, for the first time interaction effects were tested. Preliminary data analyses reveal main effects of age and cue-action association on PM performance, and an interaction of focality and cue-action association, but neither a main effect of focality nor any other interactions. Results are discussed regarding current PM theories and underlying mechanisms.

**A-0240 Strategy and process-based cognitive trainings of event-based prospective memory in older adults**
Rafał Albiński [1], Kamila Gurynowicz [1], Matthias Kliegel [2]
[1] University of Social Sciences and Humanities, Warsaw, Poland; [2] University of Geneva, Geneva, Switzerland
Prospective memory (PM) is defined as a form of memory responsible for remembering about intentions and plans. As PM is crucial in everyday life, developing techniques that allow to increase PM functioning becomes a pressing matter. Here we present the results of a four week event-based PM cognitive training program, aimed at the first (intention creation) phase of PM. One group (N = 19) completed a process-based training (working memory training), whereas second group (N = 21) completed a strategy-based training (pairing words with actions) - the results were compared to a control condition (N = 19). Our results show significant improvement in the strategy-based training condition, with no significant improvement in either process-based training or control conditions.

**A-0241 Prospective memory deficits in Mild Cognitive Impairment: The lab performance versus everyday memory failures**
Agnieszka Niedźwieńska [1,2], Lia Kvavilashvili [1], Kunle Ashaye [3]
[1] University of Hertfordshire, Hatfield, England; [2] Jagiellonian University, Cracow, Poland; [3] Lister Hospital, Stevenage, England
Two studies focused on clarifying the nature of prospective memory (PM) problems in Mild Cognitive Impairment (MCI) in and outside the laboratory. In the lab, we investigated which type of PM task (focal vs. non-focal) was particularly disrupted in MCI compared to age-matched healthy older adults. The PM decline in MCI was significant for focal tasks that were based on spontaneous retrieval, but not for non-focal tasks requiring strategic retrieval. Outside the lab, participants kept a 7-day diary of memory failures that were subsequently classified into PM, retrospective memory and absent-minded lapses. Only retrospective memory lapses were more frequent in MCI, but MCI individuals experienced certain types of serious PM failures that were never reported by healthy older adults.

**A-0242 Assessment and cognitive correlates of Prospective Memory Function in Mild Cognitive Impairment and Early Dementia**
Claire L. Thompson [1], Julie D. Henry [2], Peter Rendell [3], Adrienne Withall [4], Henry Brodaty [4]
[1] James Cook University (Australia), Singapore campus; [2] University of Queensland, St Lucia, Australia; [3] Australian Catholic University, Melbourne, Australia; [4] University of New South Wales, Sydney, Australia
MCI and dementia are associated with impaired prospective memory (PM) but there is no clear standard for assessment of PM and little data on its relation to other aspects of cognition. Older adults with MCI, dementia, and controls did five PM measures: comprehensive assessment (Virtual Week), naturalistic assessment done in everyday life, brief unstandardised measure, self-report and informant-report. Virtual Week was repeated after a one-year period. MCI and dementia-related difficulties were observed at baseline and follow up. PM failures were observed on all measures except self-report. PM was related to several neuropsychological domains. Different PM assessment methods vary in their sensitivity. For all three groups, both self-reports and informant-reports showed poor validity, at best correlating only weakly with objective assessments.

**A-0243 Applications of prospective memory assessment in clinical neuropsychology**
Alberto Costa
Istituto di Ricovero e Cura a Carattere Scientifico Fondazione Santa Lucia, Rome, Italy
Prospective memory (PM) includes different cognitive operations that sustain the future realization of intentions. Some findings indicate that, in individuals with brain diseases and in persons with increased risk to develop dementia, PM performance may be worse than that on tests sensitive to other cognitive functions. This report will discuss the potential clinical application of PM paradigms. In particular, there will be presented and discussed results of those studies indicating that PM performance can help discriminating between individuals with and without cognitive disorders. Some data that evidence, in individuals with Parkinson's disease associated with mild cognitive impairment, the potential applicability of PM paradigms as rehabilitation outcome will be also discussed.

**A-0244 Sustaining Autonomy in Amnestic Mild Cognitive Impairment: an Early Diagnosis for a Better Outlook**
Antonina Pereira [1], Alexandre de Mendonça [2], Judi Ellis [3]

[1] University of Chichester, Chichester, England; [2] University of Lisbon, Lisbon, Portugal; [3] University of Reading, Reading, England

Prospective memory (PM) is a fundamental requirement for an autonomous lifespan that might be prematurely compromised in the neurodegenerative process, namely in amnestic mild cognitive impairment (aMCI), severely affecting an independent lifestyle. We have used a behavioural experimental paradigm to explore PM as a non-invasive neuropsychological tool for an earlier aMCI diagnosis while assessing the potential benefits of the use of enactment at encoding to sustain an autonomous performance despite neuronal degeneration. PM was consistently identified as a particularly sensitive and specific indicator of cognitive impairment. Importantly, observed beneficial effects of enacted encoding have unveiled the potential of this encoding technique to optimize attentional demands through an adaptive allocation of strategic resources across both a healthy and cognitively impaired lifespan.

# Memory Flexibility: From molecular mechanisms to clinical applications

**S0018 session**

Tuesday, 19 July 2016 | 13:00 - 15:00 | Room 4

**Chair/Organizer: Marijn Kroes, Bryan Strange**

**A-1049 Dopamine signalling in the amygdala and the reactivation of a fear memory.**

Emma Cahill, Barry J Everitt, Amy L Milton

Behavioural and Clinical Neuroscience Institute, Dept. of Psychology, University of Cambridge, Dept. of Psychology, Cambridge CB2 3EB, United Kingdom

Fear forms strong memories. A reactivated memory can change behaviour. To update a memory, it is thought it first becomes destabilised under certain conditions of reactivation. Fear reactivation engages dopamine in the amygdala (Yokoyama et al., 2005), but its contribution to reactivation and destabilisation of memory is unclear. Dopamine may be a modulator of fear memory through its ability to regulate synaptic mechanisms. Following a combination of behavioural testing (Pavlovian fear-conditioning), pharmacological intervention and molecular analysis in rodents, we found the reactivation of a fear memory activated the Extracellular Regulated Kinase (ERK) pathway in the amygdala downstream of dopamine receptors. The results deepen our understanding of the molecular mechanisms downstream of dopamine signalling for reactivation and destabilisation of memories.

**A-1048 Reconsolidation of instrumental memories**

Marc Exton-McGuinness, Jonathan Lee

University of Birmingham, UK

It has become increasingly accepted that memories are dynamic, and update so they can appropriately inform our behaviour. This updating is believed to occur via a process of “reconsolidation” which incorporates new information; however it also renders the memory temporarily vulnerable to amnestic intervention. The ability to weaken the memories underpinning maladaptive behaviours would have significant therapeutic benefit; however the majority of research in this field has centred on aversive Pavlovian memories. Recently we demonstrated that instrumental memories, previously thought not to undergo reconsolidation, do in fact reconsolidate. These memories are significant as they play a key role in maladaptive reward-seeking behaviours such as drug addiction, and disrupting them would present an exciting new therapeutic avenue.

**A-0158 Emotional remodeling as a new therapeutic approach for post traumatic stress disorder and for dependance for drug of abuse**

Pascale Gisquet-Verrier [1], Claire Le Dorze [1], Charles Siegfried Peretti [2]

[1] Neuro-PSI, Université Paris-Sud, CNRS UMR9197, Université Paris-Saclay, Orsay F 91400, France [2] Service de Psychiatrie, Hôpital Saint-Antoine, Paris; F75012, Paris, France

When in an active state (after training or reactivation), memory is malleable and can integrate new information. Malleability is usually viewed as critical for memory updating. Numerous evidence indicates that integration of information can concern any information, including emotional aspects of a memory. We thus used the malleability of memory to modify the emotional content of pathological memories. The concept was to modify the emotional content of trauma or drug memories by reactivating it, while the subjects were placed in a positive state. Our results obtained in rats and humans suggest that emotional remodeling can be seen as a promising and innovative avenue to treat people affected by post traumatic stress disorder or dependence for drug of abuse.

**A-1029 How a blood pressure drug may attenuate emotional memories**

Lars Schwabe [1,2], Karim Nader [2], Jens C. Pruessner [2]

[1] University of Hamburg, Germany; [2] McGill University, Montreal, Canada

Emotional experiences are typically better remembered than mundane events and this emotional memory enhancement is thought to contribute to anxiety disorders or PTSD. Based on findings indicating that the superior emotional memory is due to noradrenergic arousal and that memories can be modified after their reactivation (i.e., during reconsolidation), we asked whether beta-adrenergic blockade during reconsolidation could reduce the emotional memory enhancement. Our results show that, compared to a placebo, the administration of the beta blocker propranolol after the reactivation of previously learned items reduced the subsequent memory for the reactivated emotional material. This change in emotional memory was accompanied by activity changes in those brain areas that were recruited during memory reactivation, in particular the amygdala and the hippocampus.

**A-1054 How Administration of the Beta-Blocker Propranolol Before Extinction can Prevent the Return of Fear**

Marijn Kroes [1,2], Klodiana-Daphne Tona [3], Hanneke den Ouden [3], Susanne Vogel [1], Guido van Wingen [4], Guillen Fernandez [1]

[1] Radboud University Nijmegen Medical Center; [2] New York University; [3] Radboud University Nijmegen, [4] University of Amsterdam

A brief reminder can renew flexibility of old fear memories and when combined with beta-blockers can prevent the return of fear responses. The effect of beta-blockers on extinction learning triggered by prolonged or multiple reminders is however unclear. Here we show that in humans beta-blockade during extinction learning caused a loss of fear responses, and prevented subsequent return of fear and decreased explicit memory for fearful events in the absence of drug. Our fMRI results indicate that beta-blockade can prevent the return of fear by (i) reducing retrieval of fear memory, via the dmPFC and (ii) increasing contextual safety learning, via the hippocampus. Our findings increase knowledge how beta-blockers can prevent the return of fear.

**A-0160 Post-retrieval new learning does not reliably induce human memory updating via reconsolidation**

Tom Hardwicke, Mahdi Taqi, David Shanks

University College London

Reconsolidation theory proposes that retrieval can destabilize an existing memory trace, opening a time-dependent window during which that trace is amenable to modification. In human reconsolidation studies new learning is often employed as a means of ‘updating’ or ‘rewriting’ traces. Recently we attempted to replicate and extend a prominent 3-day motor-sequence learning study (Walker et al., 2003; N = 16) that is widely cited as evidence for reconsolidation-mediated memory updating in human participants. However, in several replication attempts (N = 112) we did not observe any reconsolidation effects when testing either procedural or declarative recall of sequence knowledge. These findings suggest that post-retrieval new learning does not reliably induce human memory updating via reconsolidation.

**A-1053 The effect of sedation on reconsolidation of emotional episodic memory in humans**

Ana Galarza-Vallejo [1], Marijn CW Kroes [2], Victoria Acedo [3], Enrique Rey [3], Bryan A. Strange [1,4]
[1] Laboratory for Clinical Neuroscience, Ctr. For Biomedical Technology (CTB), Madrid, Spain; [2] New York University, New York, NY, USA; [3] Hospital Clínico San Carlos, Madrid, Spain [4] Reina Sofia Centre for Alzheimer's Research, Madrid, Spain

Following reactivation, memories can become labile. Disrupting memory restabilization may be a promising tool for treating psychiatric diseases. We recently showed that electroconvulsive therapy (ECT) impairs reconsolidation in depressed patients. One limitation of this study is that we could not determine which component of the ECT impaired reconsolidation. In the current study, we explored the reconsolidation impairment effect of general anaesthesia (propofol) with an emotional memory paradigm that included two groups of psychiatric/neurologically normal individuals. All participants encoded two emotional stories, with one reactivated immediately prior to propofol administration. Strikingly, we observed impaired emotional memory selectively for the reactivated, but not the non-reactivated, story, tested after 24h. Thus a routinely used anaesthetic can selectively impair reconsolidation of emotional episodic memories.

**A-0172 A light-touch behavioural intervention for inducing amnesia for acquired fear memories**

Anastasia Chalkia, Lauranne Vanaken, Riet Fonteyne, Tom Beckers
KU Leuven, Leuven, Belgium

There is a recent surge in research that tries to experimentally induce amnesia for previously established emotional memories, with the hopes of eventually developing novel therapeutic tools for the treatment of PTSD and other emotional disorders. This reconsolidation interference research has used a variety of approaches, including pharmacological reconsolidation blockade, memory updating after reactivation, administration of electroconvulsive shock during reconsolidation, and others. However, existing experimental approaches either have characteristics that complicate their clinical translation (e.g., ECS, pharmacological tools) or have defied robust replication. We will report on a study that aims to develop a new, light-touch behavioural intervention for inducing amnesia for acquired fear memories that may avoid some of the problems associated with existing approaches.

# Episodic Memory and Aging: Perspectives on Brain and Behavior

**S0037 session**

Tuesday, 19 July 2016 | 13:00 - 15:00 | Room 5

**Chair/Organizer: Moshe Naveh-Benjamin**

**A-0350 Effects of High Educational Level and High Cognitive Ability on Item and Associative Memory in Older Adults**

Moshe Naveh-Benjamin

University of Missouri, Columbia, USA

Numerous studies demonstrate that episodic memory declines with age. One suggestion is that this decline reflects older adults' poorer ability to create cohesive episodes due to inefficient binding of episode components (e.g., associative deficit hypothesis, Naveh-Benjamin, 2000). In the current studies, we assessed whether older adults with high education level and high cognitive ability would show less of an associative memory deficit relative to younger adults than would older individuals with an average level of education, and if so, whether such a pattern would be mediated by better executive-strategic abilities. The results of two experiments involving encoding and retrieval of either person-activity pairs or unrelated word pairs will be presented and discussed.

**A-0351 Structural Brain Correlates of Associative Memory in Younger and Older Adults**

Nina Becker [1,2], Grégoria Kalpouzos [2], Erika J. Laukka [2], Lars Bäckman [2], Yvonne Brehmer [1,2]

[1] Max Planck Institute for Human Development, Berlin, Germany; [2] Karolinska Institute, Stockholm, Sweden

Besides a general age-related decline, older adults differ substantially in associative-memory performance. This form of memory depends on the interplay between regions in medial temporal lobe (MTL) and prefrontal cortex (PFC). Accordingly, preserved volume of these regions may indicate preserved associative memory in aging. Using voxel-based morphometry, we will investigate gray-matter volumetric correlates of associative memory (item-associative memory task, including word pairs) in younger and older adults. The study will further our understanding of whether well-functioning associative memory in old age draws on the same or different brain regions as in early adulthood, and shed light on the relative contribution of PFC and MTL volumetric characteristics to individual differences in associative memory in aging.

**A-0352 Associative and Item Memory Decline in Older Adults: fMRI and DTI Evidence**

Roberto Cabeza

Duke University, Durham, USA

Memory aging has been linked to an executive factor related to the prefrontal cortex (PFC) and a memory factor related to the medial temporal lobes (MTL). Associative memory is assumed to depend on both factors, whereas item memory is thought to depend mainly on the memory factor. In a DTI-fMRI study of associative memory, low-executive older adults (OAs) were impaired in PFC white-matter, and low-memory OAs, in MTL white-matter. Whereas low-executive OAs over-recruited PFC, low-memory OAs over-recruited the hippocampus (less-wiring-more-firing compensation). In a network analysis of DTI data using graph theory, PFC's contributions to the item-memory network were altered in both low- and high-memory OAs, whereas rhinal cortex contributions were impaired in low- but not high-memory OAs.

**A-0353 Testing Large-Scale Age-Related Differences in Brain Activity**

Alexa M. Morcom [1], Research Team CamCAN [2], Richard N. A. Henson [1]

[1] University of Edinburgh, Edinburgh, UK; [2] Cambridge Centre for Ageing and Neuroscience, Cambridge, UK

Functional imaging studies have suggested striking differences in the regions engaged by young and older adults which may shed light on resilience to cognitive decline. A 'posterior-anterior shift' (PASA) may occur, with greater engagement of prefrontal relative to posterior regions. We tested for this directly with fMRI data from an episodic encoding task in a population-derived sample (N=123, 18 to 88 years; www.cam-can.com). Multivariate Bayesian decoding measured information carried about the success of memory encoding. This was reduced in older adults in prefrontal and in posterior cortical regions (visual and parahippocampal). Furthermore, contrary to PASA, comparison of combined prefrontal and posterior models with posterior models did not reveal any 'boost' to the information carried about memory with increasing age.

**A-0354 Dopamine Modulation of the Frontal-Hippocampal-Striatal Circuitry: Implications for the Aging of Memory and Spatial Learning**

Shu-Chen Li

TU Dresden, Dresden, Germany

The efficacy of various neurotransmitter systems declines with advancing age. Of particular interest, various pre- and post-synaptic components of the frontal and striatal dopaminergic systems show substantial negative age-related differences across the adult life span. This talk will selectively highlight findings from recent multimodal neuroimaging, pharmacological and genetic studies that have provided new insights for the role of deficient dopamine modulation in a wide range of aging-related memory impairments that implicate dopamine modulation of the frontal-hippocampal-striatal circuitry, including: working memory, episodic memory, source memory and spatial learning. The empirical evidence will be discussed in the context of a neurocomputational theory of aging neuronal gain control.

**A-0355 Alzheimer's-Related Biomarkers Contribute to Differential Longitudinal Trajectories in Non-demented Memory Aging**

Roger A. Dixon, G. Peggy McFall

University of Alberta, Alberta, Canada

Recent longitudinal cognitive aging research assesses multiple risk factors and biological markers of mechanisms underlying preclinical neurodegeneration. Using Alzheimer's disease (AD) biomarkers, we examine independent and interactive predictions of non-demented cognitive change. Present approach: We test intensification roles of biomarkers of neurovascular health (pulse pressure, PP) and genetic risk (Apolipoprotein E and Clusterin) on 9-year trajectories of memory change across a 40-year band (55-95 years). With a validated episodic memory latent variable, we use latent growth modeling to test trajectory modification hypotheses. Basic result: PP predicts systematic fanning of memory slope trajectories. Intensification result: Whereas memory decline slopes are exacerbated by risk-elevating AD biomarker combinations, maintenance slopes are predicted by risk-reducing combinations.

# Consolidation of procedural learning

**S0028 session**

Tuesday, 19 July 2016 | 13:00 - 15:00 | Room 6

**Chair/Organizer: Dezso Nemeth, Edwin Robertson**

**A-0413 Instability and interaction between different types of memory**

Edwin Robertson

University of Glasgow, Glasgow, UK

I will discuss the interaction between different types of memory, how this occurs, and what purpose it may serve. Together these results provide a new perspective upon the organization of human memory, and the function served by a memory being unstable (i.e., susceptible to interference).

**A-0414 Motor learning, fatigue and the reorganization of brain networks**

Philippe Peigneux, Alison Mary, Guillermo Borragan

Université Libre de Bruxelles (ULB) , Belgium

In this talk I will discuss and present behavioral, magnetoencephalography (MEG) and near infrared spectroscopy (NIRS) studies evidencing (a) reduced experience-dependent plasticity in the aging brain, and the age-dependent reorganization of the large-scale functional networks involved in the early stages of motor memory consolidation before sleep and (b) how cognitive fatigue impact on cerebral activity and paradoxically facilitates the development of novel motor skills

**A-0415 The importance of distinguishing general skill and sequence-specific components in sequence learning: Evidence from task sequence learning and consolidation**

Beat Meier, Brigitte Weiermann, Josephine Cock

Institute of Psychology and Center for Cognition, Learning, and Memory, University of Bern, Switzerland

The purpose of this study was to test learning and consolidation in implicit task sequence learning (TSL). With TSL, learning a cognitive sequence can be tested without the involvement of a visuo-motor sequence. It is thus especially suited to test the consolidation of learning unconfounded by visual and motor sequence information. We assessed general skill and sequence-specific learning separately, and tested their consolidation by examining performance again after a 24h retention interval containing sleep. The results show that general skill and sequence-specific representations follow a different pattern of consolidation, with an increase in performance for general skill but not for sequence-specific learning after 24h. The study underlines the importance to systematically separate general skill and sequence-specific learning.

**A-0412 Competitive neurocognitive networks underlying implicit statistical learning**

Dezso Nemeth[1,2], Karolina Janacsek [1,2]

[1] Hungarian Academy of Sciences [2] Eötvös Loránd University

Human learning depends on multiple cognitive systems related to dissociable brain structures. These systems interact not only in cooperative but sometimes competitive ways in optimizing performance. Previous studies showed that manipulations reducing the engagement of frontal lobe-mediated explicit, attentional processes can lead to improved performance in striatum-related procedural learning. Here we present three studies in which we investigated the competitive relationship between statistical learning and frontal lobe-mediated executive functions. We found negative correlation between these functions. Our result shed light not only on the competitive nature of brain systems in cognitive processes, but also could have important implications for developing new methods to improve human learning.

**A-0416 Sleep-independent offline enhancement and time of the day effects in three forms of skill-learning**

Ferenc Kemeny, Agnes Lukacs

Department of Cognitive Science, Budapest University of Technology and Economics, Budapest, Hungary

The role of sleep in memory and skill learning processes is an important and widely debated issue. The study explores offline improvement with or without sleep in three tasks for measuring different aspects of skill learning: the Serial Reaction-Time (SRT) task, which is a motor sequence learning task, the Artificial Grammar Learning (AGL) task, testing abstract verbal sequence learning, and the Weather Prediction (WP) task, which is a non-sequential categorization task. Results showed only a sleep-independent effect on the SRT-task, no other sleep-related or sleep-independent effects were found. Results also show a time of the day effect: the Sleep group outperforming the Wake group, however, this was most observable in the non-sequential component of the SRT task.

**A-0418 Adjusting Skill Learning Protocols to Aid Learning and Consolidation in Developmental Disorders**

Esther Adi-Japha

Bar-Ilan University

Atypical learning and consolidation of motor skills was reported in several developmental disorders, including attention deficit hyperactivity disorder (ADHD) and specific language impairment (SLI). The evidence suggests that individuals with ADHD tend to perform inaccurately, and their inaccuracy is even enhanced 24-h post-training. Individuals with SLI display an initial learning rate that is slower than that displayed by their peers without the impairment. Furthermore, these children do not retain their learning well between sessions. It has been suggested that adjustments in the learning protocols can improve learning and consolidation. I will claim that the type of adjustments is different for different disorders. Implications for the learning environment will be discussed.

**A-0419 Learning, consolidation, and compensation in neurodevelopmental disorders**

Michael Ullman

Georgetown University, Washington DC

Learning and memory systems have been increasingly implicated in neurodevelopmental disorders, including dyslexia, specific language impairment, autism, Tourette syndrome, and ADHD. Here I provide a brief overview of the status of procedural and declarative memory, including learning, consolidation, and compensation, in neurodevelopmental disorders. I will discuss clinical implications.

# Storytelling, scaffolding, success and sensitivity in collaborative memory across the lifespan

**S0033 session**
Tuesday, 19 July 2016 | 13:00 - 15:00 | Room 7
**Chair/Organizer: Amanda Barnier**
**Discussant: William Hirst**

**A-0358 Voice and Silence in Family Storytelling**
Robyn Fivush
Emory University, Atlanta, USA
Families engage in telling stories of their shared and familial past in everyday conversations. These stories create and maintain family bonds and family identity across generations, and family storytelling is generally related to positive child outcome. However, individual differences in family storytelling also matter. Some families implicitly and explicitly allow the expression and integration of multiple perspectives, or “voices”, whereas other families constrain the narrative in ways that “silence” certain perspectives. I describe a theoretical model and preliminary coding scheme of voice and silence in family storytelling. Families that engage in creating multi-voiced narratives of both the shared and intergenerational past, that express and integrate multiple perspectives, have children with high levels of identity and well-being.

**A-0359 Reminiscing Conversations Between Parents and Adolescents: Relationships With Youth Mental Health**
Karen Salmon [1], Elaine Reese [2], Paul Jose [1], Kate Bryson [1]
[1] Victoria University of Wellington, Wellington, New Zealand, [2] University of Otago, Otago, New Zealand
Parent-child reminiscing conversations focusing on everyday past experiences play a key role in cognitive and socioemotional development. At their most constructive, parents help their children to talk about, understand, and appraise negative emotional experiences. We know little about the style and content of these conversations when children are experiencing psychological distress, however, and even less from the adolescent period. Drawing on longitudinal and cross-sectional data, we compare key aspects of reminiscing conversations between mothers and adolescents with higher or lower psychopathology, focusing, in particular, on how past negative emotions are managed. Our findings have implications for understanding the role of parent-child reminiscing conversations in maintaining youth emotional dysfunction.

**A-0360 Culture and Collaborative Conversation: Talking About Past and Future in European-American and Chinese Families**
Jessie Bee Kim Koh [1], Qi Wang [2]
[1] University of Alberta, Alberta, USA [2] Cornell University, New York, USA
How parents and children collaborate with each other during conversations serves culture-specific socialization goals. We examined the conversational styles between European-American and Chinese mothers and their school-aged children (N = 103). Mother-child pairs each talked about two past and two future events. No matter whether children produced information about the events, European-American mothers were more likely to follow up with new information to encourage children to contribute, whereas Chinese mothers were more likely to switch topics. Following children’s utterances about internal states, European-American mothers were more likely to confirm, whereas Chinese mothers were more likely to ignore. Similar patterns of cultural differences also emerged in children’s responses following mothers’ utterances. We discuss the meaning of successful collaboration in cultural contexts.

**A-0362 Applying Social Memory Phenomena to Higher Education**
Michelle Meade [1], Penny Van Bergen [2], Vladimir A. Perga [1], Krista D. Manley
[1] Montana State University, Montana, USA, [2] Macquarie University, New South Wales, Australia
We examined the influence of social factors on memory for meaningful educational materials. In the first experiment, students were asked to recall textbook passages alone or in collaboration with a fellow student. Students in the collaborative condition recalled less than students in the nominal individual condition, thus demonstrating collaborative inhibition on the initial recall. However, collaborative inhibition disappeared on the subsequent individual recall test. In the second experiment, students were asked to recall brief video lectures with a confederate who remembered both accurate and inaccurate information from the videos. Students incorporated the confederates’ suggestions into their subsequent individual recall and recognition tests, demonstrating social contagion. We conclude that social memory phenomena are relevant to students in higher education.

**A-0270 “Subjective memory complainer seeks conscientious, elaborative scaffolder”: Developing a profile of successful collaboration in older couples.**
Katya Numbers [1], Amanda Barnier [1], Celia Harris [1], Thomas Morris [1], Greg Savage [2,3]
[1] ARC Centre of Excellence in Cognition and its Disorders, and Department of Cognitive Science, Macquarie University, Sydney, AU. [2] ARC Centre of Excellence in Cognition and its Disorders, and Department of Psychology, Macquarie University, Sydney, AU. [3] The Australian Imaging, Biomarkers and Lifestyle (AIBL) Study of Ageing.
Collaboration may facilitate older adults’ performance on a variety of memory tasks. This talk explores what the ‘profiles’ of successful collaborators within long-term older married couples might look like. Processes that influence collaborative memory performance in older adults include both inter- and intrapersonal factors. Interpersonal facilitative processes include turn taking and acknowledgement, explicit strategy adoption and scaffolding through personal cues. Intrapersonal variables include individuals’ beliefs about their own memory ability, stable personality traits and current mood. We discuss how older adults’ intrapersonal factors (e.g., personality or memory complaint status) may combine with interpersonal factors (e.g., idiosyncratic cuing or acknowledgements) to predict, and sometimes improve, collaborative performance with a long-term spouse on recall tasks.

**A-0363 Intimacy, Need, Strategy and Sensitivity: Patterns of Successful and Unsuccessful Social Memory Scaffolding**
Amanda Barnier, Celia Harris
Macquarie University, New South Wales, Australia
Developmental research on parental scaffolding of children’s stories of the past and other memories shows the clear value of an elaborative scaffolding style. One important element of successful scaffolding is sensitivity. Memory collaborators not only need to offer the kind of scaffolding that helps their partner, but they must be sensitive to the level of scaffolding their partner currently needs. Over eager scaffolding that swamps a partner’s contributions may be just as unhelpful as little or no scaffolding. We illustrate sensitive and successful scaffolding versus less sensitive and unsuccessful scaffolding with data and cases from two studies involving healthy long married older couples and long married older couples where

one partner is experiencing cognitive decline.

# Neuroscience of memory I

**I124 session**
Tuesday, 19 July 2016 | 13:00 - 15:00 | Room 8
**Chair/Organizer: Florin Dolcos**

**A-0784 Assessment of brain connectivity patterns in progression of Alzheimer's disease**
B. Bhuvaneshwari, A. Kavitha
SSN College of Engineering,Chennai,INDIA
Alzheimer's disease (AD) is a progressive brain disorder which has a long preclinical phase. The beta-amyloid plaques and tangles in the brain are considered as the main pathological causes. Functional connectivity is usually examined in capturing brain network dynamics in AD. A definitive underconnectivity is observed through the progressive stages of AD. This work involves assessing this functional topology with graph theoretical measures to understand the inter and intrahemispheric brain connectivity patterns. Graph theoretic modeling approaches have been established to understand the brain dynamics. Measures of functional integration and segregation in three progressive stages of AD have been examined. The fMRI images analyzed using graph theoretic approaches seem to reveal significant patterns of underconnectivity in AD.

**A-0863 Brain Activity and Network Interactions in the Impact of Autobiographical Recollection as Internal Emotional Distraction**
Florin Dolcos, Alexandru D. Iordan, Sanda Dolcos
University of Illinois, Urbana-Champaign, USA
Retrieval of negative autobiographical memories (AMs) are intrusive cognitions that can interfere with goal-oriented tasks. Their regulation is important for healthy functioning, whereas their dysregulation is associated with depression. This study investigated for the first time the neural mechanisms underlying the impact of AM recollection as internal emotional distraction, using fMRI and a working memory (WM) task with cues for negative AMs presented during the delay interval. Emotion regulation (ER) was manipulated by instructions to focus attention away from emotional aspects of AMs, during recollection, which diminished both their subjective negative (re)experience and their objective WM interference. Also, fMRI data showed increased activity and interactions in cognitive control large-scale brain networks and diminished activity in the salience network, during ER.

**A-0876 Implicit task sequence learning and consolidation: a continuous theta burst stimulation (cTBS) study**
Branislav Savic [1], Dario Cazzoli [2], René Müri [3], Beat Meier [1]
[1] Institute of Psychology, University of Bern, and Center for Cognition, Learning, and Memory; [2] University of Bern, ARTORG Center for Biomedical Engineering Research, Gerontechnology & Rehabilitation; [3] Bern University Hospital Inselspital, and Center for Cognition, Learning, and Memory
With the task sequence learning paradigm (TSL), implicit sequence learning can be measured without the involvement of a motor sequence. The aim of this study was to investigate the role of the dorso-lateral prefrontal cortex (DLPFC) for implicit sequence learning and consolidation. Participants received continuous theta burst stimulation (cTBS) above the DLPFC and later they performed the TSL. After 24 hours, participant re-performed the TSL without cTBS. The results showed that implicit sequence-specific learning was present in both sessions. Performances in the sequenced blocks improved across session, whereas implicit sequence-specific knowledge decreased across sessions. Noteworthy, cTBS did not influence performances. Hence, the TSL learning components have different consolidation trajectories and cTBS does not modulate implicit sequence learning and consolidation.

**A-0934 Gluing Memories via Oscillations: Theta phase synchronization drives associative memory formation in humans**
Andrew Clouter, Kimron L. Shapiro, Simon Hanslmayr
University of Birmingham, School of Psychology, UK
Multisensory episodic memories rely on successfully binding elements that are processed in separate, specialised brain regions. The formation of such memories is likely mediated by fast acting LTP, which may be orchestrated by neural oscillations, such as hippocampal theta. Information processing pathways converge in the hippocampus, where binding may take place; theta oscillations may act as the "gluing mechanism", providing the time windows for fast acting LTP and LTD. Employing a novel multisensory memory paradigm to control the degree of synchrony between auditory and visual cortices, we provide direct evidence of the causal role of theta-frequency-specific synchronicity for the formation of complex memory episodes in humans, showing greater recall for synchronous (v. asynchronous) stimulation.

**A-1057 Brain system for mental orientation**
Shahar Arzy
Department of Medical Neurosciences, Faculty of MEdicine, Hebrew University of Jerusalem, Israelrn2. Department of Neurology, Hadassah Hebrew University Medical Center, Jerusalem, Israel
Orientation is a fundamental mental function that processes the relations between the behaving self to space (places), time (events), and person (people). We used high-resolution functional-MRI as 16 subjects compared their subjective distance to different places, events, or people. Analysis at the individual-subject level revealed cortical activation related to orientation in space, time, and person in a precisely organized set of structures in the precuneus, inferior parietal, and medial frontal cortex. The default-network, identified in a separate resting-state scan, was active for all orientation domains and overlapped mostly with person-orientation regions. This suggests that mental-orientation in space, time, and person is managed by a specific brain system with a highly ordered internal organization, closely related to the default-network.

# The Ever-Changing Engram: Towards an Integrated Understanding of Long-Term Memory Dynamics

**S0038 (Psychonomic Society Collaborative Symposium) session**
Tuesday, 19 July 2016 | 15:30 - 17:30 | Room 1
**Chair/Organizer: Almut Hupbach**
**Discussant: Lynn Nadel**

**A-0466 Effects of memory reactivation during sleep and wakefulness: similar or different?**
Susanne Diekelmann
University of Tuebingen, Germany
Memories can not only become reactivated by retrieval or by reminders during wakefulness, but memory reactivation takes place spontaneously also during sleep, which can be triggered by reminder presentation. In a series of experiments, we show that the application of learning-associated odor cues during sleep resulted in an immediate stabilization of new memories, whereas similar odor reactivations in the wake state induced memory labilization. Functional magnetic resonance imaging revealed different activation patterns following reminder presentation during sleep and wakefulness. Moreover, different types of reminders (complete/incomplete) exerted different effects on memory during sleep and wakefulness. This evidence collectively suggests that reactivation has different effects on memory traces during wakefulness and sleep.

**A-0468 Facilitation, inhibition, & differentiation—oh my! Interleaved study & retrieval practice**
Justin Hulbert
Bard College, USA
Depending on the retrieval schedule, practiced items may be facilitated and competitors inhibited over extended delays (Anderson et al., 1994). However, as circumstances change, unpracticed competitors might once again become relevant. Interleaving restudy episodes and competitive retrieval practice can reverse retrieval-induced forgetting (Storm et al., 2008), offering a way out of this zero-sum trap. By synthesizing neural network models of competition-dependent learning (Norman et al., 2006; 2007), behavior, and multi-voxel pattern similarity analysis, I'll suggest that hippocampal differentiation helps resolve the competition. This approach to dynamically tracking the differentiation of hippocampal representations as a function of learning holds promise for better understanding how long-term memories are shaped, including how sleep replay might achieve similar effects for once confusable memories.

**A-0464 Long-term effects of directed forgetting: consolidating the important**
Almut Hupbach
Lehigh University, USA
Instructing people to forget some previously learned information makes this information difficult to recall in a subsequent memory test. This directed forgetting (DF) effect has been attributed to retrieval difficulties that are short-lived. I will present evidence that DF effects persist 24 hours after encoding. Additionally, it was tested whether this long-term effect is sleep-dependent by reducing the time delay between encoding and testing to 12 hours, which were either filled with sleep or wakefulness. Directed forgetting effects were more pronounced in the sleep condition. Taken together, these findings suggest that different mechanisms explain the short- and long-term effects of directed forgetting, with long-term effects reflecting a preferential consolidation of information that has been identified as important during encoding.

**A-0470 Putting an unpleasant past to rest: On forgetting and emotional health**
Simon Nørby
University of Aarhus, Denmark
I focus on the relation between forgetting and emotion and argue that selective forgetting of negative experiences or associated emotions is often part of emotion regulation. Specifically, I suggest that selective forgetting of negative memories helps form a mnemonic basis for an optimistic outlook and a hopeful worldview, among healthy people. Moreover, I suggest that some affective disorders such as depression and post-traumatic stress disorder, which are characterized by intrusions of negative memories and an abundance of unpleasant emotions, may at least in part result from and be maintained by a diminished capacity to forget. Overall, I argue that forgetting may help people to not be burdened by and stuck with bad memories.

**A-0816 The Role of Attention in Directed Forgetting**
Lili Sahakyan, Trisha Patel
University of Illinois at Urbana-Champaign
Directed forgetting demonstrates our capability of reducing access to unwanted information. In the standard paradigm, participants study two lists and are either told to remember or forget the first list. Research has identified several boundary conditions for obtaining directed forgetting with respect to the importance of List 2. Directed forgetting depends on whether there is List 2 encoding (e.g., Pastotter & Bauml, 2007), and whether attention is divided during List 2 encoding (e.g., Conway et al., 2000). We examined the role of attention by systematically manipulating whether attention is divided only during List 1, only during List 2, or during both lists. We also manipulated the nature of divided attention task. The results have implications directed forgetting theories.

**A-1045 Stress-induced changes in the formation and updating of memories**
Lars Schwabe
University of Hamburg, Germany
Although stress is well-known to modulate memory, fundamental questions are still unanswered. How do stress effects on memory formation develop? Can the laboratory findings on the impact of stress on memory be translated to natural environments? And may stress also alter the dynamics of already existing memories? I will present two recent experiments that directly addressed these questions. Results of these experiments showed (i) that stress increased memory for real-life events that were encoded under stress as well as about 30 minutes post-stress, which was directly linked to the activity of major stress response systems and (ii) that stress reduced the incorporation of (misleading) information into an established memory, suggesting that stress may change memory updating mechanisms.

**A-0469 Neural Mechanisms of visual perspective shifting during retrieval that modify autobiographical memories**

Peggy L. St. Jacques
University of Sussex, United Kingdom

One of the most striking examples of the dynamic nature of memories is the ability to recall the past from a visual perspective that was not originally experienced. We typically experience the world from a 1st person perspective, from our own eyes, but we can retrieve memories from a 3rd person perspective, as if from an observer viewpoint. In this talk I will discuss research that examines how shifting visual perspective from a dominant to an alternative vantage point during retrieval can modify autobiographical memories. I will provide evidence that updating egocentric perspectives during memory retrieval involves the manipulation of mental images in the precuneus, which leads to restructuring of online and subsequent memory representations.

# Neuromodulatory Effects on Episodic Memory

**S0035 session**
Tuesday, 19 July 2016 | 15:30 - 17:30 | Room 2
**Chair/Organizer: Matthias Gruber**

**A-0586 States of motivation prioritize learning and post-learning dynamics**
Matthias J. Gruber [1], Charan Ranganath [1,2]
[1] Center for Neuroscience, UC Davis, USA; [2] Department of Psychology, UC Davis, USA;
An adaptive memory system prioritizes salient over less salient information. Several studies have shown how rewards influence learning of specific stimuli, but little is known about how motivational states affect learning and retention. In a series of behavioral and fMRI studies, we will show evidence of how states of high motivation (e.g. via reward or curiosity) prioritizes learning and memory consolidation for motivationally relevant and incidental information. Our results show that the hippocampus plays a critical role in prioritizing retention of memories learned during states of high motivation both during encoding and during post-learning rest. The findings highlight the crucial role of how motivational states modulate learning and consolidation mechanisms.

**A-0321 The interactive effects of extrinsic rewards and curiosity on memory**
Kou Murayama
University of Reading, Reading, UK
Recent research has revealed that both extrinsic rewards and curiosity enhance memory consolidation, perhaps due to the dopaminergic input of the reward system into the hippocampal memory system. In this talk, I will present the behavioural evidence that supports this memory consolidation hypothesis, but also provide a nuanced view on how curiosity would interact with extrinsic rewards to influence memory performance. We propose that curiosity works as rewards, but this happens only when explicit incentives are not available.

**A-0463 The simple act of choice facilitates memory via enhanced valuation and engagement of value-related neural circuits.**
Vishnu Murty [1], Sarah DuBrow [2], Lila Davachi [3]
[1] University of Pittsburgh, Pittsburgh, PA, USA; [2] Princeton University, Princeton, NJ, USA; [3] New York University, New York City, NY, USA
The ability to make decisions fosters a sense of agency, a process that enhances valuation of selected items. Prior research shows that interactions amongst valuation and hippocampal systems can enhance memory, raising the possibility that valuation via perceived agency could similarly facilitate memory. We found that the opportunity to choose which information to encode enhanced recognition memory, and memory enhancements were related value-related processes. FMRI analysis revealed that choice-induced memory enhancements facilitated striatal-hippocampal interactions during encoding and striatal-ventromedial prefrontal cortex interactions post-encoding. Further, memory enhancements were stronger at a 24-hour delay, suggesting a putative role for value-related mechanisms of memory consolidation. Together, these findings support that perceived agency over learning via active choice facilitates better memory encoding.

**A-0319 Recent exposure to novelty shapes basic human memory processes.**
Katherine Duncan, Anuya Patil
University of Toronto, Toronto, Canada
Detecting novelty in one's environment triggers an array of neurochemical responses, each known to influence basic neural processes on the timescales of milliseconds to minutes. The consequences that these prolonged neurochemical states may have for human behavior, however, have only recently begun to be explored. Here, I will present a series of behavioral experiments in which we assess how recent exposure to novelty affects human memory. Each experiment is designed to test behavioral predictions that are grounded in the physiological effects of cholinergic modulation. Across studies, we find a pattern of facilitatory and encumbering effects of novelty on memory that is most parsimoniously explained by novelty evoking a bias toward pattern separation, while familiarity evokes a bias toward pattern completion.

**A-0394 Pain anticipation modulates the mesolimbic system, low beta power and event-related fields during memory encoding**
Eva M. Bauch [1], Nico Bunzeck [1,2]
[1] Department of Systems Neuroscience, University Medical Center Hamburg-Eppendorf, Martinistrasse 52, 20246 Hamburg, Germanyrn[2] Department of Psychology, University of Lübeck, Ratzeburger Allee 160, 23562 Lübeck, Germanyrn
Here, we investigated the neurobiological mechanisms of the anticipation of aversive events and its effects on long-term memory with functional magnetic resonance imaging (fMRI; study I) and magnetoencephalography (MEG; study II). Participants encoded a series of scene images, which was combined with cues predicting an electric shock with different probabilities (0.2, 0.5 or 0.8). After encoding, memory for the studied images was tested. Our results demonstrate that anticipating primary aversive events recruits the human mesolimbic system and differentially modulates declarative memory functions via medial temporal lobe structures. Furthermore, beta oscillations provide a generic mechanism underlying pain anticipation. As such, our findings give new and important insights into how aversive motivational states can drive memory formation.

**A-0743 Stress as a mnemonic filter: Interactions between MTL learning processes and post-encoding stress**
Maureen Ritchey [1,2], Andrew M. McCullough [1], Andrew P. Yonelinas [1], Charan Ranganath [1]
[1] University of California, Davis, USA; [2] Boston College, Boston, USA
Acute stress has been shown to increase retention of recently learned information via neurohormonal modulation of medial temporal lobe (MTL) consolidation processes. However, little is known about how post-encoding events interact with neural processes occurring during learning. In this study, we used fMRI to test the idea that the effects of stress on memory depend on prior MTL learning processes. We found that post-encoding stress hormone reactivity was associated with a shift toward recollecting events that had elicited strong relative to weak encoding activation. Surprisingly, this effect was larger for neutral, compared to emotionally negative, memories. The results suggest that stress does not uniformly enhance memory, but instead selectively preserves neutral memories tagged during encoding, acting as mnemonic filter.

**A-1027 Noradrenergic and dopaminergic systems interact to amplify motivated memory under threat**
David Clewett, Ringo Huang, Rico Velasco, Tae Ho Lee, Mara Mather
University of Southern California, Los Angeles, CA, USC
According to the Glutamate Amplifies Noradrenergic Effects (GANE) model (Mather et al., 2015), arousal-induced activation of the locus coeruleus-

norepinephrine (LC-NE) system, such as during threat, selectively enhances local activity in regions transmitting goal-relevant information, thereby enhancing memory for that information. We tested GANE using a monetary incentive encoding task in which participants prioritized a background scene while ignoring a transparent foreground object. Stimulus-evoked pupil dilation, a biomarker of LC activity, correlated more with successful scene memory in the threat-of-monetary loss condition than the neutral condition. Magnitude of pupil dilation also predicted successful scene encoding-related activity in the LC, parahippocampal gyrus, thalamus, and VTA/SN, suggesting that threat-induced LC-NE activity interacts with dopaminergic motivational brain systems to amplify encoding of goal-relevant information.

# Unitization: Learning new associations as a single coherent item

**S0031 session**

Tuesday, 19 July 2016 | 15:30 - 17:30 | Room 3

**Chair/Organizer: Axel Mecklinger, Christine Bastin**

**A-0303 The importance of unitization for familiarity-based learning**

Andrew P. Yonelinas [1], Colleen Parks [2]

[1] University of California, Davis, USA [2] University of Nevada, Las Vegas, USA

A growing body of research has shown that familiarity can support associative memory under conditions in which the components of an association are unitized (i.e., treated as a single coherent item). However, several fundamental questions about the nature of unitization remain. For example, does unitization reflect a specialized form of learning or is it simply a form of semantic or elaborative encoding? Moreover, can the beneficial effects of unitization on familiarity be observed for across-domain associations or are they limited to creating new associations between items that are from the same stimulus domains? Results are described indicating that unitization does reflect a specialized form of learning, and that it is particularly useful in supporting the learning of novel across-domain associations.

**A-0304 The impact of preexisting semantic integration on associative memory in normal aging**

Christin Bastin

University of Liège, Belgium

Aging is accompanied by a decline of associative memory. Given that unitization of associations increases familiarity-based memory and that familiarity is better preserved than recollection in aging, to promote unitization during encoding of associations may attenuate age-related differences in associative memory. In two aging experiments, unitization was favored by preexisting semantic integration (compound words and semantically-related word pairs). With the Remember/Know procedure, it was found that unitized associations induced more familiarity-based recognition memory than nonunitized associations, with no effect on recollection. However, unitization at encoding was not successful at attenuating the age-related associative memory decline. Older adults did not disproportionally benefit from semantic integration, possibly because of difficulties to control absolute familiarity of prior knowledge.

**A-0305 Unitization shapes associative episodic memory by increasing familiarity: Evidence from event-related potentials**

Axel Mecklinger, Regine Bader

Saarland University, Saarbrücken, Germany

A core feature of human memory is the ability to form and retrieve arbitrary associations. One way of forming new associations, called unitization, is to encode the components of an association in a way that they form a single representation in memory. Using event-related potentials (ERP) measures it was found that various strategies to promote unitization at encoding, including instructions by which two items can be combined to a new conceptual unit and bottom-up unitization guided by preexisting semantic and spatial knowledge do support associative memory mainly by increasing familiarity-based remembering. The ERP results further suggest that the low absolute familiarity of the newly formed unitized representations is highly diagnostic for associative memory decisions

**A-0308 Semantic unitizability modulates recognition memory context effects and their electrophysiological correlates**

Daniel A. Levy

Interdisciplinary Center Herzliya, Israel

Recognition memory context effects provide an implicit measure of associative strength between encoded stimuli, without requiring strategic associative retrieval. We investigated how semantic relatedness and spatial congruence, unitizing factors previously demonstrated to engender associative familiarity, modulate the behavioral parameters and electrophysiological correlates of context effects. Participants interactively encoded pairs of object pictures, spatially arranged in a configural relationship, with one pair member marked as the target for later retrieval. Half the pairs were related objects (e.g., lamp on table), readily perceived as a unit, and half were unrelated objects (e.g., key-ring on apple). Such “bottom-up” unitization led to stronger context reinstatement effects on item recognition in related pairs, and differential modulation of ERP components associated with familiarity and recollection.

**A-0312 Bypassing relational binding deficits in amnesia and aging through unitization**

Jennifer D. Ryan

University of Toronto, Canada

Older adults and individuals with amnesia due to damage to the hippocampus and extended system typically have deficits in establishing memories regarding the relations among distinct items. We have shown that a unitization strategy can circumvent hippocampal dysfunction and successfully support performance, in amnesic cases (developmental and adult-onset) and older adults. Unitization requires the individual to maintain online the fusion of items through an action whereby one item acts as an agent onto another. Unitization is likely comprised of multiple cognitive components (e.g., fusion, motion perception, comprehension of actions/consequences). When the directionality of a relation must be learned, fusion alone is insufficient; comprehension of action/consequence sequences is required to support performance

**A-0314 Episodic memory and unitization: Can theory-driven research have real-world impact?**

David Donaldson, Jamie G. Murray

Psychology, School of Natural Sciences, University of Stirling.UK

The vulnerability of episodic memory to decline with age and disease means that techniques able to improve memory performance are of huge practical significance. One approach is to encourage ‘unitization’ of multi-part stimuli during encoding – in the belief that this will lead to enhanced familiarity-based retrieval, countering losses in recollection-based remembering. Here we provide a brief review of evidence from a number of studies, including behavioural, neuropsychological and neuroimaging data. Taken together, findings highlight the strength of evidence for unitization as an effective approach to combatting memory decline. Findings also raise questions about the way memory is measured, the nature of the task manipulations employed, and the theoretical characterisations of episodic memory upon which unitization research is based.

**A-0310 How emotion affects associative unitization**

Elizabeth Kensinger

Boston College, USA

We sometimes unitize co-occurring items, experiencing and remembering them as parts of a whole. I will discuss three lines of evidence that emotion affects unitization processes. First, young adults can unitize a non-emotional item with an emotional item faster than with another non-emotional item at encoding, although the emotional unitizations are less likely to be retrieved in memory. Second, emotion interacts with time-pressure to influence older adults' ability to form and retrieve unitized associations. Third, unitization of emotional information relies more on sensory processes, and less on prefrontal and medial temporal-lobe processes, than unitization of non-emotional information. Together, these findings suggest that the route for forming and retrieving unitized associations depends upon emotional content.

## What's this chamber doing in my brain? The role of the thalamus in memory.

**S0060 session**
Tuesday, 19 July 2016 | 15:30 - 17:30 | Room 4
**Chair/Organizer: Lola Danet, Emmanuel Barbeau**

**A-0917 Retrograde Amnesia in the Korsakoff syndrome.**
Yvonne C.M. Rensen [1], Roy P.C. Kessels [1,2,3], Ellen M. Migo [4], Arie J. Wester [5], Paul A.T.M. Eling [1], Michael D. Kopelman [6]
[1] Radboud University, Donders Institute for Brain, Cognition, and Behavior , Nijmegen , The Netherlands [2] Korsakoff Clinic, Vincent van Gogh Institute, Centre of Excellence for Korsakoff and Alcohol-Related Cognitive Disorders , Venray , The Netherlands [3] Department of Medical Psychology , Radboud University Medical Center , Nijmegen , The Netherlands [4] King's College London, Institute of Psychiatry , Psychology and Neuroscience, London , UK [5] Centre of Excellence for Korsakoff and Alcohol-Related Cognitive Disorders, Vincent van Gogh Institute for Psychiatry, Venray, The Netherlands [6] Department of Psychological Medicine, Institute of Psychiatry , King's College London , London , UK
In both the Korsakoff syndrome and thalamic amnesia, damage to the anterior thalamus/mammillo-thalamic tract, part of the 'extended hippocampal circuitry', has most commonly been cited as the basis for anterograde amnesia, but damage to the medial-dorsal nuclei has also been advocated. There are relatively few studies of retrograde amnesia (RA) in thalamic amnesia, but RA is generally much more extensive (years or decades) in the Korsakoff syndrome, and this is generally attributed to the greater prevalence of frontal atrophy in Korsakoff cases. In a recent study, we have looked again at autobiographical memory in the Korsakoff syndrome, using two methods of assessment (the Autobiographical Memory Interview, the Autobiographical Interview). These produced near-identical results, and the theoretical implications will be discussed.

**A-0919 Alcohol-related brain dysfunction as a model to explore the thalamus**
Anne Lise Pitel, Shailendra Segobin, Ludivine Ritz, Francis Eustache, Hélène Beaunieux
Inserm-EPHE-Université de Caen/Normandie, UMRS-1077, Caen, France
Alcohol use disorder (AUD) encompasses different clinical forms from the 'uncomplicated' one to the Korsakoff's syndrome. The main difference between AUD with and without Korsakoff's syndrome is the severity of episodic memory deficits (amnesia only in Korsakoff patients) and associated shrinkage of the Papez circuit (mainly the thalamus). However, the two groups exhibit similar working memory impairments and shrinkage of the frontocerebellar circuit (except the thalamus). The thalamus being shared between these two brain networks, thalamic structural abnormalities in Korsakoff patients could explain the different neuropsychological profiles observed in these two clinical forms. Structural alterations within thalamic nuclear groups, white matter fibre disruptions within the networks and/or potential compensatory mechanisms will be discussed to explain this pattern of findings.

**A-0921 Variability of thalamic imaging phenotypes is associated with cognition, schizophrenia and genetics**
Giulio Pergola [1], Boris Suchan [2], Alessandro Bertolino [1,3], Giuseppe Blasi [1,2,3]
[1] Department of Basic Medical Science, Neuroscience, and Sense Organs – University of Bari 'Aldo Moro', Piazza Giulio Cesare 11, 70124 Bari, Italy; [2] Department of Neuropsychology, Institute of Cognitive Neuroscience – Ruhr University Bochum, Universitaetsstr. 150, 44801 Bochum, Germany [3] Psychiatry Unit - Bari University Hospital, Piazza Giulio Cesare 11, 70124 Bari, Italy; [4] IRCCS "Casa Sollievo della Sofferenza", Viale Cappuccini, 1, I-71013 San Giovanni Rotondo, Italy.
Neurological and imaging findings indicate that specialized thalamo-cortical networks underlie high-order cognitive functions. These networks are altered in patients with schizophrenia, who also show deficits in memory and executive function. However, it is unclear whether thalamic nuclei per se are involved in cognition and in schizophrenia or whether their role is ancillary to cortical function. We integrated clinical, structural/functional imaging, and genetic data to study how inter-individual variability in thalamic structure and function is associated with cognitive performance and with schizophrenia. Thalamic grey matter, activity, and connectivity co-vary with memory performance, executive function deficits, and risk for schizophrenia. The genetic background of the imaging features studied suggests that the thalamus is key to cognition and to schizophrenia pathophysiology.

**A-0922 Impact of thalamic lesions on episodic memory in Alzheimer's disease and frontotemporal dementia**
Michael Hornberger
Norwich Medical School, University of East Anglia
In the proposed talk I will present thalamic lesions and episodic memory data in Alzheimer's disease (AD) and frontotemporal dementia patients (FTD). The data presented will demonstrate that despite hippocampal atrophy being quite prevalent across AD and FTD subtypes, anterior thalamic regions are particularly affected in FTD subtypes, in particular those with underlying TDP-43 pathophysiology. However, more subtle thalamic changes can be observed in AD, even at prodromal disease stages. Importantly, anterior thalamic changes can have varying impact on episodic memory performance in the patients, which will be discussed. Overall, the findings highlight that a hippocampal-centric view of episodic memory problems in neurodegeneration might overlook the impact of thalamic contributions to the symptomology in these patients.

**A-0925 Thalamic Contributions to Long-term Memory Retrieval**
Sicong Tu [1,2,3], Muireann Irish [1,2,4], Laurie Miller [2,5], Michael Hornberger [2,6]
[1] Neuroscience Research Australia, Randwick, Sydney, Australia [2] Australian Research Council Centre of Excellence in Cognition and its Disorders, Sydney, Australia [3] School of Medical Sciences, The University of New South Wales, Sydney, Australia [4] School of Psychology, The University of New South Wales, Sydney, Australia [5] Central Clinical School, Neuropsychology Unit, Royal Prince Alfred Hospital, University of Sydney Sydney, NSW, Australia [6] Norwich Medical School, University of East Anglia, Norwich, United Kingdom
Stroke patients with focal damage to the thalamus show a selective impairment to anterograde memory on delayed recall on neuropsychological tests. The extent of this impairment over the long-term (i.e. > 24 hrs) remains poorly characterised. The current studies addressed this by: i) assessing dependence of memory retrieval on limbic memory structures in healthy individuals using a novel online assessment of long-term memory and functional MRI, and ii) assessing a group of thalamic stroke patients on their long-term memory retention. We found that patients showed accelerated forgetting after a 24 hour delay which may represent a disruption of hippocampal-cortical pathways in the memory consolidation process.

**A-0927 Comparative visual memory processing after medial thalamic damage in humans and non-human primates**
Anna S. Mitchell [1], Sicong Tu [2,3,4], Michael Hornberger [3,5], Laurie Miller [3,6]

[1] Department of Experimental Psychology, University of Oxford, Oxford, UK [2] Neuroscience Research Australia, Randwick, Sydney, Australia [3] Australian Research Council Centre of Excellence in Cognition and its Disorders, Sydney, Australia [4] School of Medical Sciences, The University of New South Wales, Sydney, Australia [5] Norwich Medical School, University of East Anglia, Norwich, United Kingdom [6] Central Clinical School, Neuropsychology Unit, Royal Prince Alfred Hospital, University of Sydney Sydney, NSW, Australia

Animal models of diencephalic amnesia have pinpointed several critical structures involved in memory processing. In the current study, patients with thalamic stroke damage were assessed on several memory tests including learning object-in-place scene discriminations, a task originally designed to assess learning and memory function in non-human primates. Structural MRI scans confirmed that our patients had damage to the mediodorsal thalamus, while the mammillothalamic tract remained intact. Patients were impaired in new learning of the object-in-place scene discriminations when compared to healthy age and IQ-matched controls. Comparative learning and memory deficits occur in non-human primates with selective damage to the mediodorsal thalamus. These findings highlight the similarity of deficits across humans and non-human primates in this object-in-place scene discrimination test.

**A-0928 Recollection and familiarity in the human thalamus**

Giovanni A. Carlesimo [1,2]

[1] Tor Vergata University, Systems Medicine Department, Rome, Italy [2] Laboratory of Clinical and Behavioural Neurology, IRCCS Santa Lucia Foundation, Rome, Italy

According to the dual-process theory, the memory processes that underlie recollection and familiarity are qualitatively different and underlain by distinct neural substrates. Thus far, research has focused on distinct regions of the MTL as implicated mostly in recollection (hippocampus) or familiarity (perirhinal cortex). Aggleton and Brown (1999) suggested extending the neuroanatomical distinction to other cortical and subcortical areas of the brain, including the thalamus where the anterior thalamic nuclei would be mainly implicated in recollection whereas the magnocellular portion of the mediodorsal nucleus would be responsible of the familiarity processes. In the present talk, neuropsychological evidence in brain-damaged individuals and functional neuroimaging evidence in healthy humans that supports Aggleton and Brown's model at the level of thalamus will be reviewed.

**A-0929 Medial thalamic stroke and its impact on familiarity and recollection**

Lola Danet [1,2], Jérémie Pariente [1,3], Pierre Eustache [1], Nicolas Raposo [3], Igor Sibon [4], Jean-François Albucher [3], Fabrice Bonneville [1,3], Patrice Peran [1], Emmanuel J. Barbeau [2]

[1] Toulouse NeuroImaging Center, Université de Toulouse, Inserm, UPS, France [2] Université de Toulouse, Centre de recherche Cerveau et Cognition (CNRS, CerCO, UMR 5549), Toulouse, France [3] Neuroscience Centre, Purpan Hospital, Toulouse University Hospital, Toulouse, France [4] Department of Diagnostic and Therapeutic Neuroimaging, University of Bordeaux Victor Segalen, Bordeaux University Hospital, France

The recognition memory model proposed by Aggleton et al., (2011) hypothesizes that the mammillothalamic tract (MTT) / anterior thalamic nucleus (AN) complex is critical for recollection, while the mediodorsal nucleus (MD) plays a direct role in familiarity and an indirect role in recollection. 12 patients with left thalamic stroke and 25 controls underwent three recognition memory tasks and high-resolution MRI scan. Patients showed impaired recollection but spared familiarity. No patient had significant AN lesion. Patients with isolated damaged to MD exhibited impaired recollection but preserved familiarity. Patients with damaged MTT had lower recognition indices, including familiarity. These results suggest that models of familiarity, which assign a critical role to the MD, should be reappraised.

# Retrieval mechanisms in autobiographical memory

**S0042 session**

Tuesday, 19 July 2016 | 15:30 - 17:30 | Room 5

**Chair/Organizer: Søren R. Staugaard, Lynn A. Watson**

**A-0432 Switch-costs in the self-memory system**

Clare J. Rathbone [1], Chris Moulin [2]

[1] Oxford Brookes University, United Kingdom; [2] Université Pierre-Mendès-France, France

Two studies examined the idea that the working self operates as an executive structure in the generation of autobiographical memories. A switching task was used, in which participants completed an autobiographical memory fluency task, either using alternating self-image cues or the same cue repeatedly. There was a clear switch cost, whereby participants took longer to generate autobiographical memories when alternating between two different self-images. These experiments support the idea that autobiographical memories are organized into a hierarchical structure, which can be probed using executive function-like tasks. In particular, the task switch cost points to retrieval systems being geared up to retrieving memories according to the current goals of the self.

**A-0433 A shortcut to the past: Object-cued autobiographical memory recall in Alzheimer's disease**

Marie Kirk, Dorthe Berntsen

Aarhus University, Denmark

The present study examines whether is it possible to optimize autobiographical memory recall in Alzheimer's disease patients by manipulating the sensory richness and concreteness of the memory cues (objects versus their verbal referents) at the time of retrieval. Results demonstrate that Alzheimer's disease patients retrieve significantly more memories in response to object-cued recall, as opposed to word-cued recall, and that these memories score significantly higher in terms of autobiographical content. Results furthermore show increased recollection of memories from within the time of the reminiscence bump. Overall, results suggest that strong and distinctive environmental cueing diminishes the impact of cognitive dysfunction on autobiographical memory retrieval in Alzheimer's disease.

**A-0434 Effects of diary type (paper vs. smartphone) and study length (1 vs. 7 days) on the number of recorded involuntary autobiographical memories**

Andrew Laughland, Lia Kvavilashvili

University of Hertfordshire, United Kingdom

Involuntary Autobiographical Memories (IAMs) have typically been studied with paper diaries, kept over several days. Two studies examined the use of an electronic diary installed on participants' own smartphones, and compared the number and qualities of recorded IAMs to memories recorded in standard paper diaries. In the two studies, using 7- and 1-day diaries, respectively, more memories were recorded in paper than smartphone-diaries despite higher compliance rates with carrying a smartphone diary. The effectiveness of recording IAMs on participants' own smartphones and the most appropriate recording period (1- vs. 7-days) will be discussed.

**A-0435 The frequency and cueing mechanisms of involuntary memories while driving: A novel audio-recording method in situ**

Andrew Laughland

University of Hertfordshire, United Kingdom

Participants often anticipate low frequencies of Involuntary Autobiographical Memories (IAMs), and early research initially reported only 2-3 IAMs per day. IAMs have been studied by diary methods, and more recently, laboratory methods. Over time, greater IAM frequencies have been reported when reducing the diary-recording burden (shorter questionnaires, simplifying the process, e.g., clicking a counter), or the monitoring period (e.g., in laboratory studies). In this novel, single-participant study, a participant audio-recorded IAMs in 20 identical car journeys. IAMs occurred at one per minute, from internal, external or no cues. External cues were further assessed as either always present in the journey, or transient. Audio playback allowed identification of chaining and other phenomena not often apparent with traditional methods, and is discussed.

**A-0436 High frequency involuntary remembering and the control of attention**

John H. Mace, Fayeza S. Ahmed

Eastern Illinois University, USA

Involuntary autobiographical memories are spontaneous recollections of the past that occur normally in everyday cognition. While most individuals have only a few of these memories per day (e.g., 3-5), some have an inordinate amount daily (e.g., 50-70). Previous research (Verwoerd & Wessel, 2007) has suggested a link between high levels of involuntary remembering and attentional deficits. This study further investigated the role of attention in high frequency involuntary remembering. We examined the cognitive characteristics of individuals who experience large numbers of involuntary memories daily. In the main, we were interested in determining which type of attentional deficit best described these individuals, and if there was a subset of individuals who could not be characterized as having attentional deficits.

**A-0437 Retrieval intentionality - does it really matter?**

Krystian Barzykowski [1], Søren R. Staugaard [2]

[1] Jagiellonian University, Poland; [2] Aarhus University, Denmark

Theories of autobiographical memory distinguish between involuntary and voluntary retrieval as a consequence of conscious intention. Another distinction can be made between direct and generative retrieval, which reflects the effort involved. More recent theoretical advances suggest that they are separate types of retrieval, one unintentional (involuntary), another intentional and effortless (direct voluntary retrieval), and a third intentional and effortful (generative voluntary retrieval). Whether this also entails differing phenomenological characteristics (vividness, rehearsal, emotional valence) has not been investigated. In the current study, participants reported memories in an experimental paradigm designed to elicit voluntary and involuntary memories and rated them on a number of characteristics. Our results imply that retrieval intention seems to differentiate how a memory appears in a person's mind.

**A-0438 Voluntary and involuntary memories for emotional pictures**

Lynn A. Watson, Julie A. Niziurski, Adriana del Palacio Gonzalez, Dorthe Berntsen

Aarhus University, Denmark

The aim of the study was to investigate memory processes associated with the retrieval of emotional picture stimuli both voluntarily and involuntarily. Non-clinical participants were shown positive, negative and neutral images and asked to record their reactions to these images during encoding. In the following 5 days, participants recorded instances of involuntary and voluntary memory retrieval and associated emotional and physical reactions in a diary. Preliminary findings indicate differences in the emotional reactions to, and self-relevance of pictures retrieved involuntarily relative to those retrieved voluntarily. Findings will be discussed both in terms of clinical theories of intrusive memory and basic cognitive models of autobiographical memory.

**A-0439 Rate of forgetting in voluntary and involuntary episodic memory**

Søren R. Staugaard, Dorthe Berntsen
Aarhus University, Denmark

Memory accuracy can be defined as the forgetting of information over time and is influenced by interference. Voluntary remembering entails monitoring processes that are not assumed to be involved in involuntary remembering. This could leave voluntary remembering more vulnerable to interference and thereby forgetting. On the other hand, voluntary remembering could be resistant to forgetting due to elaboration. We tested these hypotheses in an experimental paradigm where participants were divided into four groups based on the retention interval between encoding and retrieval. While data collection is not completed, preliminary data seems to show that the rate of forgetting is equal in the two conditions, indicating that similar mechanisms operate on the two types of memory.

# Fact and Fiction: Remembering and Emotion in the Lab and the Courtroom

**S0004 session**

Tuesday, 19 July 2016 | 15:30 - 17:30 | Room 6

**Chair/Organizer: Mark L. Howe, Lauren M. Knott, Martin A. Conway**

**Discussant: Martin A. Conway**

**A-0022 The Persistence of Emotionally Negative False Memories: Lessons from the Lab**

Lauren Knott, Mark L. Howe, Samantha Wilkinson

City University London, London, UK

In forensic contexts, inaccurate recollection of events can lead to unsafe convictions. We present two experiments from the laboratory that attempt to examine factors that influence the way people falsely remember emotionally relevant information. In Experiment 1 we followed well-established paradigms from the memory and emotion research to examine persistent false memories for information that is congruent and incongruent with negative emotion. In Experiment 2 we examined the fundamental role sleep plays in the consolidation of emotional memories and the suggestion that such consolidation preferentially occurs during sleep. We discuss how emotions and delayed intervals influence the formation of false memories.

**A-0023 Discrete Emotion-congruent False Memories**

Cassandra Bland, Mark L. Howe, Lauren Knott

City University London, London, UK

False memories have been shown to increase for material where the emotional content is similar to that of the general mood of the person at the time of encoding. Rather than use a nonspecific negative mood induction, we induced fear and anger and examined whether mood congruency effects were found for false memories using the DRM paradigm. Results confirmed our prediction that congruency effects occur for specific negative emotions. Moreover, we demonstrate that research focussing only on arousal and valence is limited, as these two dimensions alone could not account for our results.

**A-0024 Presentation Mode Survives the Emotional Witness Effect**

Annika Melinder, Ellen Wessel, Lisa Burrell, Maria Olaussen Eriksen

University of Oslo, Oslo, Norway

The emotional witness effect constitutes a possible source of wrongful decisions in the legal decision making process. One view of an abused child is that (s)he should be sad when talking about the abuse. This raises the question of whether there is an optimal mode of presentation of a witness's testimony that could reduce possible influence from displayed emotions. Mock police interviews were reconstructed with child actors, role-playing the victims of physical abuse. Laypersons (n = 465) were presented with the interviews as transcripts with the emotional reactions of the child witness noted, audio-recorded versions, or as videotapes, and rated thereafter the witnesses' credibility. The "sad" expression elicited the highest credibility ratings, with the transcript versions rated highest.

**A-0025 Beliefs About Memory for Sexual Assault and Their Consequences: The Case of Rape**

Martin A. Conway, Katrin Hohl

City Uninversity London, London, UK

We describe several studies, some in progress, that examine beliefs about memory in law agency groups and in the general public. We show how these beliefs may lower prosecution rates or raise them, in both cases incorrectly. According to our analysis the attrition rate in allegations of rape (currently at an astonishing 93% in the UK) may arise in important ways from incorrect beliefs about the nature of memory.

**A-0026 A Longitudinal Study of Children´s Memories of a Stressful Separation from Biological Parents.**

Annika Melinder [1], Gunn Astrid Baugerud [1], Gail S. Goodman [2], Kristianne Stigsdatter Ovensrad [1]

[1] University of Oslo, Oslo, Norway [2] University of California -- Davis, Davis CA, USA

Retrospective reports of experiences are not always reliable because post event information and normal forgetting influence memory processes, making the reports less understandable. At times, there are witnesses to the scenarios leaving evidence behind for comprehensive knowledge about the event to be remembered that can be used by memory scientists. In this longitudinal study, we compare such observations of a stressful removal made by a researcher, with the victims' own reports about the same removal. Further, individual factors (e.g., parents' attachment, child age) are examined. We predict that a fair amount of information will be correct, but less consistent btw sessions. Age differences are expected, as well as less correct information from children having parents with an insecure attachment.

**A-0027 Long-Term Memory in Children Exposed to Violence: Part 1**

Gail S. Goodman [1], Deborah Goldfarb [1], Rakel P. Larson [1], Sarah Tashjian [2], Alexandra Shelley [1]

[1] University of California -- Davis, Davis CA, USA [2] University of California -- Los Angeles, Los Angeles CA, USA

As part of a longitudinal study of trauma and memory, our research examines adults' memories of childhood events. We have detailed data on experiences of a large number of children who, between the ages of 3- to 17-years-old, had been involved in forensic investigations for alleged child maltreatment (Wave 1). Part 1 of our presentation will concentrate on the child victims' memory about those experiences now 20 years later in adulthood (Wave 2). First, we will describe the Wave 1 study. We will then present data on the Wave 2 sample's memory for a subset of the events documented from childhood. Implications for an understanding of long-term memory in children exposed to violence will be addressed.

**A-0028 Long-Term Memory in Children Exposed to Violence: Part 2**

Gail S. Goodman, Deborah Goldfarb, Rakel P. Larson, Anyonia Cartwright, Alejandra Gonzalez

University of California -- Davis, Davis CA, USA

Adults exposed as children to violence may be interviewed, after a delay of many years, about the childhood events they experienced or witnessed. Part 2 of our report of a longitudinal study of trauma and memory focuses on adults' suggestibility about childhood experiences. Based on the detailed data we possess on 3- to 17-year-old children who had been involved in forensic investigations for alleged child maltreatment (Wave 1), we will concentrate in Part 2 of our talk on their suggestibility about those experiences now 20 years later (Wave 2). Specifically, we will describe Wave 1 and 2 predictors of the suggestibility of the adults' memory reports. Implications for adults' eyewitness memory after long delays will be discussed.

# Interactions between memory representation and control: Mechanisms and age-related differences

**S0025 session**
Tuesday, 19 July 2016 | 15:30 - 17:30 | Room 7
**Chair/Organizer: Yee Lee Shing, Yana Fandakova**
**Discussant: Roberto Cabeza**

**A-1007 Memory representations in the cortex: Episodic and semantic components**
Roberto Cabeza, Erik Wing, Simon Davis
Center for Cognitive Neuroscience, Duke University, Durham, USA
The standard memory model assumes that cortical regions store episodic memory traces while the hippocampus store pointers to these regions. Access to hippocampal pointers allows the reactivation of cortical regions and the recovery of memory traces. Using representational similarity analyses (RSA), we found that, consistent with the model, successful scene memory was associated with greater encoding-retrieval similarity and stronger hippocampal interactions in visual cortex. The results suggest that retrosplenial cortex stores abstract scene information, including the categories of individual object. Object representations are also stored along the ventral pathway, with posterior and anterior regions predicting subsequent memory for perceptual and conceptual information, respectively. Our studies illustrate the power of RSA for elucidating the nature of cortical memory representations.

**A-0682 Age-related declines in memory reflect both representational specificity and retrieval control processes**
Ali Trelle[1], Jon Simons[1], Richard Henson[2]
[1] Department of Psychology, University of Cambridge, UK [2] MRC Cognition & Brain Sciences Unit, Cambridge, UK
We compared performance of young and older groups on Yes/No (YN) and 2-alternative Forced Choice (FC) formats of a recognition memory test for visual objects and similar lures. In Experiments 1-2, older adults showed reduced performance when retrieval demands were reduced in FC, suggesting age-related decline in memory representations, but still showed a deficit in YN, even when concurrent FC performance was matched, suggesting additional decline in retrieval processes. In an fMRI experiment, stimulus representations in older adults showed reduced specificity, in terms of multi-voxel similarity, as well as reduced similarity between encoding and retrieval trials, suggesting difficulties in reinstantiating stimulus representations. Together, these experiments support the claim of distinct age-related deficits in memory representations and memory control processes.

**A-0669 False memory in old age: Effects of representation quality and retrieval monitoring mechanisms**
Yana Fandakova [1,2], Myriam C. Sander [1], Thomas H. Grandy [1], Markus Werkle-Bergner [1], Yee Lee Shing [1,3]
[1] Max Planck Institute for Human Development, Berlin, Germanyrn[2] University of California, Davis & Berkeley, USArn[3] University of Stirling, Scotlandrn
Older adults (OA) are more likely than younger adults (YA) to remember episodes that are in part or entirely false. Using structural and functional MRI, we examined the extent to which age differences in false memory depend on the quality of memory representations and the engagement of monitoring processes at retrieval. False recognition of recombined features drawn from low-quality word-scene pairs was similar between YA (N=30) and OA (N=44), but OA showed higher false recognition than YA on the recombined features drawn from high-quality pairs. False recognition in OA was predicted by dentate gyrus volume and cingulo-opercular activity associated with monitoring processes at retrieval. Taken together, binding and monitoring mechanisms make complementary contributions to false memory in later adulthood.

**A-0637 Aging affects how cognitive control resolves proactive interference in associative memory retrieval**
Audrey Duarte, Michael Dulas
School of Psychology, Georgia Institute of Technology, Atlanta, Georgia, USA
The present fMRI study investigated whether age-related changes in dissociable cognitive control processes underlie deficits in overcoming proactive interference during associative memory retrieval.In a paired associate memory task, participants chose which associate, a face or scene, objects were most recently paired with during study. As interference increased, memory performance decreased similarly across groups, with slight associative memory deficits in older adults. Across groups, left mid-VLPFC activity was sensitive to interference but did not distinguish correct from incorrect associative memory responses. By contrast, the DLPFC and anterior PFC distinguished correct from incorrect memory trials for young adults only. These results suggest that control processes that detect mnemonic interference but not those that resolve interference directly may be spared by age.

**A-0846 Proactive Control of Recollection in Young and Older Adults**
Alexa M. Morcom, Jessica Keating, Caitlin Affleck-Brodie, Ronny Wiegand
Psychology, University of Edinburgh
Difficulties with cognitive control are thought to underlie many of older adults' memory difficulties. Impairment in goal-directed proactive control may reduce ability to control recollection before it occurs. Here, we used electroencephalographic event-related potentials (ERPs) to investigate the impact of age and individual differences in working memory capacity (WMC). Targets in a recognition exclusion task were words encoded using two alternative decisions. Replicating earlier studies, young adults with higher WMC showed greater recollection selectivity, measured as the difference between parietal old/new effects for targets and non-targets. The young differed from older adults who showed nonselective recollection and reduced WMC. The data suggest that proactive control of retrieval is less effective in ageing.

**A-0254 Retrieval control strategies for evading forensic memory detection**
Zara Bergström [1], Xiaoqing Hu [2]
[1] University of Kent, UK [2] University of Texas, USA
Forensic memory detection aims to determine whether suspects have incriminating knowledge stored in their brain. A guilty suspect is expected to know specific details of the crime and reveal these memories through automatically elicited physiological/brain activity or behaviour in response to crime reminders. However, guilty suspects may be able to avoid detection by using retrieval control strategies to prevent incriminating memories from coming to mind. Suspects may suppress crime memories, which can inhibit underlying representations and reduce memories' automatic influences. Alternatively, suspects may generate a fake alibi, which may also prevent retrieval of the original veridical memory through interference

or inhibition. I will present research investigating retrieval control strategies and their underlying mechanisms in memory detection settings.

**A-0707 Strolling in a parking lot with my best friend: vmPFC mediates simulation-induced attitude changes**

Roland G Benoit [1,2], Daniel L Schacter [2]
[1] Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany [2] Department of Psychology and Center for Brain Science, Harvard University, Cambridge, MA, USA

The ventromedial prefrontal cortex (vmPFC) supports simulations of hypothetical episodes by integrating representations of an event's elements (e.g., its place and featured people). We demonstrate that such simulations, in turn, can change our attitudes towards these very elements via processes supported by vmPFC. Participants imagined meeting liked or disliked people at initially neutral, though familiar, places. Their attitude towards a place changed with the affective value of the paired person. Activation within vmPFC coded for the identity of the elements, scaled with the person's value, and predicted changes in attitude towards the place. The vmPFC may thus mediate simulation-induced attitude-change by transferring affective value between representations.

# Neuroscience of memory II

**I122 session**
Tuesday, 19 July 2016 | 15:30 - 17:30 | Room 8
**Chair/Organizer: Carl J. Hodgetts**

**A-0507 Evidence for a perception memory continuum: an EEG study in a healthy population**
Rebecca Ovalle Fresa, Nicolas Rothen
Institute of Psychology, Center for Cognition, Learning and Memory, University of Bern, Bern, Switzerland
In line with current memory theories of a perception-memory continuum along the ventral visual pathway, there is evidence that the specific profile of enhanced memory in special populations (e.g. synaesthesia) is based on increased perceptual sensitivity. The main goal of this study was to test in a more general population, if increased perceptual sensitivity is indeed associated with enhanced memory performance. We measured ERPs in response to simple perceptual stimuli biasing either the ventral or the dorsal route and established if perceptual sensitivity in response to ventrally (but not dorsally) processed stimuli is associated with visual short term memory performance in a change detection task. Preliminary results confirm the hypothesis and strengthen the assumption of a perceptual-memory-continuum.

**A-0532 Spectral fingerprints of memory encoding: material-specific and material-unspecific subsequent memory effects**
Marie-Christin Fellner [1], Stephanie Gollwitzer [2], Stefan Rampp [2], Nikolai Axmacher [1], Hajo Hamer [2], Simon Hanslmayr [3]
[1] Institute of Cognitive Neuroscience, Ruhr University Bochum, Germany [2] Epilepsy Center, Department of Neurology, Universitätsklinikum Erlangen, Erlangen, Germany [3] School of Psychology, University of Birmingham, UK
Subsequent memory effects (SME) reflect material specific cortical information processing and material unspecific memory encoding mechanisms. To disentangle these processes, we contrasted SMEs between words and faces in MEG and iEEG. Alpha/beta power decreases (~10-20Hz) in widespread cortical networks tracked successful encoding of words, presumably reflecting semantic processing. Processing perceptual features during encoding of unfamiliar faces, was related to gamma power increases (~40-80Hz) in face-specific areas. Memory encoding, irrespective of material, elicited decreases in theta power (~3-7Hz). These results imply that iEEG/MEG power in different frequency bands reflects spectral fingerprints of dissociable memory processes: alpha/beta decreases and gamma increases indexing material specific processes, theta decreases reflecting material unspecific memory encoding.

**A-0548 Atrophy of amygdala and abnormal memory-related alpha oscillations over posterior cingulate predict conversion to Alzheimer's disease**
Laura Prieto del Val, Jose L. Cantero, Mercedes Atienza
Laboratory of Functional Neuroscience, CIBERNED (Network Center for Biomedical Research in Neurodegenerative Diseases), Pablo de Olavide University, Seville, Spain.
Abnormal EEG oscillations are associated with memory deficits in mild cognitive impairment of amnestic type (aMCI). Here, we evaluated whether EEG oscillations during encoding/retrieval of associative memories together with atrophy of medial temporal lobe (MTL) structures were predictive of conversion to AD in aMCI. The aMCI-converter group (N=16) showed poorer associative memory, greater MTL atrophy, and lower capacity to recruit alpha oscillatory cortical networks than healthy older (HO) adults (N=26) and stable aMCI (N=18). Encoding-induced abnormal alpha desynchronization over the left posterior cingulate combined with atrophy of the right amygdala showed the best accuracy (80.9%) in predicting progression to Alzheimer's disease (AD). These results support that memory-related EEG oscillations enhance the predictive value of classical MRI biomarkers of AD.

**A-0600 The role of the fornix and inferior longitudinal fasciculus in contextual and conceptual autobiographical memory**
Carl J. Hodgetts [1,2], Mark Postans [1,2], Naomi Warne [1,2], Alice Varnava [1,2], Andrew D. Lawrence [1,2], Kim S. Graham [1,2]
[1] School of Psychology, Cardiff University, Cardiff, UK; [2] Cardiff University Brain Research Imaging Centre, School of Psychology, Cardiff University, Cardiff, UK
While neuropsychological evidence highlights a role for the hippocampus and anterior temporal lobe (ATL) in episodic and semantic autobiographical memory (AM), respectively, it is unclear whether these constitute dissociable large-scale AM networks. We used diffusion-weighted imaging to assess white matter microstructure in participants who were asked to relive and recall past experiences using word cues. Inter-individual variation in the microstructure of the fornix (the main hippocampal input/output pathway) related to the amount of episodic, but not semantic, detail in AMs. Conversely, microstructure of the inferior longitudinal fasciculus, linking occipitotemporal regions with ATL, correlated with semantic, but not episodic, AMs. This striking double dissociation supports the view that dissociable, interacting, large-scale distributed brain networks underpin context and concepts in autobiographical memory.

**A-0605 Event related activations suggest distinct neural mechanisms for processing learned and new meaningless stimuli.**
Jayalakshmi Viswanathan [1,2], Florence Rémy [1,2], Nadège Bacon-Macé [1,2], Isabelle Berry [2,3], Simon Thorpe [1,2]
[1] CerCo, CNRS UMR 5549, CNRS, Toulouse, France. [2] University of Toulouse III - Paul Sabatier, Toulouse, France. [3] Toulouse NeuroImaging Center, Inserm, Toulouse, France.
We explored neural correlates of memory for meaningless stimuli. When a segment of noise is heard repeatedly (cyclically), participants extract features from this segment. In an implicit learning task, participants (n=15) differentiated cyclic from plain noise segments. A few of the cyclic noises were presented several times and retention of these implicitly-learned noises was tested 4 weeks later in a combined EEG and fMRI experiment. Temporal and spectral analysis of EEG data revealed several differences in the ERP and Event Related Spectral Perturbation (ERSP) components of old and new sounds, which suggests that their respective neural sources are distinct. This is in line with fMRI results showing new and old sounds are processed in different nuclei along the auditory pathway.

**A-0609 A Neural Similarity Code In The Anterior Temporal Pole Predicts False Memories**
Martin Chadwick [1,2], Raeesa Anjum [2], Dharshan Kumaran [1], Dan Schacter [3,4], Hugo Spiers [2], Demis Hassabis [1]
[1] Google DeepMind, London, UK [2] Institute of Behavioural Neuroscience, Department of Experimental Psychology, Division of Psychology and Language Sciences, University College London, London, UK [3] Department of Psychology, Harvard University, Cambridge, MA, USA [4] Centre for Brain Science, Harvard University, Cambridge, MA, USA
Conceptual or semantic representations allow us to make sense of the world around us. Whilst evidence from patients with semantic dementia

highlights the importance of the temporal pole in organizing semantic knowledge, how this information is represented remains an open question. Here we leverage a classic false memory paradigm whereby individuals exhibit illusory memory for semantically related concepts, together with multivariate fMRI techniques, to demonstrate that concepts are represented through a similarity-based code in the temporal pole. We further show that inter-individual variations in the representational space of concepts in the temporal pole predict subject-specific false memories. Our findings reveal the underlying structure of neural representations of semantic knowledge, and how this semantic structure can distort our memories.

**A-0617 How oscillations depict episodic memory formation in the real world**

Benjamin Griffiths[1], Ali Mazaheri [1], Stefan Debener [2], Simon Hanslmayr [1]
[1] University of Birmingham, UK; [2] Carl von Ossietzky University, Oldenburg, Germany

Despite the well-known influence of context on episodic memory, little has been done to embrace the contextual richness present in real-world experiments. Here, we asked EEG-equipped participants to encode verbal stimuli outside. Replicating lab-based findings, we identified significant low-frequency power decreases accompanying successful memory formation, including beta power decreases over the left inferior frontal gyrus. When investigating the relative influence of spatial and temporal context, spatial clustering exhibited significantly greater theta power decreases within the left medial temporal lobe in contrast to temporal clustering. While these findings support the ecological validity of lab-based paradigms, they also demonstrate that factors elusive in the lab (i.e. spatial context) have a profound effect on episodic memory and oscillations. Keywords: oscillations, context, mobile EEG

**A-0634 Brain oscillatory dynamics of attention allocation to item-context binding in episodic long-term memory**

Tamas Minarik, Barbara Berger, Paul Sauseng
Ludwig-Maximilians University, Munich, Germany

The allocation of attention to relevant information represents a critical component of working memory and long-term memory (LTM) processes. In order to successfully form episodic memories different sorts of information need to be processed in relation to each other and/or their context. To investigate the neural oscillatory dynamics of such item-item/item-context binding we designed two EEG experiments where participants memorized a picture and/or a word. Importantly, the emphasis was on either encoding picture and word separately, or on their simultaneous representation (i.e. their connection). We found that manipulation of encoding instruction leads to distinct brain oscillatory activations in prefrontal and temporal areas. This differential pattern is evident in slow and fast frequency bands locally and in inter-regional synchronization/communication.

# Keynote session V

**K5 session**

Tuesday, 19 July 2016 | 17:40 - 18:25 | Room 1

**Chair/Organizer: Fiona Gabbert**

**A-1073 KEYNOTE LECTURE: Building blocks of episodic memory: A neurodevelopmental account**

Simona Ghetti

University of California, Davis

In this talk, I will discuss the neurocognitive mechanisms that lead to improvements in episodic memory during child development. Specifically, I will review evidence showing that: (1) changes in the hippocampus contribute to improvements in relational processes that integrate various features of an experience (e.g., what, when, where) into memory episodes; and (2) changes in fronto-parietal processes facilitate the refinement of the capacity to reflect on the subjective phenomenology of episodic memory. I will also show how these processes operate in infancy and whether they suggest developmental continuity in memory functioning. I will end by highlighting current challenges and directions for future research.

# Keynote session VI

**K6 session**

Wednesday, 20 July 2016 | 08:30 - 09:20 | Room 1

**Chair/Organizer: Mihaly Racsmany**

**A-1072 KEYNOTE LECTURE: Predicting, comprehending, and remembering events**

Jeffrey M. Zacks

Washington University in Saint Louis

In the laboratory, the “episodes” in episodic memory can be constructed from controlled materials such as list of words or pictures. In the real world, episodes must be constructed during encoding and that structure leaves its fingerprints on subsequent memory. In this talk I will describe a theory that relates the subjective experience of events to computational mechanisms of prediction error monitoring and memory updating. Briefly, Event Segmentation Theory proposes that perceivers maintain a working memory representation of the current event and use it to guide predictions about what will happen in the near future. When prediction error spikes, they update their model. Data from individual differences, neuropsychology, and neuroimaging suggest that this mechanism is functionally significant for memory and that it can be impaired by neurological injury or disease. New results indicate that it is possible to improve the encoding of event structure and that this may improve subsequent memory. Such results have implications for technology design and for the remediation of memory disorders in conditions including healthy aging, Alzheimer’s disease, and post-traumatic stress disorder.

# Social Aspects of Memory: Building a collective memory through collaborative remembering I

**S0151 session**
Wednesday, 20 July 2016 | 09:30 - 11:30 | Room 1
**Chair/Organizer: William Hirst, Suparna Rajaram**
**Discussant: William Hirst**

**A-0216 Collaborative remembering as skilled action**
John Sutton, Celia B. Harris, Amanda J. Barnier
Macquarie University, Sydney, Australia
In a small but important number of cases, certain dyads and small groups become highly skilled in collaborative recall. Expertise develops with time, practice, and/or training. Conceptualizing group remembering as a form of skilled action generates novel empirical predictions. We expect differences between individuals and between groups in skill development based on available time, practice, or training. The presence of these skills should appear in the ways groups remember together, with key microprocesses of shared remembering predicting collaborative success. We expect heterogeneity in the outcomes of collaborative remembering across groups, reflecting unique histories. To support these claims, we draw on empirical data from our research to show that outcomes of group remembering depend on particular kinds of expertise and skills.

**A-0217 Transmission of emotional memories in different social networks**
Suparna Rajaram [1], Hae-Yoon Choi [1], Elizabeth A. Kensinger [2]
[1] Stony Brook University, Stony Brook, NY, USA; [2] Boston College, Boston, MA, USA
We investigated whether the valence of memories (negative, positive, or neutral) and the extent to which people share memories modulate memory propagation across networks consisting of small, iterative partners (identical groups) or a larger network of partners (reconfigured groups). After individually studying picture-word pairs, participants completed one of three consecutive recalls: Individual–Individual–Individual (Control), Collaborative–Collaborative (Identical)–Individual, and Collaborative–Collaborative (Reconfigured)–Individual. Compared to the control condition, collaboration boosted emotional memory enhancement, especially for negative information. Similarly, collective forgetting was most pronounced for positive information. False memory propagation, regardless of valence, depended on network configuration. In reconfigured groups, there was greater variety of false memory compared to identical groups whereas collective false memory was higher in identical groups.

**A-0218 Personal characteristics influence the social contagion of memory**
Michelle L. Meade, Perga J. Pust, Katie M. Hart, Matthew K. Vess
Montana State University, Bozeman, MT, USA
We examined the influence of personal characteristics on the magnitude of social contagion. Participants recalled household scenes with a confederate recalling erroneous information. Personal characteristics were manipulated by instructing participants to focus on their true self-concept, by manipulating whether they perceived the confederate as a friend, and by manipulating whether they perceived their memory as better or worse than the confederate's memory. Participants in all conditions incorporated the confederate's suggestions into their own memories thus demonstrating social contagion. However, the magnitude of social contagion was influenced by personal characteristics and the patterns varied across recall and recognition tests. Personal characteristics influence how likely individuals are to incorporate others' suggestions on a memory test.

**A-0219 Socially shared retrieval-induced forgetting: A mechanism for collective memory formation**
William Hirst, Martin Fagin, Robert Meksin
New School for Social Research, New York, NY USA
Remembering is often embedded in acts of communication. The resultant selective remembering can lead to selective forgetting in both the communicator and communicatee. Such socially shared retrieval-induced forgetting (SSRIF) can foster collective forgetting and promote the formation of a collective memory in which aspects of the past are silenced. Such a claim is support by research showing SSRIF is (1) more likely when communication is between ingroup members, (2) less likely when communicatees feel their group identify is threatened, and (3) long-lasting. With respect to the latter, we present evidence that SSRIF is found after a month. SSRIF may indeed be a viable mechanism for shaping the silenced aspects of long-lasting collective memories.

**A-0220 Intergenerational narratives and personal identity**
Robyn Fivush
Emory University, Atlanta, GA, USA
Personal identity and well-being are deeply embedded in family history and family stories. How and what adolescents and young adults know about their intergenerational past provides a basis for their own emerging sense of self. In a programmatic series of studies, we examine knowledge about family history and content of intergenerational narratives about parents' childhoods, in relation to identity and well-being. Young people who know more of their family history, and those who make a specific connection to self in their intergenerational narratives, display higher levels of self-esteem and identity exploration and commitment, above and beyond other measures of family functioning. These findings point to the power of family stories for personal identity and well-being.

**A-0221 Conflicting memories of World War II**
Henry L. Roediger [1], Magdalena Abel [2], Sharda Umanath [3], Ruth A. Shaffer [1], James V. Wertsch [1]
[1] Washington University, St. Louis, MO, USA; [2] University of Regensburg, Regensburg, Germany; [3] Claremont-McKenna College, Claremont, CA, USA
World War II was one of the defining events of the 20th century. In our study we examined how people in 11 countries remembered the war. We surveyed over 100 people in each country about collective memories of key events in the war, their knowledge about the war, and their estimates of their country's proportion of responsibility for winning (or losing) the war. The results demonstrate quite different memories of the war (even "facts" about the war) depending on the nationality of the respondent. In addition, respondents showed national narcissism by attributing a great proportion of the victory (and even of the loss) to their own country's contributions. The results provide strong evidence for narcissism in national collective memory.

# Retrieval processes II

**I012 session**
Wednesday, 20 July 2016 | 09:30 - 11:30 | Room 2
**Chair/Organizer: Janina A. Hoffmann**

**A-0417 Is testing a more effective learning strategy than note-taking?**
Ralf Rummer [1], Judith Schweppe [1], Kathleen Gerst [2]
[1] University of Erfurt, Germany; [2] University of Bremen, Germany
Two experiments investigate the testing effect in text-based learning. Experiment 1 applies a 3x3 between-participants design with the factors learning condition (repeated reading vs. repeated testing vs. repeated note-taking) and final test delay (5 minutes vs. 1 week vs. 2 weeks). In the immediate condition, learning was best after note-taking, after one week, both the note-taking and the testing group outperformed the rereading group, and after two weeks, testing was superior to note-taking and rereading. Experiment 2 contrasted repeated testing with two note-taking conditions: note-taking plus note-reading and note-taking plus testing. The two conditions including a testing phase resulted in better long-term learning than note-taking plus note-reading. The results underline the importance of retrieval practice in long-term learning.

**A-0509 Verbatim vs. gist sentence recall: Effects on processing and recall performance**
Judith Schweppe, Almut Ketzer-Nöltge, Ralf Rummer
University of Erfurt, Germany
Sentence recall is an atypical verbal working memory task in that it is driven by semantic rather than phonological processing. Two experiments test the assumption that semantic processing is less dominant with verbatim than with gist recall and that the former is cognitively more demanding than the latter. Experiment 1 found longer reading times for “reading-for-verbatim-recall” than for “reading-for-gist-recall” and “reading-for-comprehension”. Experiment 2 measured eye-movements in the visual world paradigm. Fixations of objects mentioned in the sentences -indicative of semantic processing – occurred less frequently and later with a verbatim recall instruction than in the other conditions. A verbatim recall instruction therefore altered sentence processing, but this did not improve recall performance compared to more conceptual processing in either experiment.

**A-0527 Cue-independent memory impairment by reactivation-coupled interference in human declarative memory**
Zijian Zhu [1,2], Yingying Wang [1], Zhijun Cao [3], Biqing Chen [1,2], Huaqian Cai [4], Yanhong Wu [3], Yi Rao [1,2,5]
[1] Peking-Tsinghua Center for Life Sciences, Academy for Advanced Interdisciplinary Studies, Peking University, Beijing, Chinarn[2] State Key Laboratory of Biomembrane and Membrane Biology at the School of Life Sciences, Peking University, Beijing, Chinarn[3] Department of Psychology, Beijing Key Laboratory of Behavior and Mental Health, and Key Laboratory of Machine Perception (Ministry of Education), Peking University, Beijing, Chinarn[4] School of Electronics Engineering and Computer Science, Peking University, Beijing, Chinarn[5] PKU-IDG/McGovern Institute for Brain Research, Peking University, Beijing, Chinarn
Upon retrieval, a consolidated memory can re-enter a transiently labile state, which is susceptible to interference, and therefore requires a reconsolidation process to be preserved. Previous studies have shown that interference upon reactivation disrupts memory reconsolidation. However, attempts have failed in disrupting human declarative memory, raising a question about whether declarative memory becomes unstable upon reactivation. Here, we used a double-cue/one-target paradigm and found, for the first time, that reactivation-coupled interference caused cue-independent memory impairment that generalized to other cues associated with the memory. Critically, such memory impairment appeared immediately after interference, before the reconsolidation process was completed, suggesting that common manipulations of reactivation-coupled interference procedures might disrupt other processes in addition to the reconsolidation process in human declarative memory.

**A-0563 Frequent Testing in the Classroom Promotes Mastery of New Concepts**
Ayanna K. Thomas [1], Leamarie T. Gordon [2], Amy Smith [1], Kanika Kamal [1]
[1] Tufts University [2] Assumption College
Traditional undergraduate educational in the United States has received increased criticism. The structure of these courses has been one of the primary focuses of criticism, because that structure has remained relatively stagnant for decades, taking the form of several weeks of lecture, followed by examination. This structure has been shown to increase test-related anxiety and result in limited long-term retention of material. The present study employed a factorial design to examine whether a college level course could be restructured to reduce test-related anxiety and promote long term retention. Students in a course engaged in retrieval or study practice during individual class meetings. Frequent testing facilitated memory, comprehension, and promoted learning of new related concepts.

**A-0603 Deviations from a schema: Effects of changes of content and order on remembering repeated events**
Eva Rubinova, James Ost, Hartmut Blank, Ryan Fitzgerald
Department of Psychology, University of Portsmouth, United Kingdom
In two experiments, we investigated memory for repeated, schema-establishing events. These novel events consisted of structured word-lists. The schema was operationalized as an ordered sequence of word categories that was constant across list presentations. Participants either saw four (typical) instances with the same structure, or three typical and one exceptional instance that included a change of content, order, or both content and order. We focused on participants’ recall of typical and exceptional instances, their metacognitive awareness of changes, and changes in recall organization (clustering and sequencing) associated with schema-deviations. Content-deviations—noticed by most participants—enhanced delayed recall and strengthened clustering of recall into categories. Order-deviations—which few participants noticed—disrupted both delayed recall as well as the sequencing of recall.

**A-0661 Tracing the path of forgetting in rule abstraction and exemplar retrieval**
Janina A. Hoffmann [1], Bettina von Helversen [2], Regina A. Weilbächer [3], Jörg Rieskamp [3]
[1] University of Konstanz, Germany; [2] University of Zurich, Switzerland; [3] University of Basel, Switzerland
People often forget acquired knowledge over time. Which knowledge people can still retrieve may, however, limit their ability to make accurate judgments. Specifically, forgetting may impede judgments based on retrieving past exemplars from long-term memory more than remembering judgments based on rules. Experiment 1 tracked the individual course of forgetting by systematically prolonging the retention interval between a training and later tests. Practicing the acquired judgment strategy in repeated tests helped participants to consistently apply the judgment strategy.

Yet, whereas a long retention interval did not affect rule-based judgments, it impaired judgments based on exemplar retrieval. With restricted practice (Experiment 2), participants tried to reconstruct their judgments after a week by applying rules and judgment accuracy suffered in both tasks.

**A-0792 Gaze position enhances memory accessibility during competitive memory retrieval**

Roger Johansson, Mikael Johansson
Department of Psychology, Lund University

While previous research has demonstrated that gaze position can increase the accessibility of previous memories (Johansson & Johansson, 2014), the present study tested whether such gazes can assist in selecting target memories at the expense of competing memories. An adapted retrieval practice paradigm was used, where participants engaged in repeated selective retrieval while looking at locations that either overlapped with the target memory's encoding location or with a competitor's encoding location. Encoding-retrieval overlap in gaze positions resulted in reduced activation of competitors, as evidenced by the elimination of retrieval induced forgetting for non-practiced items in the succeeding test phase. Corroborating evidence from pupil size measures indicate that overlapping gaze positions during retrieval practice reduce the need for inhibitory control mechanisms.

# The neurocognitive mechanisms of prospective memory development

**S0045 session**
Wednesday, 20 July 2016 | 09:30 - 11:30 | Room 3
**Chair/Organizer: Mareike Altgassen, Daniel P. Sheppard**
**Discussant: Judi A. Ellis**

**A-0550 Future thinking improves children's prospective memory in social and neutral prospective memory tasks**
Anett Kretschmer [1], Katharina M. Schnitzspann [2], Mareike Altgassen [1,3]
[1] Technische Universität Dresden, Germany; [2] University of Aberdeen, School of Psychology; [3] Radboud University, NL
Studies on how to improve children's ability to remember future intentions (i.e., prospective memory, PM) are still scarce. This study aimed at investigating the effects of future thinking on children's PM performance in neutral and social PM tasks. Fifty-six children aged 10 to 12 years performed a rather naturalistic PM task which included neutral and social tasks, while simultaneously varying PM task encoding conditions (future thinking vs. elaborated encoding) between subjects. PM performance did not differ between PM task types. However importantly, compared to the elaborated encoding condition, social and neutral PM was significantly improved, when children received future thinking instructions. Thus, results indicate that future thinking improves PM beyond the simple repeated exposure with PM tasks during encoding.

**A-0551 Sensory salience and prospective memory in autistic children**
Daniel P. Sheppard [1], Mareike Altgassen [1,2]
[1] Radboud University, NL; [2] Technische Universität Dresden, Germany
The current study was the first to investigate the impact of cue salience (distinctiveness) on prospective memory (PM) in autistic and non-autistic children. The study was also unique in manipulating the visual and auditory salience of the PM cues. Results revealed both groups were faster to react to PM cues with increased visual salience, but only autistic participants benefitted from an increase in auditory salience. Thus, the PM performance of all children may benefit from increased visual cue salience, but, autistic children, many of whom experience atypical auditory sensitivity, may be particularly able to take advantage of increased auditory salience. The ways in which cue salience may be used to support autistic children in their everyday lives will be discussed.

**A-0552 Event-, time- and activity-based prospective memory in children with ADHD**
Tian-xiao Yang [1], Yanyu Wang [2], Ying Qian [3], Raymond C.K. Chan [1]
[1] Chinese Academy of Sciences, China; [2] Weifang Medical University, China; [3] Peking University, China
In this study, we investigated the event-, time- and activity-based prospective memory (PM) in children with ADHD. A group of 28 children with ADHD and 28 typically developing children completed a PM task and two attentional tasks. While ADHD group were impaired in the attentional tasks, they had comparable PM performances as typical group in all three types of PM tasks. Moreover, both groups showed similar ranks of PM performances (from high to low: activity-based PM task, event-based PM task, and time-based PM task). However, the intact PM performances in ADHD group were at the cost of impaired ongoing task performances and increased errors in retrospective memory component of PM. The theoretical and clinical implications of these findings are discussed.

**A-0553 How intentions modulate attention in the Eriksen flanker task**
Anna-Lisa Cohen [1], Gesine Dreisbach [2]
[1] Yeshiva University, New York, USA; [2] University of Regensburg, Germany
In a study by Cohen, Gordon, Jaudas, Hefer and Dreisbach (2016), participants performed an Eriksen Flanker task with an embedded prospective memory (PM) task in which they had to remember to make a different response if they encountered a pre-specified PM cue. Results from two studies demonstrated the flexibility of monitoring as participants were able to easily "switch off" attending to PM cues when the PM task was delayed (Experiment 1) or when they were instructed to forget the PM task (Experiment 2). In a more recent study, we increased the salience of the PM cue to investigate whether increased salience would lead to attention capture when the cue appeared in an unexpected context.

**A-0554 Stay focused! Adding prospective memory demands to a task causes a stronger on-task focus**
Jan Rummel [1], Bridget A. Smeekens [2], Michael J. Kane [2]
[1] University of Heidelberg, Germany; [2] University of North Carolina at Greensboro, USA
Attention-allocation accounts of prospective memory (PM) assume that attentional processes are usually recruited at a cost to a currently ongoing task in order to maintain a PM intention. In two experiments, participants performed an ongoing task either with or without an additional PM task and participants' engagement in task-unrelated thoughts (TUTs) were meanwhile assessed. Results showed that participants engage in TUTs while holding an additional PM intention, but to a lesser extent than while performing an ongoing task alone. These findings demonstrate that individuals holding an intention not only distribute their attention between the PM and the ongoing task but also focus more on their tasks at hand. Implications for current PM theorizing are discussed.

**A-0555 Acute psychosocial stress effects on time-based prospective memory in young and older adults**
Katharina Schnitzspahn [1], Franziska Plessow [2,3], Clemens Kirschbaum [3], Matthias Kliegel [4]
[1] University of Aberdeen, UK; [2] Harvard Medical School, USA; [3] Technische Universitaet Dresden, Germany; [4] University of Geneva, Switzerland
The present study examined acute stress effects on time-based prospective memory in young and older adults in a controlled laboratory setting. Stress responses were measured across the entire procedure using subjective and physiological stress markers. After having induced stress or an active control condition, participants were asked to perform the prospective memory task. First results suggest that the stress induction was successful in both age groups. While monitoring behavior was reduced under stress in the young adults, their prospective memory performance was not significantly impaired compared to controls. Further, stress did not affect monitoring or prospective memory performance in the older adults. Results will be discussed in the context of current neurocognitive models on emotion-cognition interactions in aging.

# Forgetting I

**I021 session**

Wednesday, 20 July 2016 | 09:30 - 11:30 | Room 4

**Chair/Organizer: Paula Hertel**

**A-0064 Both instruction to forget and simple repetition can aid forgetting words people have learned by heart.**

Alena Gofman [1], Veronika Nourkova [1], Michail D.Kozlov [2]

[1] Lomonosov Moscow State University; [2] Leibniz-Institut fuer Wissensmedien, Germany

The study demonstrates that both the instruction to forget and simple repetition lead to failures in retrieving words people have learned by heart. 98 participants, who had demonstrated flawless recall of a list of native – artificial word pairs at screening were shown the native words and asked to either keep remembering, or to forget their translation, to repeat the native word ten times or to do a brief task. At free recall tests, administered 45 minutes and a month later, participants' recall in the Forget and the Repeat conditions was significantly worse than participants' recall in the Remember condition. A year later an implicit recognition test showed the pattern of results similar to explicit recall at a month delay.

**A-0154 A multinomial modeling approach to separating storage and retrieval processes in list-method and item-method directed forgetting**

Ivan Marevic [1], Jan Rummel [1], Beatrice G. Kuhlmann [2]

[1] Heidelberg University, Heidelberg, Germany [2] University of Mannheim, Mannheim, Germany

Instructing participants to forget parts of previously studied information reduces recall of the to-be-forgotten compared to the to-be-remembered information. In Experiment 1, we applied the storage-retrieval multinomial model (Riefer & Rouder, 1992) to investigate the underlying cognitive mechanisms of such directed forgetting (DF) in both the list-method (blocked presentation of the to-be forgotten information) and the item-method (interleaved presentation of to-be-forgotten information). The results support current theorizing that list-method DF is caused by retrieval processes, but challenge theories on item-method DF indicating that both storage and retrieval processes underlie the item-method DF effect. Additional experiments revealed that this retrieval deficit is not caused by recall output order (Experiment 2) but rather by hampered access to item context (Experiment 3).

**A-0202 Involvement of the Basal Ganglia in Memory Suppression and Motor Inhibition: Meta-Analytic Evidence**

Yuhua Guo [1,2], Taylor W. Schmitz [1,2], Catarina Ferreira [3], Michael C. Anderson [1,2]

[1] MRC Cognition and Brain Sciences Unit, Cambridge, UK; [2] University of Cambridge, Cambridge, UK; [3] University of Birmingham

Memory suppression and motor inhibition share the cognitive process of active stopping. Previous research associated cortical activations with these forms of stopping. However, despite having a well-established role in motor control, the basal ganglia's (BG) involvement in memory suppression remains unexplored. Here we report a meta-analysis that included fMRI data from tasks requiring active suppression of prepotent thoughts or actions (e.g. Think/No-Think and Stop-Signal tasks), and revealed highly overlapping cortical and subcortical activations between memory and motor inhibition, including the right prefrontal cortex (DLPFC; VLPFC) and BG. These results provide strong evidence for a supramodal inhibition network in the brain, especially the novel indication that BG may be involved in memory suppression in a similar fashion as in motor inhibition.

**A-0210 Attentional Consequences of Thought Suppression**

Paula Hertel [1], Nilly Mor [2], Amaris Maydon [1]

[1] Trinity University, USA, [2] Hebrew University, Israel

Suppression-induced forgetting (SIF) is a frequently replicated finding obtained from the think/no-think (TNT) paradigm. In addition to its effect on cued recall, the suppression of unwanted thoughts has other cognitive consequences. For example, SIF is positive correlated with the extent of flanker interference on a subsequent unrelated task in which cues for suppressed targets serve as flankers (Hertel & Hayes, 2015). Now, we report new evidence that when suppressed targets serve as flankers reduced flanker interference was obtained (compared to baseline flankers), but only if the participants were not in the habit of ruminating. This restriction of reduced interference to non-ruminators is consistent with evidence that ruminators show poor cognitive control in a variety of attention and memory tasks.

**A-0338 Cue-independent Forgetting by Intentional Suppression -- Evidence for Inhibition as the Mechanism of Intentional Forgetting**

Yingying Wang [1], Zhijun Cao [2], Zijian Zhu [1], Huaqian Cai [3], Yanhong Wu [2,4]

[1] Peking-Tsinghua Center for Life Sciences, Academy for Advanced Interdisciplinary Studies, Peking University, Beijing, Chinarn[2] Department of Psychology, Beijing Key Laboratory of Behavior and Mental Health, and Key Laboratory of Machine Perception (Ministry of Education), Peking University, Beijing, Chinarn[3] School of Electronics Engineering and Computer Science, Peking University, Beijing, Chinarn[4] PKU-IDG/McGovern Institute for Brain Research, Peking University, Beijing, Chinarn

People are able to intentionally forget unwanted memories through voluntary suppression, as revealed by the Think/No-think (TNT) paradigm. However, the nature of intentional forgetting is controversial. Findings that forgetting is independent of retrieval cues suggest that inhibitory control underlies intentional forgetting, but this result is also in line with an interference account. To resolve this controversy, we have directly contrasted the cue-independent characteristic of suppression versus interference. The results showed that interference caused cue-dependent memory impairment, while suppression induced cue-independent forgetting. Therefore, the effect of suppression differs from that of interference. The cue-independent forgetting by voluntary suppression indicates that the target memory itself is inhibited, providing evidence that the underlying mechanism of suppression-induced forgetting is inhibitory control.

**A-0374 Retrieval-induced forgetting in motor memory**

Tobias Tempel, Christian Frings

University of Trier, Germany

We investigated properties of retrieval-induced forgetting in motor memory. In a series of experiments, participants first learned sets of motor sequences in response to individual stimuli. An item set was defined by a common feature of the sequences, such as, the same effector used for movement execution or a common movement direction. After retrieval practice on a subset of sequences, a final test assessed memory for all items. We found retrieval-induced forgetting of motor action to be retrieval-specific, to be independent from strengthening of practiced items, to depend on competition during retrieval practice, and to occur with novel test cues. These findings correspond to an inhibitory account.

# Insights into memory using the case study approach

**S0032 session**
Wednesday, 20 July 2016 | 09:30 - 11:30 | Room 5
**Chair/Organizer: Scott Cole, Kata Pauly-Takacs**
**Discussant: Martin A. Conway**

**A-1052 Functional independence within the temporally extended self-memory system: insight from a case of developmental amnesia**
Pascale Piolino
University of Paris Descartes
Through the study of a developmental amnesic patient suffering of neonatal brain injuries, we explored how the different facets of the temporally extended self-memory system develop when growing up with bilateral hippocampal atrophy. Neuropsychological evaluations showed that the patient suffered from dramatic episodic learning disability with no sense of recollection, whereas her semantic abilities were completely preserved. Episodic autobiographical memory lacked specificity, details and sense of re(pre)experiencing whatever the lifetime periods and the future, whereas semantic autobiographical memory including self-concepts was normal. This case study highlights that semantic self-knowledge may be acquired without episodic memories.

**A-0462 Recollection and familiarity following limbic encephalitis: a case study**
Kata Pauly-Takács [1], Lara Charlesworth [2], Chris Moulin [3]
[1] Leeds Beckett University, UK; [2] King's College London, UK; [3] Université Grenoble Alpes, France
SA is a 54-year-old maths teacher who presented with partial retrograde memory loss and everyday recognition memory failures following limbic encephalitis. Standard neuropsychological assessment failed to capture significant memory impairments despite subjective complaints. We were motivated to explore the subjective experiences associated with memory in experimental paradigms. In order to measure episodic memory, a source memory task and the inclusion/exclusion tasks were administered to SA and controls. Subjective judgements of recollection and familiarity were also collected for all endorsed items in order to ascertain the association or dissociation between objective and subjective estimates of episodic memory. The particular pattern of SA's performance is discussed with reference to potentially separable components of episodic memory as a result of brain injury.

**A-0327 The effect of pulvinar damage on emotional processing of simulated scenes**
Scott Cole [1], Karl Szpunar [2], Robert Rafal [3], Oliver Turnbull [3]
[1] York St.John University, York, UK [2] University of Illinois at Chicago, Chicago, USA [3] Bangor University, Bangor, UK
Neuroscientific research has established a role for the pulvinar in emotional processing of perceived stimuli. More recently, neuroimaging research with neurologically healthy adults has shown a sensitivity of the pulvinar to emotionally negative internally-generated imagined future events. In this neuropsychological investigation, we tested how patients with focal pulvinar damage imagine emotionally neutral, positive and negative events. Based on previous fMRI data, we predicted a deficit in generating emotional - particularly negative - events in pulvinar patients compared with controls. In addition, Fluency and Everyday Frequency of emotional and non-emotional events were assessed, whilst controlling for narrative ability. We discuss unique insights of this neuropsychological evidence and how it contributes to the general understanding of the pulvinar's role in emotional processing.

**A-0268 The relationship between episodic memory and imagination – insights from semantic dementia**
Muireann Irish [1,2], Nadene Dermody [1,2], John Hodges [1,2]
[1] Neuroscience Research Australia, Sydney, Australia; [2] The University of New South Wales, Sydney, Australia
Patients with semantic dementia (SD) display progressive and amodal deterioration of the conceptual knowledge base in the context of relatively preserved episodic memory. Recent studies reveal marked deficits in episodic future thinking in SD, however, it remains unclear whether atemporal forms of imagination are disrupted. We investigated the capacity for scene construction in Patient G.C. who presented in the early stages of SD with left-lateralised temporal lobe atrophy. While the capacity to envisage and describe spatially coherent scenes of familiar locations was intact, G.C. appeared unable to construct scenes for which he lacked previous experience. Our findings suggest that in the absence of semantic knowledge, SD patients harness episodic representations of previously experienced events to construct fictitious scenes.

**A-1058 Pattern Separation deficits in a person with bilateral dentate gyrus lesions**
R. Shayna Rosenbaum [1,2], Steven Baker[1], Fuqiang Gao[3], Asaf Gilboa[2,4]
[1]York University, Toronto, Canada [2]Rotman Research Institute, Toronto, Canada [3]Sunnybrook Research Institute, Toronto, Canada [4] University of Toronto, Toronto, Canada
We present the rare case of B.L., a 54-year-old male with bilateral damage to the hippocampus that is relatively restricted to the dentate gyrus (DG). The DG is viewed as important for pattern separation, the process of reducing interference among similar neural inputs. Pattern separation integrity was examined in BL and age-matched controls using a series of well-established and novel tasks. Performance on the tasks indicate that, relative to controls, BL has difficulty distinguishing between studied targets and unstudied lures that are similar in visual appearance and conceptual category, indicating impaired pattern separation. The results provide definitive evidence in humans that pattern separation depends on DG integrity and encourage investigations of pattern separation beyond object recognition and the visual modality.

**A-0777 Conversational Skill and Memory Collaboration: A Case Study of the Impact of Hearing Loss**
Amanda J. Barnier, Celia Harris, Greg Savage
Macquarie University, Sydney, Australia
Across a lifetime in intimate relationships involving joint memory and action, people may form expert "remembering systems" that have later cognitive payoffs. We discuss the case of a long-married couple where collaborative expertise breaks down due to hearing loss. Such cases are important because of the clear but unexplained link between hearing loss and dementia. We explore the possibility that hearing difficulties disrupt conversational skills crucial to collaboration. If memory collaboration protects memory and cognition, losing benefits of collaboration may increase the risk of cognitive decline. And how might hearing interventions improve collaboration and thus memory and cognition? These speculations reveal a different face to work with successful memory collaborators: cases in which remembering systems are disrupted and remembering fails.

# Advances in high-resolution imaging of the MTL - Structural and functional development

**S0026 session**

Wednesday, 20 July 2016 | 09:30 - 11:30 | Room 6

**Chair/Organizer: Andrew R. Bender, Attila Keresztes**

**A-0441 CA1 atrophy and episodic memory deficits in the course of Alzheimer's: not as simple as it seems**

Robin de Flores, Renaud La Joie, Gael Chételat

Unité Inserm-EPHE-Université de Caen Normandie- CHU de Caen, U1077, France

Progresses in human neuroimaging techniques have enabled to show a predominant, early and strong atrophy of the CA1 subfield in the course of Alzheimer's disease, consistent with the pathological literature. This specific hippocampal damage was - as one could expect - shown to relate to episodic memory deficits, notably in patients with Mild Cognitive Impairment. However, recent data suggest more complex/inconstant relationships between CA1 atrophy and episodic memory deficits, especially considering patients with isolated subjective memory complaint (but normal neuropsychological examination) or semantic dementia. The presentation will stress the interests and limitations of subfield atrophy assessment to understand brain-memory relationships.

**A-0445 Ultra-high resolution imaging of MTL memory pathways during a domain-specific memory precision task**

David Berron [1,2], Andreas Becke [1,2], Alondra Chaire [1], Anne Hochkeppler [1], Hartmut Schütze [1], Magdalena Sauvage [3], Dharshan Kumaran [4], Emrah Düzel [1,2,4]

[1] Institute of Cognitive Neurology and Dementia Research, Otto von Guericke University Magdeburg, Germany; [2] German Center for Neurodegenerative Diseases Magdeburg, Germany; [3] Functional Architecture of Memory Unit, Mercator Research Group, Faculty of Medicine, Ruhr University Bochum, Germany; [4] Institute of Cognitive Neuroscience, University College London, United Kingdom

In the medial temporal lobe there are domain-specific pathways involving the perirhinal cortex (PRC) and the parahippocampal cortex (PHC) that support memory for object/item and scene/spatial information, respectively. Recent studies suggest that these pathways extend towards different subregions of the entorhinal cortex (EC) – the anterior-lateral (alEC) and posterior-medial EC (pmEC) - with the dentate gyrus and CA3 of the hippocampus acting to integrate information coming from these two domains. We used 7T ultra high-field fMRI to investigate the functional role of these two pathways within the medial temporal lobe and hippocampal subfields during a memory task that poses high demands on the precision of recognition memory and pattern separation of similar appearing object and scene stimuli.

**A-0446 Hippocampal Subfield Segmentation: A Comparison of Manual and Automated Methods Across the Lifespan**

Andrew R. Bender [1], Attila Keresztes [1], Nils C. Bodammer [1], Yee Lee Shing [1,2], Simone Kühn [1,3]

[1] Center for Lifespan Psychology, Max Planck Institute for Human Development, Berlin, Germany; [2] Division of Psychology, University of Stirling, Stirling, UK; [3] University Clinic Hamburg-Eppendorf, Clinic and Policlinic for Psychiatry and Psychotherapy

Multiple methods have been developed for manual and automated segmentation of hippocampal subfields, but little is known about their correspondence or differences in segmentation validity across the lifespan. To address this, we assessed reliability between manual and automated segmentations of hippocampal subfields on high-resolution, 3T MR images from children, adolescents, younger, and older adults. Manual segmentations followed current recommendations from the Hippocampal Subfields Group, whereas the Automatic Segmentation of Hippocampal Subfields (ASHS) software produced automated segmentations using custom, sample-specific atlases separately for younger and older groups, derived from subsets of manual segmentations. We discuss results and caveats, and suggest recommendations for optimizing manual segmentation rules and ASHS input parameters for reliably segmenting hippocampal subregions within and across age groups.

**A-0447 Using high-resolution imaging to investigate hippocampal subfield oscillatory correlates of human episodic memory**

Nanthia Suthana [1,2,3]

[1] Department of Psychology, University of California, Los Angeles, USA; [2] Department of Psychiatry & Biobehavioral Sciences, University of California, Los Angeles, USA; [3] Department of Neurosurgery, University of California, Los Angeles, USA

Hippocampal theta oscillations (4-12 Hz) have been implicated in episodic memory and movement in rodents. Growing evidence also suggests that coupling between theta and gamma oscillations may play a role in hippocampal-dependent memory. Use of high-resolution magnetic resonance imaging in patients with wireless intracranial electrodes implanted for epilepsy provides a unique opportunity to investigate hippocampal regional differences in oscillatory activity during learning, memory, and ambulatory behavior. Our results show that increases in hippocampal CA1 theta-gamma coupling predict subsequent memory on an episodic memory task. Furthermore, hippocampal CA1 theta oscillations increase significantly during movement compared to rest, similar to findings in rodents. Altogether, our results suggest a specific role for hippocampal CA1 theta oscillations during episodic memory and movement in humans.

**A-0449 Mapping hippocampal subfield contributions to episodic memory development**

Attila Keresztes [1], Andrew R. Bender [1], Nils C. Bodammer [1], Markus Werkle-Bergner [1], Yee Lee Shing [1,2]

[1] Center for Lifespan Psychology, Max Planck Institute for Human Development, Berlin, Germany; [2] Division of Psychology, University of Stirling, Stirling, UK

The CA3 and the dentate gyrus (DG) subfields of the hippocampus (Hc) have been implicated in the orthogonalization of overlapping memory representations by implementing pattern separation on neural inputs to the Hc. To date, the child-developmental trajectory of pattern separation is fairly unknown. Hence, we compared children (n=69, 6-14y) and adults (n = 33) to investigate the relationship between CA3/DG development, pattern separation, and episodic memory performance. We acquired high-resolution structural and functional MRIs. During functional scanning, participants performed an incidental learning task designed to assess pattern separation. Results indicate a maturational improvement in behavioral pattern separation. This is accompanied by age-differences in structural and functional measures of subfield integrity.

# Emotion and memory I

**I143 session**
Wednesday, 20 July 2016 | 09:30 - 11:30 | Room 7
**Chair/Organizer: Mara J. Richman**

**A-0716 The list composition effect on emotional memory: evidence from behaviour and neuroimaging**
Gemma Barnacle, Tobias Sommer, Dimitris Tsivilis, Deborah Talmi
[1] University of Manchester; [2] University Medical Center Hamburg-Eppendorf
Free recall of emotional pictures is better than free recall of neutral pictures, but only when these two types of pictures are presented in mixed lists. Free recall of emotional pictures is equivalent to that of neutral pictures in pure lists, which contain either emotional or neutral pictures. It is difficult to account for this pattern through existing models of emotional memory. I will review and evaluate a number of behavioural experiments to decide whether attention allocation at encoding can explain this pattern. Evidence from subsequent memory effects in this paradigm using EEG and an fMRI will also be considered. Finally, I will discuss how this pattern fits within existing memory models.

**A-0717 A Hierarchical Meta-Regression Analysis of Emotional Memory Enhancement Effects**
Jillian E. Lauer, Anaïs F. Stenson
Emory University, Atlanta, USA
Individuals exhibit better memory for emotional stimuli compared to neutral stimuli. In a meta-analytic review, we synthesized the emotional memory enhancement (EME) literature to determine the magnitude of EME effects across studies, analyzing more than 70 effect sizes (N=2,237). Specifically, we conducted a series of hierarchical meta-regressions that indicated that individuals indeed display greater memory for emotional stimuli relative to neutral stimuli (d=0.64, SE=0.17, p=0.018) and that preferential memory for negatively-valenced stimuli (d=0.77) is significantly greater than preferential memory for positively-valenced stimuli (d=0.36). In this presentation, we will discuss these findings as well as additional demographic and methodological moderators of interest, including data suggesting that neither gender nor stimulus type (i.e., words vs. pictures) moderate the magnitude of the EME.

**A-0737 The Effects of Repeatedly Recalling a Traumatic Event on Memory and Psychological Response**
Elisha Chan, Celine van Golde, Helen Paterson
The University of Sydney, Sydney, Australia
The aims of this study were to examine the effects of repeatedly recalling a traumatic event on recall performance, eyewitness suggestibility and psychological response. It was also investigated whether these effects were mediated by the type of details recalled and the completeness of retrieval. Results indicated that repeated recall enhanced memory relative to no recall, and that repeated complete recall in particular inoculated against trauma-related (central) misinformation. It was also discovered that repeatedly recalling trauma-related details increased trauma-related confabulations. This not only warns of the dangers of repeatedly questioning witnesses about the traumatic details of an event, but it also illustrates the value of repeated complete recall to best preserve the integrity of eyewitness memory.

**A-0924 Autobiographical memory impairment in post-traumatic stress disorder and borderline personality disorder: a meta-analysis**
Mara J. Richman [1,2], Eszter Beran [3], Zsolt Unoka [1]
[1] William J. Fulbright Program, Washington D.C., USA [2] Semmelweis University, Budapest, Hungary, [3] Pázmány Péter Catholic University, Budapest, Hungary
Post traumatic stress disorder (PTSD) and borderline personality disorder (BPD) are both characterized by impaired functioning in autobiographical memory (AM), which has been suggested to relate to dissociative symptoms. In this study, we used a quantitative meta-analysis on autobiographical memory performance of adults clinically diagnosed with PTSD and BPD. We examined both PTSD and BPD patients in terms of AM functioning, as well as comparing the two patient groups. Our results confirmed that the PTSD group shows a more severe impairment of AM functioning than the BPD group. In addition, we also found that both BPD and PTSD patients show impairment on the Autobiographical Memory Test in comparison to healthy control groups.

**A-0946 The developmental trajectory of emotion effects on subsequent memory: Evidence from brain and behavior**
Anaïs F. Stenson [1], Jacqueline S. Leventon [2], Patricia J. Bauer [1]
[1] Emory University, Atlanta, USA; [2] California State University, San Bernardino, USA
Adults remember emotional events better than neutral events. This emotional memory enhancement (EME) effect appears in behavioral and neural measures. In contrast, the developmental trajectory of EME effects is uncertain (Leventon, Stevens, & Bauer, 2014). We examined EME effects in 8-10, 11-13, and 14-16-year-olds by recording event-related potentials (ERPs) and behavioral responses while participants viewed positive, negative, and neutral photographs. Two weeks later, we tested old/new recognition. Corrected recognition performance (proportion of hits-false alarms) indicated significant EME effects (F(2, 234) = 92.218, p

# Modulation of replay for sleep-dependent memory consolidation

**S0008 session**

Wednesday, 20 July 2016 | 09:30 - 11:30 | Room 8

**Chair/Organizer: Gordon B. Feld, Thomas Schreiner**

**A-0079 The impact of cueing foreign vocabulary during sleep on memory performance and oscillatory activity**

Thomas Schreiner [1], Mick Lehmann [2], Björn Rasch [1]

[1] University of Fribourg, [2] University of Zurich

Re-exposure to memory cues during sleep reactivates memories and improves later recall. In the first part of my talk I will show that the memory benefits of cueing foreign vocabulary during sleep are completely blocked when memory cues are directly followed by either correct or conflicting auditory feedback. Furthermore, immediate auditory stimulation abolishes increases in oscillatory theta and spindle activity typically associated with successful reactivation during sleep. These results suggest that plastic processes associated with theta and spindle oscillations are necessary for stabilizing reactivated memory traces during sleep.

**A-0080 Optimising the benefits of cued memory reactivations in the sleeping brain**

Scott Cairney

University of York

Newly-formed memories are reactivated and strengthened when the sleeping brain is re-exposed to auditory memory cues. However, it is unclear which factors influence the success of memory cuing in sleep. First I will show that the benefits of cuing are contingent on recall accuracy prior to sleep and the presence of direct cue-memory associations. Next, I will show that re-exposure to verbal and non-verbal cues yields equal benefits for memory. Finally, I will demonstrate that the effectiveness of verbal cues is dependent on an acoustic match between the stimuli delivered at learning and in subsequent sleep. Collectively, these data will provide evidence that the memory enhancing effects of cuing can be optimized by varying the reactivation cue or newly-learned information.

**A-0081 Biasing hippocampal replay during sleep**

Daniel Bendor

University College London: Department of Experimental Psychology

Memory storage in the brain is a dynamic process. Self-experienced events are initially encoded in the hippocampus, but over time are consolidated in neocortical brain areas. Consolidation has been postulated to occur during sleep, by the replay of neural patterns in the hippocampus reflecting previous experiences, providing a mechanism to transfer memories between the hippocampus and neocortex. However, whether the interactions between the hippocampus and neocortex during sleep are unidirectional or bidirectional is an open question. We found that playing task-related auditory cues to a sleeping rat biased the content of replay events towards reactivating the spatial trajectory associated with the cue. These data indicate a bidirectional interaction between the hippocampus and neocortex during sleep.

**A-0082 The recall of newly-encoded assembly-patterns in the hippocampus depends on their sleep reactivation**

David Dupret

MRC Brain Network Dynamics Unit, University of Oxford

How do neuronal dynamics support the emergence of new memories, and what network mechanisms underlie the strengthening of those that finally persist? In the case of spatial memories these questions can be addressed by monitoring and manipulating cell ensemble activity in the hippocampus, a circuit that provides the rodent brain with a map-like representation of space. In this talk, I will present recent data showing that the off-line reactivation of newly-encoded assembly-patterns during hippocampal sharp wave/ripple (150-250Hz) events not only predicts, but is also required for their subsequent awake reinstatement alongside stabilized memory performance. Altogether, these findings provide further support for an important contribution of SWR-reactivation to memory persistence.

**A-0083 Hierarchical nesting of slow oscillations, spindles and ripples in the human hippocampus during sleep**

Bernhard Staresina

University of Birmingham

During systems-level consolidation, mnemonic representations initially stored in the hippocampus are thought to migrate to neocortical sites for more permanent storage, with an eminent role of sleep for facilitating this information transfer. Mechanistically, consolidation processes have been hypothesized to rely on systematic interactions between slow oscillations (SOs), spindles and ripples. We used direct intracranial electroencephalogram recordings from human epilepsy patients during natural sleep to test the assumption that these three oscillations are functionally coupled in the hippocampus. Employing cross-frequency phase-amplitude coupling analyses, we found that spindles were modulated by the up-state of SOs. Critically, spindles were found to in turn cluster ripples in their troughs, providing fine-tuned temporal frames for the hypothesized transfer of hippocampal memory traces.

**A-0084 Sleep for systems consolidation**

Lisa Genzel, Richard Morris

University of Edinburgh

Memories are thought to initially rely on hippocampal involvement but over time cortical representations are sufficient for successful retrieval. This process – coined systems consolidation – is thought to rely on mechanisms occurring during sleep, however direct evidence is still missing. In a sequence of studies we show that sleep after learning does lead to cortical memory representations while post-encoding novelty combined with sleep deprivation tags a memory to remain hippocampal. Further, both downscaling in the cortex and hippocampus-led memory-replay contribute to systems consolidation during sleep. These results show that multiple processes co-act during sleep and that systems consolidation occurs at a much shorter timescale than previously thought.

**A-0085 Sleep enhances a spatially mediated generalization of learned values**

Hugo Spiers [1], Amir-Homayoun Javadi [2]

[1] University College London, [2] University of Kent

Sleep is thought to play an important role in memory consolidation and preferentially target salient items. I will present results from a study where we

investigated whether sleep alters the subjective value associated with objects located in spatial clusters that were navigated to in a large-scale virtual town. We found that sleep enhances a generalization of the value of high-value objects to the value of locally clustered objects, resulting in an impaired memory for the value of high-valued objects. Our results are consistent with (a) spatial context helping to bind items together in long-term memory and serving as a basis for generalizing across memories and (b) sleep mediating memory effects on salient/reward-related items.

**A-0086 The limit of sleep-dependent memory consolidation**

Gordon B. Feld, Patrick Weis, Jan Born
University of Tübingen

The essential function of sleep for the maintenance of long-term memory is subject to a number of boundary conditions, e.g., relevance determines whether a memory gains access to sleep's beneficial effect. In two experiments we examined how the amount of encoded material influences sleep-dependent memory consolidation. In the evening, participants either learned a short (40) or a long (160 in experiment 1, 320 in experiment 2) list of semantically related word-pairs. Afterwards, half of the participants were allowed to sleep for 8 hours, while the others stayed awake. Recall was tested after recovery sleep, i.e., the morning thirty-six hours after learning. A benefit of sleep was only found in the 160 word-pair condition, indicating a limit to sleep-dependent memory consolidation.

# Social Aspects of Memory: Building a collective memory through collaborative remembering II

**S0152 session**
Wednesday, 20 July 2016 | 12:00 - 14:15 | Room 1
**Chair/Organizer: William Hirst, Suparna Rajaram**
**Discussant: Suparna Rajaram**

**A-0222 Influence of communication with experts on lay people's memory for inconsistent scientific evidence**
Gerald Echterhoff, Judith Knausenberger
University of Münster
How does communication with experts affect people's memory for inconsistent evidence about scientific issues? In Experiment 1, participants anticipated communication about infant vaccination or health risks from mobile phones without knowing their communication partner's opinion. Their recall was evaluatively more polarized (indicating stronger cognitive tuning) with an expert (vs. lay) interlocutor, especially after preparing for message production (vs. reception). In Experiment 2, participants produced messages for an audience with a positive or negative opinion. Recall was evaluatively assimilated to the expert audience's opinion (reflecting an audience-tuning effect), especially in participants who regard knowledge as stable and objective (vs. unstable and subjective). With a lay audience, the audience-tuning effect was found only for participants who regard knowledge as unstable and subjective.

**A-0223 Intergenerational mnemonic transmission in Belgian, Hungarian, and Hungarian Jewish families**
Aurélie van der Hagen [1], Eva Fulop [2], Pal Kovago [2], Olivier Luminet [1]
[1] Université Catholique de Louvain, Louvain, Belgium; [2] Pázmány Péter Catholic University, Budapest, Hungary
Stone et al. (2014) reported poor intergenerational transmission of information, with little known about the personal experiences of the first by the third generation. Following on this observation, we conducted semi-structured interviews acorss three generations of five French-speaking Belgian families, six Hungarian families, and five Hungarian families of Jewish origin, asking participants about four topics concerning World War II. We found results similar to Stone et al. for the Belgian and the Hungarian non-Jewish groups. However, for the Jewish Hungarian group, we did not find differences across the three generations. The history of persecution endured by the Jewish Hungarians may have contributed to more transmission across generations, similarly to results obtained by Nahhas (2012) with Palestinian families.

**A-0224 "Never forget": An examination of the intergenerational transmission of 9/11 memories**
Charles B. Stone [1], William Hirst [2]
[1] John Jay College of Criminal Justice, New York, NY, USA; [2] New School for Social Research, New York, NY, USA
Little is known about the transmission from one generation to the next of long lasting memories, such as those many hold of the 9/11 attack. What is transferred and under what circumstances? With these questions in mind, we examined the memories of those who lived through 9/11 and their children. In particular, we were interested in what the children knew about 9/11, where they learned this information, and the extent to which it shapes their American identity. Our results are discussed in terms of cultural and communicative memories and their importance in transmitting long lasting memories across generations.

**A-0225 In 1980, there was an outbreak of cholera and famine: Life story memories of the Ik of Uganda**
Annette Bohn, Rane Willerslev, Lotte Meinert
Aarhus University, Aarhus, Denmark
Autobiographical memory research is usually conducted with so-called WEIRD (Western Educated Industrialized Rich Democratic) populations. Cross-cultural studies usually compare equally well-educated populations. Here, seven most important life story memories were collected from 79 Ik (22% female, Mage=41.8; SD=17.2), a hunting and subsistence agriculturalist, mostly illiterate population in northern Uganda. Participants dated and rated memories on valence. Memories of this Non-WEIRD population showed important differences to life story memories found in WEIRD populations: 1) participants recalled a higher percentage of negative memories (42.2 %); 2) 45.5% of memory descriptions included a reference to a specific year 3) only 25% of memories were strictly personal. Most memory descriptions dealt with the impact of famine, political and military conflict on personal lives.

**A-0226 Past and future event narratives in three clinical patient groups and a healthy control group**
Anne Rasmussen [1], Carsten R. Jørgensen [1], Maja O'Connor [2], Birgit E. Bennedsen [2], Kristine D. Godt [2], Rikke Boye [2], Dorthe Berntsen [1]
[1] Aarhus University, Aarhus, Denmark; [2] Aarhus University Hospital, Aarhus, Denmark
When do Cultural Life Scripts shape people's life stories? We examined the role Danish Cultural Life Scripts play in shaping word content and emotional valence of self-generated past and future event narratives, focusing on those diagnosed with borderline personality, eating, or obsessive compulsive disorders. All groups, including a healthy control group, rated future narratives as more emotionally positive; past narratives as being more realistic, social and negative. Compared to the control group, the eating disorder group rated their narratives as more emotionally negative. Narratives corresponded to the Danish Cultural Life Script across groups, although the correspondence was greater for future than past narratives. The influence of Cultural Life Script holds for a wide variety of different populations.

**A-0227 Collective future thinking: The role of event specificity, perceived agency, and identity**
Meymune Topcu, William Hirst
New School for Social Research, New York, NY, USA
This talk investigates the relation between remembering the collective past and imagining the collective future, comparing it with episodic future thinking. It was found that individuals are less specific when imagining their nation's future compared to their personal future, although there was no such difference for remembering the personal and the collective past. The degree of agency individuals attribute to other people in controlling events was found to be a factor that could explain this difference between episodic vs. collective future thinking. The role agency plays in collective future thought is further investigated in relation to group identification and identity fusion with the group.

**A-0228 Social exclusion facilitates mnemonic convergence on conspiratorial information**
Alin Coman, Damaris Graeupner

Princeton University, Princeton, NJ, USA
Narratives, like viruses, spread through human communities. Some become widely shared among community members, while others only propagate in small isolated clusters in peripheral sections of social networks. When it comes to the propagation of conspiracy theories scholars believe that there is something special about the individuals who endorse them. In contrast with this belief we show that a simple social exclusion manipulation leads: 1) Princeton students to perceive ambiguous scenarios as conspiratorial, and 2) online groups of individuals to discuss and, as a consequence, converge on, conspiratorial information. We discuss the implication of these findings for emerging narratives of public events in times of crisis.

**A-0229 Living in history: How (and when) collective transitions organize autobiographical memory**

Norman R. Brown
University of Alberta, Edmonton, Alberta, Canada
For several years, my colleagues and I have been examining the mnemonic impact of war, terrorism, political upheaval, and natural disasters in order to understand when and why autobiographical and historical memory become intertwined. This research links the two by demonstrating the existence of historically-defined autobiographical periods (H-DAPs) and indicates that it is personal impact, not historical importance which determines whether public events organize autobiographical memory. More specifically, we have found that H-DAPs form only when public events act as collective transitions, bringing about wide-spread, profound, and enduring changes to the fabric of daily life. Evidence for these claims comes from some 30 samples collected in 16 countries. In this talk, I summarize this evidence and discuss its implications.

# Shaping memories via reactivation

**S0014 session**
Wednesday, 20 July 2016 | 12:00 - 14:15 | Room 2
**Chair/Organizer: Maria Wimber, Chris Bird**
**Discussant: Yadin Dudai**

**A-0135 Consolidation of lifelike events via active rehearsal**
Chris Bird
University of Sussex, UK
Consolidation mechanisms may involve reactivation of the memories. Additionally, reactivation may transform memories from being imbued with rich, sensory details to being more generic and gist-like in nature. We investigated memory consolidation for lifelike events by asking people to watch and rehearse short video clips. Qualitatively, video descriptions were detailed, but remarkably similar across rehearsal sessions, suggesting some degree of memory transformation. However, patterns of MRI activity, compared using representational similarity analyses, were highly consistent across encoding, immediate rehearsal and 1-week delayed rehearsal sessions. This suggests that re-instantiation of neural activity within a network of brain regions supports the consolidation of lifelike events. We found no evidence for brain regions supporting separate “transformed” memory representations.

**A-0131 Active retrieval, binding, and the structure of episodic memories**
Donna Bridge
Northwestern University Feinberg School of Medicine, Illinois, USA
Retrieval allows memory content to become temporarily active and available for binding with other information. I will describe a collection of findings indicating that, relative to other memory content, actively retrieved memory content is disproportionately bound with available information and therefore provides a powerful influence on the structure of episodic memories. Using eye-movement tracking and neuroimaging, we have shown that the hippocampus disproportionately binds retrieved memory content with other relevant information, thus influencing (1) what information will be bound (2) when binding occurs and (3) the strength of binding among the specific features that comprise an episodic memory. Episodic memories are therefore honed and structured by active retrieval in order to facilitate adaptation of memory to relevant information.

**A-0130 Neural signals of memory reactivation during sleep**
Jessica Creery, Ken Paller
Northwestern University, Illinois, USA
Sleep is an important time for memory consolidation. Whereas rodent hippocampal place cells show spontaneous neuronal replay during sleep, much remains to be learned about sleep-based mechanisms of memory, stabilization, strengthening, and integration. Here, we took advantage of the method of Targeted Memory Reactivation (TMR), whereby memories acquired during wake can be externally cued during sleep to boost post-sleep memory performance. In recent TMR studies, we monitored scalp recordings in healthy individuals and intracranial hippocampal recordings in epileptic patients. Analyses of time-locked electrophysiological responses to auditory cues presented during sleep, in the form of event-related potentials and time-frequency analyses, represent a promising approach for deciphering the critical processing that underlies sleep-based memory consolidation.

**A-0136 Hippocampal-prefrontal theta oscillations support memory integration**
Christian Doeller [1], Alexander Backus [2]
Donders Centre for Cognitive Neuroimaging, Nijmegen, Netherlands
The ability to integrate individual memories forms the basis of inferential reasoning. Considerable evidence implicates hippocampus and medial prefrontal cortex (mPFC) in memory integration. Although previous studies indicate that theta-oscillations facilitate memory, the electrophysiological mechanisms underlying memory integration remain elusive. Here, we recorded magnetoencephalography data while participants performed an inference task, and employed novel source reconstruction techniques to estimate oscillatory signals from the hippocampus. Hippocampal theta power during encoding predicted subsequent memory integration. Moreover, we observed increased theta coherence between hippocampus and mPFC. Our results suggest that integrated memory representations arise through hippocampal theta oscillations, possibly reflecting switching between encoding and retrieval states, and facilitating communication with mPFC. These findings have implications for our understanding of memory-based decision-making and knowledge-acquisition.

**A-0175 The construction of coherent event engrams across time via shared content**
Aidan Horner
Institute of Cognitive Neuroscience, London, UK; York University, UK
Event engrams are thought to represent what happened at a specific time and place. Once formed, they are recollected via hippocampal pattern completion and neocortical reinstatement. Recent research has suggested a role for the hippocampus in generalisation across events - binding separately encoded information with overlapping content to draw inferences about related material. We show that separately encoded information that shares content can be bound into an engram that is behaviourally similar to events learnt on a single trial. Further, these engrams constructed across separate trials are retrieved via hippocampal pattern completion and neocortical reinstatement. Thus, the hippocampus can construct coherent event engrams not just for single spatiotemporal instances, but also for instances separated in time, via their shared content.

**A-0128 Memory reactivation during rest promotes future learning**
Alison R. Preston
University of Texas, Austin, Texas, USA
Recent data indicate that memories are reactivated during offline rest periods, leading to better memory for reactivated content. In this talk, I will discuss our recent work showing how rest-related memory replay impacts future learning. Participants with established event memories were scanned during passive rest and during encoding of new related and unrelated episodes. Spontaneous reactivation of established memories and enhanced hippocampal–neocortical functional connectivity during rest was related to better subsequent learning, specifically of related content. Furthermore, the degree of functional coupling during rest was predictive of neural engagement during the new learning experience itself. These results suggest that through rest-phase reactivation and hippocampal–neocortical interactions, existing memories may come to facilitate encoding

during subsequent related episodes.

**A-0127 Adaptive memory up- and down-regulation via active retrieval**

Maria Wimber
University of Birmingham, UK

Recalling a particular event adaptively changes the memories surrounding this event in at least two ways: it facilitates the future retrieval of the recalled memory, but also causes forgetting of interfering memories to prevent these from competing in the future. The data presented in this talk shed light onto the neurocognitive mechanisms underlying such retrieval-mediated facilitation and forgetting. Multivariate pattern analyses suggest that facilitation of a repeatedly recalled visual memory involves reactivation of its semantic (categorical) as well as its event-unique content. Forgetting, on the other hand, is closely linked to a relatively long-lasting suppression of event-unique features in visual cortex. These findings reveal two fundamental neural mechanisms by which active retrieval shapes our memories.

# When remembering is a challenge: visual working memory and aging

**S0020 session**
Wednesday, 20 July 2016 | 12:00 - 14:15 | Room 3
**Chair/Organizer: Hubert D. Zimmer**

**A-0490 Dissociating age-related deficits in relational and conjunctive binding in visual working-memory**
Alexander Kirmsse, Hubert D. Zimmer
Saarland University, Saarbrücken, Germany
In contrast to long-term memory, the age-related association deficit in working memory is sometimes absent and sometimes present for relational bindings (between items), whereas it is not found for conjunction binding (within item). We addressed this issue by comparing these two binding types in younger and older healthy adults in a color-shape change detection task, testing the association directly or indirectly (changed bindings were irrelevant). Although no age-related association deficit was apparent in the direct test, the indirect test showed that the two types of binding were processed differently by the age groups. We take this result as an indicator that conjunctive and relational bindings are differently affected by healthy aging even if an association deficit was absent or compensated.

**A-0491 Not dedifferentiation, but distinction in aging: reserve and decline in visual working memory and processing speed**
Iris Wiegand
University of Copenhagen, DK
The “Theory of Visual Attention” model provides mathematically independent individual parameter estimates of visual storage capacity and visual processing speed. Combining parametric assessment with neuroscientific methods revealed that - while both functions decline with aging - the mechanism underlying performance in the two parameters are dissociable: In older participants, separate ERPs indexed slowing of visual processing and preservation of storage capacity. Furthermore, right pre-frontal and right parietal tDCS affected the two functions differently. Our findings indicate that functional distinctiveness is retained, or even increased, in age-related reorganization within the fronto-parietal attention network. We now explore factors mediating individuals’ neural reserve, vulnerability to decline, and plasticity to counteract age-related deterioration.

**A-0492 Selective attention to visual working memory representations in older and younger adults**
Philip C. Ko [1], Geoffrey Woodman [2], Brandon A. Ally [1]
[1] Vanderbilt University Medical Center, US [2] Vanderbilt University, US
Visual working memory (VWM) is the ability to remember the appearance of a few objects over several seconds. Older adults tend to perform worse than younger adults on tasks requiring VWM. Why does this happen and how can it be improved? We will show how event-related potentials (ERP) and behavioral measures support the hypothesis that aging is related to reduced precision of VWM representations, and not necessarily the number of to-be-remembered objects. We will also show that selective attention to an item can improve VWM retrieval in older adults. We will then expand the discussion on selective attention to items in VWM, and how it affects the later retrieval of the attended object and non-attended objects.

**A-0494 Stuck in default mode: dysfunctional neural synchronisation in the elderly**
Paul Sauseng [1], Diego Pinal [2], Fernando Diaz [2], Montserrat Zurron [2]
[1] Ludwig-Maximilian-University, Munich, Germany [2] University of Santiago de Compostela, Spain
When the human brain is engaged in retention of information in working memory (WM) the default mode network (DMN) needs to be decoupled, and a task-relevant WM network will have to get engaged. We present EEG data describing dynamic control of neural synchronization within the DMN and a WM network: fast oscillatory brain activity in parietal brain areas is nested into slow fronto-medial brain waves. Nesting into the excitatory phase of the slow frontal oscillation leads to increased coupling; nesting into the inhibitory phase leads to decoupling. Compared to young participants, elderly show less neural synchronization within the WM network but over-engagement of the DMN during WM maintenance. This pattern can explain WM deficits in non-pathological aging.

**A-0496 Rapid forgetting over seconds in health and disease**
Masud Husain [1], Yoni Petzov [2], Nahid Zokaei [1]
[1] University of Oxford, UK; [2] Hebrew University, Jersualem, Israel;
The mechanisms underlying rapid forgetting are extremely controversial. New methods to measure the precision of visual short-term memory (VSTM) using continuous responses (rather than binary yes/no reports) provide a sensitive probe. Here we first use these techniques to examine rapid forgetting in healthy people and show that both temporal decay and interference modulate recall. Then we apply these methods to four different patient groups to reveal different signatures of deficit. We show that individuals with focal medial temporal lobe (MTL) lesions and familial Alzheimer’s disease demonstrate increased misbinding of object features held in VSTM. By contrast Parkinson’s disease (PD) patients and a population at high risk of developing PD show increased vulnerability to random corruption of VSTM over just seconds.

**A-0497 Associative working memory in ageing, MCI and Alzheimer’s dementia: episodic buffer impairment or long-term deficit?**
Roy P.C. Kessels
Radboud University & Radboud University Medical Center, Nijmegen;
Associative working memory has been found to be compromised in early Alzheimer’s disease (including MCI). However, the underlying mechanism is under debate. Some evidence suggests that a short-term binding deficit or an episodic buffer dysfunction underlies the associative working-memory deficits in these patients. Others have shown evidence that it is the long-term encoding that is impaired, resulting in a poor performance on associative memory tasks in general, even after short delays. In this talk, I will present recent neuropsychological and fMRI studies on the role of associative working memory in relation to Baddeley’s working memory model, long-term encoding, and medial-temporal lobe dysfunction, in MCI and Alzheimer patients as well as healthy individuals.

**A-0499 EEG-signatures of memory binding deficits in patients with different risks of Alzheimer’s disease**
Serge Hoefeijzers [1], Clara Calia [1], Agustin Ibañez [2] Marcos Pietto [2], Natalia Trujillo [2], Sandra Baez [2], Francisco Lopera [3], Facundo Manes[2], Sergio Della Sala [4], John Starr [4], Mario Alfredo Parra [1]
[1] Heriot-Watt University, UK; [2] Institute of Cognitive Neurology, Argentina; [3] Neuroscience Group of Antioquia, University of Antioquia, Colombia; [4] University of Edinburgh, UK

Visual short-term memory binding (VSTMB) holds cognitive marker properties for Alzheimer's disease (AD). Such a function entails information sharing between brain regions. We hypothesised that the disconnection syndrome caused by AD should hamper such mechanisms. To this aim we analysed the ERPs and brain connectivity associated to VSTMB performance in patients with different risks of AD (i.e., familial cases and sporadic cases). There was ERP evidence of physiological disruption over occipito-parietal and frontal regions associated to poor VSTMB functions in both patient groups. Brain connectivity analysis in familial cases confirmed that deficits of information sharing between these brain regions underpin such impairments. By combining behavioural and EEG data we could correctly classify 100% of FAD cases.

**A-0502 Dissociating neural correlates of memory binding functions in prodromal stages of AD**

Clara Calia [1], Sara Fernandez Guinea [2], Ana Frank [3], Javier Olazarán [4], Serge Hoefeijzers [1], Juan Antonio Hernandez Tamames [5], Juan Alvarez Linera [6], Sergio Della Sala [7], Mario Alfredo Parra [1]

[1] Heriot-Watt University, UK; [2] Complutense University of Madrid; [3] Hospital Universitario La Paz, Madrid, [4] Hospital Universitario Gregorio Marañón, Madrid, [5] University Rey Juan Carlos, Madrid, [6] Ruber International Hospital, Madrid; [7] University of Edinburgh

Memory binding functions responsible for the temporary retention of conjunctions of features and long-term associative representations are dissociable. Whereas the former remains preserved in healthy ageing, the latter declines rapidly with age. However, both functions are extremely sensitive to Alzheimer's disease (AD). The neural correlates of such dissociation are poorly understood. We recently found that both memory binding functions are affected in the prodromal stages of AD. Neuroimaging analysis (i.e., Voxel-based morphometry) revealed that associative memory impairments are accounted for by atrophy of the hippocampus whereas conjunctive binding impairments are accounted for by atrophy of areas of the ventral visual stream. We will discuss the implications of such findings for the identification of normal and abnormal variants of ageing.

# Neurocircuitry of episodic memory as revealed by neurodegenerative disorders

**S0024 session**
Wednesday, 20 July 2016 | 12:00 - 14:15 | Room 4
**Chair/Organizer: Muireann Irish**
**Discussant: Michael Kopelman**

**A-0181 Marked hippocampal atrophy without major episodic memory deficits: the paradox of semantic dementia**
Renaud La Joie, Alexandre Bejanin, Serge Belliard, Vincent de la Sayette, Francis Eustache, Béatrice Desgranges, Gaël Chételat
Unité Inserm-EPHE-Université de Caen Normandie- CHU de Caen, u1077
Hippocampal atrophy is classically associated with episodic memory deficits. However, patients with semantic dementia (SD, a clinical syndrome associated with frontotemporal lobar degeneration) harbor marked hippocampal volume loss, quantitatively comparable to that observed in Alzheimer's disease (AD), while showing an intriguing relative preservation of day-to-day episodic memory. This presentation will provide an overview of recent studies that further refine our understanding of this clinical-anatomical paradox by comparing brain alterations in patients with AD and SD. Overall, results suggest that episodic memory preservation in SD is likely related to the preservation of a posterior hippocampo-cortical network which includes the posterior cingulate and angular cortices, and which is strongly targeted by AD.

**A-0182 The relationship between episodic memory and spatial orientation in neurodegeneration**
Michael Hornberger, Maxime Bertoux
University of East Anglia, Norwich, United Kingdom
In the proposed talk, we will present episodic memory and spatial orientation data in Alzheimer's disease (AD) and frontotemporal dementia (FTD) patients. The data presented will demonstrate that AD and FTD patients can show similar levels of episodic memory dysfunction with equivalent hippocampal damage at presentation and with disease progression. By contrast, spatial orientation contingent upon retrosplenial/medial parietal cortex regions is exclusively impaired in AD, but not in FTD. These findings, across multiple experiments, suggest that specific spatial orientation processes are not dependent on the hippocampus, corroborating animal and functional neuroimaging studies. The findings further highlight a new avenue of using retrosplenial-specific deficits as potential biomarker and outcome measures for Alzheimer's disease pathology.

**A-0183 Disrupted interaction between memory and self in patients with Alzheimer's disease**
Sarah Genon [1,2], Eric Salmon [1], Fabienne Collette [1], Christine Bastin [1]
[1] Cyclotron Research Centre, Belgium; [2] Jülich Research Centre, Germany
In humans, self and memory processes interact as reflected by the self reference (SRE) and self reference recollection effects (SRRE). However, in patients with Alzheimer's disease (AD), this relationship can be significantly disrupted. Our work reveals impaired SRE and SRRE in AD for recognition of adjectives previously judged for self-relevance, as well as for recall of names of people previously linked to the self. For both materials, a qualitative impairment of the recollective experience for self-related items is also observed in AD. Neuroimaging studies suggest that reduced SRE is related to decreased grey matter volume in the lateral prefrontal cortex (lPFC). Thus, retrieval of recent self-related memories is impaired in relation to altered high-order frontally-mediated processes in AD.

**A-0184 Autobiographical memory or episodic memory highly related to the self: A double dissociation in neurodegenerative diseases.**
Pascale Piolino
INSERM S894, Center of Psychiatry and Neurosciences, University Sorbonne Paris Cité, Paris, France.
We propose to investigate the issue of remote episodic memories in neurodegenerative diseases by comparing patients with Alzheimer's disease and semantic dementia. Clinical, experimental, and neuroimaging data of autobiographical memory will demonstrate that the autobiographical memory impairment varies according to the nature of the memories under consideration and the locus of cerebral dysfunction. The data will also be discussed with the purpose of shedding light on the relationships between remote episodic memories and the self within these two neurodegenerative diseases.

**A-0185 Alterations in autobiographical memory in Posterior Cortical Atrophy**
Samrah Ahmed [1], Ian Baker [1], Sian Thompson [1], Masud Husain [2], Chris Butler [1]
[1] Nuffield Department of Clinical Neurosciences, University of Oxford, UK; [2] Department of Experimental Psychology, University of Oxford, UK.
Posterior cortical atrophy (PCA) represents a rare degenerative disorder characterised by atrophy to predominantly occipital regions of the brain, resulting in the progressive disruption of visual processing. To our knowledge, no study has explored the capacity for autobiographical memory retrieval in PCA and it remains unclear to what extent retrograde memory is altered in this syndrome. Here, we present preliminary findings from an ongoing study investigating autobiographical memory performance in PCA and Alzheimer's disease using the Autobiographical Interview. Despite relatively preserved MTLs, PCA patients display subtle alterations in the provision of contextual details. Our findings suggest that damage to posterior regions of the brain disrupts access to visual information integral to the ABM trace.

**A-0186 Neurocognitive mechanisms underlying future thinking – insights from the dementias**
Muireann Irish [1,2]
[1] University of New South Wales, Sydney, Australia; [2] Neuroscience Research Australia, Sydney, Australia.
Episodic memory dysfunction represents a hallmark clinical feature of many dementia syndromes. Mounting evidence, however, reveals striking deficits in the ability to envisage the future in dementia, providing key insights into the neurocognitive mechanisms supporting future thinking. Impaired capacity for prospection appears closely connected to episodic memory dysfunction in AD, attributable to predominantly posteromedial brain atrophy. In contrast, medial temporal and frontal lobe atrophy underpins future thinking alterations in frontotemporal dementia. Finally, the syndrome of semantic dementia has clarified the pivotal role of semantic memory for simulating the future. While deficits in prospection appear to be a ubiquitous feature of dementia, the underlying neurocognitive mechanisms mediating these impairments differ markedly contingent on the locus of pathology in each patient group.

**A-0187 Episodic future thinking in Parkinson's disease – the role of executive function**
Stefania de Vito [1], Nadia Gamboz [2], Maria A. Brandimonte [2], Paolo Barone [3], Marianna Amboni [3], Sergio Della Sala [4]

[1] School of Psychology, University of East London, UK; [2] Suor Orsola Benincasa, Naples, Italy; [3] Federico II University, Naples, Italy; [4] University of Edinburgh, Scotland.

The capacity to imagine potential future scenarios in Parkinson's disease (PD) was investigated. Thirty-one PD patients were required to mentally re-experience and pre-experience autobiographical events, with the inclusion of a non-temporal condition and a description task. Significant impairments in foresight were observed in the PD group, despite intact retrieval of autobiographical episodes from the past. Notably, the ability to construct atemporal scenes and the ability to generate scene-related details when describing current settings were preserved in PD, pointing towards an exclusive deficit in future-oriented thinking in these patients. Compromised future thinking performance in PD likely reflects poor executive control in isolation from other related cognitive deficits, such as retrieving the past, imagining atemporal scenes and describing current settings.

# Neural Basis of Prospective Memory

**S0058 session**

Wednesday, 20 July 2016 | 12:00 - 14:15 | Room 5

**Chair/Organizer: Nicolas Rothen, Beat Meier**

**A-1008 The Involvement of Brodmann Area 10 in Prospective Memory Retrieval Mode**

Melissa J. Guynn

New Mexico State University, Las Cruces, NM, USA

Retrieval mode (a neurocognitive set to treat environmental stimuli as retrieval cues) is a historic theoretical construct in the retrospective memory literature, and it has recently been invoked in a theory of how some prospective memory tasks are accomplished (i.e., those that benefit from the allocation of limited attentional resources and thus interfere with an ongoing task in which they are embedded). We review behavioral evidence and evidence from functional neuroimaging that indicate that a particular region of prefrontal cortex (Brodmann area 10) appears to play an important role in both prospective and retrospective retrieval mode. Theoretical implications are discussed.

**A-0985 Right Ear Advantage in Prospective Memory: the retrieval strategy makes the difference**

Nicolas Rothen, Beat Meier

Institute of Psychology and Center for Cognition, Learning and Memory, University of Bern, Switzerland

We tested for the effect of lateralized attention on prospective memory performance in a dichotic listening task. The ongoing task consisted of a semantic decision task during which the participants were presented with different words on both ears. Participants were required to focus on the words presented on the left or right ear and to make an abstract-concrete decision. The prospective memory task consisted of the detection of animal words which could appear on both sides. Analysing individual cost profiles revealed that a spontaneous retrieval strategy was associated with a right ear advantage in contrast to strategic monitoring. The finding suggests that different retrieval strategies can be differentially affected by the structural organisation of the brain.

**A-1023 Remembering delayed intentions: Separable roles of lateral and medial rostral prefrontal cortex**

Sam Gilbert

University College London, UK

Despite evidence implicating rostral prefrontal cortex in our ability to fulfil delayed intentions, its role is not well understood in information-processing terms. In this talk I will describe studies using univariate and multivariate fMRI, along with evidence from computational modelling, seeking to distinguish brain regions representing the content of delayed intentions from regions playing a “content-free” role. Results show that despite medial rostral prefrontal cortex showing an overall reduction in BOLD signal during intention maintenance, patterns of activity within this region carry task-relevant representational content. This may be explained by theta-band oscillatory activity. By contrast, lateral rostral prefrontal cortex shows an increased BOLD signal but evidence is consistent with a content-free role.

**A-0988 Motivational effects on the processing of delayed intentions in the anterior prefrontal cortex**

Christine Stelzel [1,2,3,4], Jovita Bruening [1,5], Vera U. Ludwig [1,2,4], Lena M. Paschke [1,2,4], Henrik Walter [1,2,4]

[1] Department of Psychiatry and Psychotherapy, Charité Universitätsmedizin Berlin, Germany [2] Berlin School of Mind and Brain, Humboldt-Universitaet zu Berlin, Berlin, Germany [3] International Psychoanalytic University, Berlin, Germany [4] Berlin Center for Advanced Neuroimaging, Berlin, Germany [5] Technische Universität, Berlin, Germany

Motivational significance improves retrieval of delayed intentions but little is known about the underlying brain mechanisms. We investigated whether motivational incentives modulate intention processing in the anterior prefrontal cortex (aPFC) in a transient or in a sustained manner, using a mixed blocked and event-related fMRI design. Monetary incentives improved intention retrieval and ongoing task performance. Sustained activity in rewarded compared to non-rewarded blocks was present in fronto-parietal regions including left lateral aPFC, being associated with greater behavioral improvements. Additionally, individual differences in reward-related benefits were related to transient signal increases in right lateral aPFC specifically during intention encoding. Hence, mobilizing aPFC processes during encoding of intentions seems crucial for successful intention retrieval in addition to general increases in processing effort.

**A-0986 Responding habitually to a prospective memory task enhances ease of retrieval: Evidence from ERPs**

Beat Meier[1,2], Stefan Walter[1,2], Sibylle Matter[1], Alodie Rey-Mermet[3], Thomas Koenig[2,4]

[1] Institute of Psychology, University of Bern, Switzerland [2] Center for Cognition, Learning and Memory, University of Bern, Switzerland [3] Institute of Psychology, University of Zürich, Switzerland [4] University Hospital of Psychiatry, Bern, Switzerland

In a habitual prospective memory task, an intention must be performed regularly and frequently in response to a particular event. Everyday examples include flushing the toilet after use, closing the door when leaving the flat, or taking medication according to a prescription scheme. Here, we investigated the neural correlates of habitual prospective memory in a series of ERP-experiments. The main result is that when a task becomes habitual, the prospective positivity, an ERP-component related to the ease of retrieval is enhanced. Thus, with repeated retrieval the prospective memory task may be integrated into the ongoing task. In general, the results indicate that episodic and habitual prospective memory tasks differ in their neural underpinnings.

**A-0963 The role of sleep for successful prospective remembering**

Susanne Diekelmann

University of Tübingen, Tübingen, Germany

While sleep is known to consolidate memories of past events, the role of sleep for prospective memory is less well understood. We have shown that sleep selectively facilitates the consolidation of memories for which subjects expect a retrieval test after sleep. Sleep also improves the ability to execute intended actions after a delay of two days, and this improvement specifically depends on slow wave sleep rather than rapid eye movement (REM) sleep. Sleep thereby enhances both the prospective and the retrospective component of prospective memory and facilitates spontaneous-associative retrieval processes. Finally, the sleep effect for prospective memory vanishes once the intention is completed before sleep, indicating that sleep benefits memories only as long as they are relevant for future behavior.

**A-0983 The effect of subthalamic nucleus deep brain stimulation on prospective memory functions in Parkinson’s disease**

Gyula Demeter [1,2], Péter Pajkossy [1,2], Ágnes Szőllősi [2], Ágnes Lukács [2], István Valálik [3], Mihály Racsmány [1,2]
[1] Hungarian Academy of Sciences, Frontostriatal System Research Group, Budapest, Hungary; [2] Budapest University of Technology and Economics, Department of Cognitive Science, Budapest, Hungary; [3] St. John's Hospital, Department of Neurosurgery, Budapest, Hungary
The aim of the study was to assess the effect of bilateral deep brain stimulation (DBS) of subthalamic nucleus (STN) on prospective memory (PM) functions involving thirteen PD patients with DBS implantation (DBS group) and 15 PD wait-listed patients (control group). Tasks of executive functions and an event-based PM task were applied. Each task was administered twice: before and after surgery in the DBS group with the stimulators on and with a similar time interval between the two task-administration points in the control group. The DBS group showed a significant decline on semantic verbal fluency task and a decreased execution cost score of the PM task after surgery, suggesting possible effects of STN DBS on PM-related frontosriatal networks.

**A-0971 Neurocognitive mechanisms of prospective memory: The influence of cue features.**
Giorgia Cona [1,2], Cristina Scarpazza [1], Giuseppe Sartori [1], Morris Moscovitch [3], Patrizia Bisiacchi [1]
[1] Department of General Psychology, University of Padua, Padua, Italy [2] Department of Neuroscience, University of Padua, Padua, Italy [3] Department of Psychology, University of Toronto, Toronto, Canada
A growing number of studies have investigated the neural basis of Prospective Memory (PM). In two meta-analyses of neuroimaging studies, we sought to identify the brain regions that are consistently involved to accomplish PM tasks, exploring their functional role and their differential recruitment depending on the features of the PM cue. In this talk, I will present the ‘Attention to Delayed Intention (AtoDI)’ model, formulated on the basis of the findings of the first meta-analysis. Then, I will describe the findings of the second meta-analysis, which revealed that distinct neural processes underlie the execution of delayed intentions depending on whether the cues associated with such intentions are focal to ongoing activity or not (cue focality).

# Theoretical and legal issues related to autobiographical belief and recollection

**S0013 session**
Wednesday, 20 July 2016 | 12:00 - 14:15 | Room 6
**Chair/Organizer: Henry Otgaar**
**Discussant: Mark L. Howe**

**A-0141 The behavioral effects of undermining belief for true and false memories**
Henry Otgaar [1,2], Mark L. Howe [2,1], Jane Wang [1], Georgiana Moldoveanu [1]
[1] Section Forensic Psychology, Maastricht University [2] City University London, UK
We will present findings related to the behavioral effects of undermining belief for true and false memories. Participants received DRM-wordlists and a recognition task. Next, participants' belief was undermined by giving them feedback about true and false items. We succeeded in eliciting nonbelieved true and false memories. Then, participants were involved in a perceptual closure task. Here, participants received degraded visual representations of words (e.g., false/true) that became clearer over time. Participants had to identify them as fast as possible. We found that undermining belief had contrasting consequences for true and false memories: Nonbelieved true memories were identified more slowly whereas nonbelieved false memories were identified more quickly. Our results imply that belief differentially affects true and false memory.

**A-0142 Memory and belief in occurrence as determinants of behavior and decision**
Giuliana Mazzoni
University of Hull
Recent research on false memories has demonstrated that remembering the personal past has two major components: retrieving a mental content (i.e. memory) and believing that the remembered event had indeed occurred (i.e. belief) (Mazzoni et al, 2010). Until now, researchers have been convinced that memory is the determinant of future decisions and behaviors. I show that when there is an incongruency between the memory for a personal event and the belief in its occurrence (e.g. nonbelieved memories), the memory is discounted and superseded by the belief as the determinant of decisions and behavior. The experiments also show some boundary conditions of this effect. The results are discussed in terms of the theoretical relationship between recollection and belief within memory.

**A-0143 Relinquishing belief in false memories leads to less efficient problem-solving behavior.**
Jianqin Wang [1], Henry Otgaar [1,2], Mark L. Howe [2,1], Tom Smeets [1]
[1] Section Forensic Psychology, Maastricht University [2] City University London, UK
The present experiments examined the effects of false beliefs and memories on behaviour. In Experiment 1, we examined whether NBMs affect problem-solving behavior. False memories were elicited using the Deese/Roediger-McDermott (DRM) paradigm. Then participants' belief was undermined by providing them feedback about false items. We found that undermining belief for false memories led to fewer problems solved.. In Experiment 2, a similar procedure was used except that some participants solved the problems one week after the feedback. Again, our results showed that, relinquishing belief for false memory resulted in lower problem solution rates. This effect persisted after a 1-week delay. In conclusion, the current experiments suggest that, for false memories, belief is the active agent in problem-solving behaviour.

**A-0144 Challenging beliefs does not lead to memory omissions**
Andrew Clark [1], Lorraine Hope [1], Henry Otgaar [2], James Ost [1]
[1] University of Portsmouth, UK [2] Section Forensic Psychology, Maastricht University
Researchers have speculated that nonbelieved memories (where belief in a recollection is attenuated) could be the precursor to making a memory omission error. Research has also shown that belief is most often attenuated following some kind of social feedback (i.e., when people are told that an event did not occur). In two experiments, participants' recollections of items (Expt. 1) or actions (Expt. 2) were challenged by either a confederate (Expts. 1 & 2) or by the experimenter (Expt. 2). Our results showed that although challenging recollections indeed resulted in memory omissions, relatively few of these omissions met the criteria for a nonbelieved memory.

**A-0145 Subjective impact of the loss of personal memories: An examination of nonbelieved memories**
Chantal Boucher, Alan Scoboria
University of Windsor, Canada
Nonbelieved memories (NBM) are a counterintuitive phenomenon in which vivid recollective characteristics are present for autobiographical events that are no longer believed to represent genuine past occurrences. We examined individuals' (N=320) reports of whether and how the loss of belief and development of a NBM impacted them. In 86% of cases participants described experiencing one or more forms of impact at the time, and 65% described enduring effects. Types of impact spanned a variety of themes: cognitions about the event, beliefs about general memory ability, changes to self-views, changes to social interactions, changes to behavior, and emotional impact. A sense of personal loss was often mentioned, and some people expressed relief at the loss of the memory.

**A-0146 Intrapersonal and interpersonal outcomes resulting from the social invalidation of personal memories**
Alan Scoboria, Lauren Wysman
University of Windsor, Canada
In this talk I review a model that predicts that two forms of cognitive dissonance result when a person receives disconfirmatory social feedback about a vivid memory. The discrepancy between the memory and the feedback leads to intrapersonal dissonance, and a decision to maintain or reduce belief in the memory. The social disagreement induces interpersonal dissonance, and a decision to agree or disagree with the challenger. I describe a study in which 285 MTurk workers wrote about a time that a memory was challenged. A majority reported four model-consistent outcomes: maintaining belief, expressing disagreement; reducing belief, expressing agreement; maintaining belief, expressing agreement; or reducing belief, expressing disagreement. I discuss predictors of these outcomes.

# New Perspectives on Childhood Memory

**S0054 session**
Wednesday, 20 July 2016 | 12:00 - 14:15 | Room 7
**Chair/Organizer: Sami Gülgöz, Qi Wang**
**Discussant: David B. Pillemer**

**A-0820 The "veil" of childhood amnesia: A 4-year prospective investigation of when it falls**
Patricia Bauer, Marina Larkina
Emory University
Common parlance for the phenomenon of childhood amnesia is in terms of its "offset," implying that early in life, few if any autobiographical memories are formed. Yet contemporary developmental research demonstrates that even young children remember the events of their lives, sometimes retaining them over long periods before they eventually disappear behind Freud's "veil" of childhood amnesia. In a 4-year prospective study, we examined rates of forgetting of autobiographical memories for children on either side of the boundary of the onset of childhood amnesia (4 and 8 years) and at the inflection point (6 years). Rates of forgetting varied not only by age, but as a function of the coherence of initial memory reports and the support for later recall.

**A-0822 Where does my past begin? Children dating earliest childhood memories**
Qi Wang [1], Carole Peterson [2]
[1] Cornell University, Ithaca, NY, USA; [2] Memorial University of Newfoundland, St. John's, Canada
Theories of childhood amnesia have been based on the assumption that age estimates of earliest memories are generally accurate. This assumption is further reinforced by problematic methodological and analytical approaches in studies that intended to verify the veracity of memory dating. In a series of cross-sectional and longitudinal studies, we examined the dating of earliest childhood memories among preschool children through adolescents. We found that children of all ages systematically postdated their earliest memories, in comparison with the age estimates provided by their parents or by themselves previously. As a result, the actual age of earliest memory may be substantially earlier than what is commonly believed at 3.5 years. These findings provide new theoretical insights into childhood amnesia.

**A-0825 Manipulating age in earliest memories**
Ineke Wessel, Theresa Schweig, Rafaële J.C. Huntjens
University of Groningen, Netherlands
We examined the malleability of the estimated age in undergraduates' earliest memories. In study 1, vignettes containing examples about age 2 rendered earlier ages than examples referring to age 6. Study 2 showed that eliciting self-relevant or public event knowledge from participants' preschool years prior to retrieval rendered similar average ages, which were earlier than in memories retrieved after a no-age control task. In addition, the results of both studies fuel speculations that age estimates vary across memory types (earlier snapshots versus later narratives) and suggest that narratives might be more sensitive to age manipulations than snapshots. Taken together, the results add to the growing literature indicating that the average age in first memories is more flexible than previously thought.

**A-0826 Consistency of earliest memories**
Berivan Ece [1], Burcu Demiray [2], Sami Gulgoz [3]
[1] MEF University, Istanbul, Turkey; [2] University of Zurich, Switzerland; [3] Koc University, Istanbul, Turkey
We explored consistency when participants were asked for earliest memories at two different times. Participants reported their earliest memories, age at the time, and event qualities such as importance, vividness, perspective, rehearsal, emotional valence and intensity. About 2 years later, the same participants reported their earliest memories and rated them. They were asked to remember whether it was the same event and then they were shown their earlier response and asked to verify similarity. Results demonstrated that although they were mostly unsure about which event they had reported, when they were shown the previous response about 2/3 of the participants confirmed these were the same earliest memories. Recollections were compared in terms of age at event and event qualities.

**A-0828 A Survey of Earliest Memories**
Shazia Akhtar, Martin Conway
City University London, UK
In a large-scale survey of earliest memories over 6000 respondents described, dated, and provided memory perspective (field vs. observer) and attachment type (secure, fearful, dismissive, and preoccupied). Very Early Memories (VEMs), 3 years and below, had most observer perspective memories and these gradually decreased for older earliest memories that were progressively dominated by field perspective memories. Linguistic analysis found that VEMs contained reliably fewer emotion words than older memories. There were no effects of attachment type. These findings show that VEMs do not have the same characteristics of older earliest memories and this calls into account their status as memories.

**A-0829 Socio-historical development and AM: Comparing two generations in three countries**
Manuel L. de la Mata Benítez [1], Radia Antalíková [2], Andrés Santamaría [1], Mercedes Cubero [1], Samuel A. Sanchéz [1], Tia G. B. Hansen [2]
[1] Universidad de Sevilla, Spain; [2] Aalborg University, Denmark
Cross-cultural research on AM has focused on comparing individuals and groups with different models of self-construal. In contrast, less attention has been paid to the influence of socio-historical changes in AM and self-construal. Our study analyzes this influence by comparing two generations in three European countries with different recent history of changes: Slovakia (from communism to capitalism and democracy), Spain (from dictatorship to democracy), and Denmark (without such dramatic changes).The participants were asked to narrate their earliest memory. The memories were analyzed with a new coding system based both on Bruner's distinction between the landscapes of action and consciousness and Kagitcibasi's model of autonomy and relatedness. The results of the analyses will be presented at the conference.

**A-0830 Unique influence of maternal and parental attachment on earliest memories**
Sezin Oner, Sami Gulgoz
Koc University
Early interactions with primary caregivers form the bases of attachment representations. Considering the temporal overlap in the formation of

attachment schemas and early memories, we tested whether maternal or paternal attachment has effects on how individuals remember their earliest experiences. Participants (N = 197) reported their earliest memories and rated these memories for qualitative features associated with the event, rehearsal, and retrieval. In addition, they completed a survey assessing the attachment styles. Structural equation modeling showed that avoidance to both parents resulted in high psychological distance associated with the earliest memory. However, reminiscing patterns in the family fully mediated this effect. Maternal anxiety predicted retrieval characteristics and this effect was mediated by the rehearsal characteristics.

# Working memory II

**I082 session**

Wednesday, 20 July 2016 | 12:00 - 14:15 | Room 8

**Chair/Organizer: Andrew Johnson**

**A-0526 Measuring the interplay of long-term memory and working memory as they control attention**

Geoffrey F. Woodman, Robert M. G. Reinhart
Vanderbilt University, Psychology Department, Nashville, TN 37240, USA

Theories of attention propose that working memory controls how attention is focused on information from our environment. However, our recent work using human event-related potentials (ERPs) and brain stimulation suggests that long-term memories may be the dominant force in controlling attention. Specifically, we find neural signatures of working memory are only observed when the task-relevant features change from moment to moment. When a subject searches for the same object for several seconds control is rapidly handed off to long-term memory. Converging evidence from transcranial direct-current stimulation indicates that long-term memories can even have rapid effects, allowing us to change the focus of attention within one trial.

**A-0561 Did you really see that face before? Exploring false memories for famous faces using the DRM paradigm**

Ashok Jansari [1], Yanic Seide [1], Duncan Windsor [1], Jessica Steele [1], Narinder Kapur [2]
[1] Goldsmiths, University of London, London, UK; [2] University College London, London, UK

False memories for verbal information has been extensively studied using the Deese-Roediger-McDermott (DRM) paradigm but to our knowledge this has never been applied to faces. Thirty participants studied 25 famous faces followed by a yes/no recognition test 30minutes later which consisted of targets, the faces of 25 individuals closely related to them and 25 unrelated individuals from the same category. We found a significantly higher rate of false-alarms for the close-associates than for the distant-associates ($t(29)=3.37$, $p=0.002$). We also found a significant difference in familiarity ratings to 'yes' responses ($F(2,26)=19.3$, p

**A-0564 Working memory, executive control, and working metacognition in Greek-Albanian bilingual children: Do socioeconomic factors matter?**

Zoe Bablekou [1], Smaragda Kazi [2], Elisavet Chrysochoou [3], Elvira Masoura [1]
[1] Aristotle University of Thessaloniki, Thessaloniki, Greece; [2] Panteion University of Social and Political Sciences, Athens, Greece; [3] The University of Sheffield International Faculty, City College, Thessaloniki, Greece

Data is reported from a Thales research program, co-financed by the European Social Fund and Greek national funds. Our aims were to investigate (1) the so-called "bilingual cognitive advantage" (superior working memory and executive control performance) in bilingual Greek-Albanian children, 8-12 years, when socioeconomic factors are controlled for, (2) the effect of educational context on the bilingual benefit, and (3) working metacognition operations in these participants. Three groups participated: (a) monoliterate bilinguals (exposed to Albanian within the family/community setting only), (b) biliterate bilinguals (formal education in both languages), and (c) monolinguals speaking Greek. No differences were observed. Our evidence indicates that the bilingual cognitive advantage depends on the linguistic and socioeconomic factors involved, and the type of tasks employed.

**A-0648 Taking photos does not impair memory**

Sophie Nightingale [1], Kimberley Wade [1], Derrick Watson [1], Andrew Mills [2], Rachel Zajac [2], Maryanne Garry [3]
[1] University of Warwick, UK; [2] University of Otago, New Zealand; [3] Victoria University of Wellington, New Zealand

Digitalisation is affecting the way we think, remember and behave. A recent study found that taking photos of items during a museum tour impaired memory for those items compared with when the items were only observed (Henkel, 2013). However, across six experiments, we were unable to replicate this photo-taking impairment effect. A meta-analysis of the mean difference in accuracy between the observe-only and photograph conditions in the six experiments provided an estimated effect size of -0.01 [-0.05, 0.03]. Furthermore, we found that zooming in to photograph part of an item resulted in a greater proportion of correctly recognised items compared with observed only items -0.1 [-0.13, -0.07]. The findings suggest that there is no memory impairment associated with taking photos.

**A-0658 Long-Term Consequences of Correct and False Recognition**

Matthew Sabia, Almut Hupbach
Lehigh University, Bethlehem, Pennsylvania, USA

Visual recognition memory is excellent under some circumstances and error-prone in others. Subjects often falsely recognize items that are similar to previously encountered targets, particularly when the targets are not present at test. We explored how initial false recognitions vs. correct rejections affect target recognition at a second, delayed test. In a series of experiments, we found that subjects can easily recover from gist-based false recognitions when provided with the necessary retrieval cues at a later test. Surprisingly, however, initial correct rejections bias memory performance toward rejection, such that over time, rejections generalize to targets. These studies isolate important factors influencing recognition and memory fidelity over time.

**A-0680 Distortion of memories for the choices as a result of misinformation verbalization**

Valeria A. Gershkovich
Saint Petersburg State University, Saint Petersburg, Russia

It was shown that people explained the reasons for making the choices they in fact had never made. We argue that such verbalizations distort participant's memories for their choices. We conducted several studies where the situation of choice was modeled. We varied the instruction for choice and explicitness of choice criteria. Participants were presented with the alternatives and were instructed to choose one of them. Afterwards participants explained their choices, but misinformation was inserted: participants were presented with the unchosen alternatives. After verbalization stage participants were presented with the alternatives once again and were asked to repeat their choices. Results indicate that participants memories are distorted unless they are made based on explicit criteria. Supported by SPbSU (grant № 8.38.287.2014)

**A-0700 Characteristics of non-verbal visual Hebb repetition learning**

Andrew J. Johnson, Artur Dygacz, Christopher Miles
Department of Psychology, Bournemouth University, UK

Three experiments examine the Hebb repetition effect with non-verbal visual stimuli. Consistent with verbal stimuli (Page, Cumming, Norris, McNeil & Hitch, 2013), Hebb repetition learning was more pronounced when there was no stimulus overlap between the filler and Hebb trials (Experiment 1). In addition, under conditions of no stimulus overlap, learning persisted when the repetition interval was increased to six trials (Experiment 2). Experiment 3 demonstrated that learning of the Hebb sequence was enhanced by, although not dependent upon, repetition of the same motor response for retrieval of the Hebb sequence. These experiments show close similarities between verbal and non-verbal visual Hebb repetition learning and support a cross-modal commonality of function in the learning of sequences.

# Keynote session VII

**K7 session**

Wednesday, 20 July 2016 | 14:25 - 15:25 | Room 1

**Chair/Organizer: Lynn Nadel**

**A-1060 KEYNOTE LECTURE: The MTL in memory, perception and emotion: The promiscuous hippocampus**

Andrew Yonelinas

University of California, Davis

Our ability to remember the important events that make up our lives is critically dependent on the medial temporal lobe (MTL). More recent work, however, has suggested that different subregions within the MTL may support distinct mnemonic processes and that they may play important roles in cognitive tasks beyond traditional tests of long term episodic memory. I will describe work showing that the hippocampus plays a central role in binding together and subsequently recollecting the different aspects that make up an episode or event, whereas other regions such as the perirhinal cortex can support familiarity-based memory discriminations even when recollection fails. In addition, I present evidence that the hippocampus is involved in supporting short-term memory and even visual perception, when those tasks involve high-resolution or complex bindings. I will then focus in the unique role of emotion in episodic memory and show that the amygdala supports recollection of emotional bindings that exhibit relatively slow forgetting compared to hippocampal bindings. Finally, I will examine the effects of acute stress on different MTL regions and present data showing that post-encoding stress can rescue memory from the effects of forgetting by acting as a mnemonic filter.

# Keynote session VIII

**K8 session**

Thursday, 21 July 2016 | 08:30 - 09:20 | Room 1

**Chair/Organizer: Mihaly Racsmany**

**A-1065 Electrophysiological biomarkers of episodic memory**

Michael J. Kahana
University of Pennsylvania

Human memory is highly variable across items and lists. To uncover the neural correlates of this variability we examine recordings from indwelling electrodes as neurosurgical patients studied and subsequently recalled word lists. These data have revealed that both narrow-band brain oscillations and broad-band power fluctuations recorded during study predict subsequent recall. Here we report multivariate analyses that reveal a widely distributed topography of high-frequency activity (70-100Hz) during memory encoding that accurately predicts subsequent recall. If variability in network physiology accounts for variability in behavior, we should be able to modulate the electrophysiology to alter behavior. We thus electrically stimulated hypothesized memory structures during the encoding a subset of memoranda in a delayed recall task. Stimulation produced a broad range of behavioral outcomes along the axis from impairment to facilitation. This variability in behavioral response turned out to be highly predictable on the basis of the multivariate biomarkers described above. Stimulation was most likely to improve memory when the biomarker signaled poor memory and it produced the greatest impairments when the biomarker signaled good memory. Across the regions stimulated, the stimulation-induced change in the multivariate biomarker predicted whether memory would be improved or impaired by focal electrical stimulation.

# A retrieval-specific mechanism of adaptive forgetting: from neural instantiation to social consequences

**S0030 session**
Thursday, 21 July 2016 | 09:30 - 11:30 | Room 1
**Chair/Organizer: Alin Coman**
**Discussant: Michael C. Anderson**

**A-0538 A species-general, retrieval-specific mechanism of adaptive forgetting in the mammalian brain**
Pedro Bekinschtein [1], Noelia Weisstaub [1], Francisco Gallo [1], Michael Anderson [2]
[1] Institute of Physiology and Biophysics, IFIBIO "Houssay," CONICET and University of Buenos Aires Medical School, Buenos Aires, Argentina. [2] MRC Cognition and Brain Sciences Unit, Cambridge, UK. Behavioural and Clinical Neurosciences Institute, Cambridge, UK.
In the last two decades a growing literature with human participants has revealed adaptive forgetting mechanisms that actively impair interfering memories via inhibitory control. Here we report an animal model of adaptive forgetting that establishes that its central theoretical properties are conserved across species. Using spontaneous object recognition, we found that when rats selectively retrieved a memory of an object encountered in a particular context, it dramatically impaired competing memories of other objects encountered in that context. Critically, consistent with the inhibitory control hypothesis, this retrieval-induced forgetting was competition-dependent, cue-independent, long-lasting, and reliant on control mechanisms mediated by the medial prefrontal cortex. These findings provide an animal model to study of circuit-level, cellular and molecular mechanisms of inhibitory control.

**A-0539 The temporal dynamics of retrieval competition: ERP correlates of competitor reactivation during retrieval practice**
Robin Hellerstedt, Mikael Johansson
Lund University
Long-term memory retrieval depends on the interaction between retrieval cues and stored memory traces. Multiple memory traces that are associated with the same retrieval cue will reactivate and compete for retrieval upon presentation of the cue. We investigated the temporal dynamics of such retrieval competition. By combining electrophysiological measures of brain activity with a sequential cueing paradigm, we isolated competitor reactivation from retrieval of the target memory. The event-related potential results revealed that competitor reactivation is reflected in an early midfrontal effect (cf. FN400), whereas target retrieval is reflected in a later positive slow wave. Importantly, only the ERP correlate of competitor reactivation predicts ensuing retrieval-induced forgetting of the competitors, which is consistent with predictions from the inhibitory control account.

**A-0541 The two faces of selective memory retrieval in social groups**
Magdalena Abel, Karl-Heinz T. Bäuml
Regensburg University
Previous research has shown that retrieval-induced forgetting extends from individuals to social groups, such that listeners who monitor the overt memory retrieval of speakers show retrieval-induced forgetting, too. Guided by recent work that demonstrated detrimental and beneficial effects of selective retrieval in individuals, the present research explored selective remembering in social groups when access to the original encoding context was manipulated. Across three experiments, selective retrieval by speakers impaired recall of listeners when context access was maintained, but improved recall when context access was impaired. The results suggest the existence of two faces of selective memory retrieval in social groups, with a detrimental face when access to the encoding context is intact and a beneficial face when it is not.

**A-0542 The effect of retrieval induced forgetting on the emergence of collective memories in small-scale communities**
Alin Coman [1], Ida Momennejad [1], Rae Drach [2], Andra Geana [1]
[1] Princeton University [2] State University of New York
A speaker's selective recounting of memories shared with a listener will induce both the speaker and the listener to forget unmentioned, related material more than unmentioned, unrelated material. This socially-shared retrieval-induced forgetting mechanism is thought to lead to the alignment of mnemonic representations between the interactants, and thus, facilitate the emergence of collective memories. To test this conjecture, participants engaged in a series of real-time, computer-mediated conversations as part of fourteen 10-member communities. We found that mnemonic convergence, measured as the degree of overlap among community members' memories, is influenced by the degree of retrieval-induced forgetting triggered during networked conversations. These findings establish the impact of micro-level local processes (i.e., retrieval induced forgetting) on large-scale social phenomena (i.e., collective memories).

# Amnesia Lab: art-science collaborative research

**S0055 session**
Thursday, 21 July 2016 | 09:30 - 11:30 | Room 2
**Chair/Organizer: Shona Illingworth, Jill Bennett**
**Discussant: Martin A. Conway**

**A-0996 Perspectives on Amnesia**
Jill Bennett [1], Shona Illingworth [2], Catherine Loveday [3]
UNSW Australia [1]; University of Kent [2]; University of Westminster [3]
Through interlocking discussion the authors will present an interdisciplinary investigation of memory loss, combining perspectives from arts and cognitive neuropsychology. Grounded in the art-science project 'Lesions in the Landscape', the presentation will demonstrate the value of creative approaches in understanding the day-to-day experience of memory loss.

**A-1067 Dementia and Grief**
Jill Bennett [1], Lynn Froggett [2]
[1] University of New South Wales, Australia, [2] University of Central Lancashire, UK
This paper reports on new methods and empirical findings from a project that evaluates the outcomes art-science collaboration for both researchers and stakeholders. In particular, it presents analysis of the engagement of a group living with dementia, focusing both on the scaffolding of memory and on the significance of aesthetic experience in everyday life.

**A-1004 Can art make us better scientists?**
Catherine Loveday
University of Westminster, London, UK
There has been huge progress in the understanding of memory and amnesia over the last sixty years, but it is important that we continue to develop innovative and effective methods of investigation. I will report on a large-scale piece of work on amnesia – the result of a close collaboration between a small team of artists and scientists, as well as an individual with experience of catastrophic memory loss. I will show how this interdisciplinary approach has provided new and rich data, which has implications for our understanding of memory structure and has formed the basis of a novel method for cognitive rehabilitation.

**A-1068 Remembering institutional abuse**
Lily Hibberd
University of New South Wales, Australia
New research into remembering institutional abuse is emerging from a collaboration between survivors of the Parramatta Girls Home, artists and psychologists, through the Parramatta Female Factory Precinct Memory Project. Survivors live with trauma arising from their institutionalisation in Australian state care and their exposure to physical, psychological and sexual abuse. This unique art-led project takes place on the former site of the Girls Home, combining film, writing, performance and traditional media to address what and how survivors might appropriately remember and communicate and how this facilitates recovery. The project offers alternatives to formal therapy, with innovative approaches for psychological practice in the field, linking art and therapy in community-based rather than clinical settings.

**A-1070 Behaviours that challenge: art, freedom and purpose in the studio**
Kate Adams
Artist and Director, Project Art Works
The principles of personalisation in supporting neurodiverse individuals with behaviours that challenge are broadly sympathetic with the responsive, sensory and considered realm of the studio. This presentation focuses on the critical importance of choice and creative control of the studio environment in fading out the effect of negative memory and response in young people with autism who require sensitive and mediated support to achieve and maintain quality of life. Using film and empirical data from on-going relationships and projects, I will evidence the positive impact of art, freedom and purpose in the studio with a range of people who otherwise experience marginalization as a result of their sensitivity to the raw stimulus of environments usually beyond their control.

**A-1071 216 Westbound**
Shona Illingworth [1], Andrew Hoskins [2]
[1] University of Kent; [2] University of Glasgow
This paper reports on how dialogues across cognitive neuropsychology, auditory neuroscience and media sociology have informed the development of 216 Westbound, an art project by artist Shona Illingworth made in collaboration with John Tulloch, survivor of the 7/7 London Bombing (2005). The project explores how an ‘embodied experience’ of the attack and of Post Traumatic Stress Disorder intersect with te complex and multiple imaginings of the city, mapping a topography of latent threat and fear onto space.

**A-1069 Memory, Mental Time Travel and The Moustachio Quartet**
Nicola Clayton, Clive Wilkins
Department of Psychology, University of Cambridge
Mental time travel allows us to re-visit our memories and imagine future scenarios. In this paper we will explore the complex relationships between memory and human experience, including examples taken from ‘The Moustachio Quartet’, a series of novels that can be read in any order. Integrating evidences from science and the arts we will explore the subjective nature of memory and mental time travel, and will argue that it has evolved primarily for prospection as opposed to retrospection. Furthermore we will question the notion that mental time travel is a uniquely human construct, and argue that some of the best evidence for the evolution of mental time travel comes from our distantly related cousins, the corvids.

# Conceptual and empirical advances in déjà vu research

**S0048 session**

Thursday, 21 July 2016 | 09:30 - 11:30 | Room 3

**Chair/Organizer: Christine E. Wells, Akira R. O'Connor**

**Discussant: Daniel L. Schacter**

**A-0477 History repeating itself: Defining pathological déjà vu**

Chris J.A. Moulin [1], Léa Martinon [2], Julie Bertrand [3], Céline Souchay [1]

[1] LPNC CNRS 5105, Grenoble, France; [2] Northumbria University, UK; [3] Centre d'épidémiologie de populations et de santé publique de Bourgogne EA 4184, France

Arnaud's case report of Louis (1896) is a critical article in the scientific discussion of the déjà vu experience. Louis believed his whole life to be a repeat of events from one year ago; exactly like our recollective confabulation patients, who believe they have watched all television programmes before, for example. We will use a new translation of Arnaud's case to outline the differences between pathological and healthy déjà vu, also using modern data from our empirical work. We argue that awareness is the critical factor in the déjà vu experience; and where there is no awareness into the false familiarity in déjà vu, it should not be described as déjà vu.

**A-0478 Déjà-rêvé ("already dreamed") induced by electrical brain stimulation**

Jonathan Curot [1,2], Fabrice Bartolomei [3,4,5], Louis Maillard [6], Agnès Trébuchon [3,4,5], Luc Valton [1,2], Emmanuel J. Barbeau [1]

[1] Centre de recherche Cerveau & Cognition, CNRS – UMR 5549, Toulouse, France; [2] Unité du Sommeil et Epilepsie, Centre Hospitalier Universitaire de Toulouse, Toulouse, France; [3] INSERM UMR 1106, Institut de Neurosciences des Systèmes, Marseille, France; [4] Faculté de Médecine, Université d'Aix-Marseille, Marseille, France; [5] Unité de Neurophysiologie Clinique, Hôpital de la Timone, Assistance Publique des Hôpitaux Marseille, Marseille, France; [6] Service de Neurologie, Centre Hospitalier Universitaire de Nancy, Nancy, France

Déjà-rêvé ("already dreamed") is a form of déjà-experience in which the subject experiences the recall of a dream he has had before. There probably is some confusion in the literature between déjà-rêvé and the "dreamy state" introduced by Hughlings-Jackson or esoteric interpretations. Only 2 cases of déjà-rêvé induced by electrical brain stimulation (EBS) have ever been reported, both barely detailed. We present 9 detailed déjà-rêvé induced by EBS during stereoelectroencephalography in 7 epileptic patients. We will discuss the relationship between déjà-rêvé and déjà-vu and whether the study of déjà-rêvé induced by EBS can be a way to study dreams.

**A-0479 The Déjà vu Illusion: Déjà vu May Bias People Toward Thinking that they Know What Will Happen Next**

Anne M. Cleary, Alexander B. Claxton

Colorado State University, USA

Research suggests that déjà vu can result from an unrecalled memory for a similar scenario to the current one being experienced. We examined whether an unrecalled memory for the unfolding of an event can prompt a sense of how a similar new event should unfold and whether this relates to déjà vu. Participants viewed videos of navigating through scenes; navigation ended with a left or right turn. Later, participants viewed an identical navigational path through novel scenes that had the same configuration; here, navigation stopped before the final turn. Participants reported a stronger sense of knowing in which direction they should turn during déjà vu than non-déjà vu states. However, this sense was illusory, as no predictive ability was demonstrated.

**A-0480 Déjà vu experiences in anxiety**

Christine E. Wells [1], Akira R. O'Connor [2], Chris J.A. Moulin [3]

[1] Sheffield Hallam University, UK; [2] University of St Andrews, UK; [3] LPNC CNRS 5105, Grenoble, France

Much research into déjà vu uses questionnaires and an individual difference approach. In this vein, we used an online questionnaire to examine déjà vu experiences in people self-reporting a clinical diagnosis of anxiety and in age-matched controls. Our reasoning was that anxiety can manifest as a dissociative experience so we hypothesised a higher level of déjà vu in an anxious group. The Anxiety Group reported a higher frequency of déjà vu. They also reported déjà vu as significantly more distressing and intrusive. The findings indicate that there are differences in déjà vu experienced by people reporting high levels of anxiety. In cases of anxiety and frequent déjà vu, high levels of dissociation may be an important distinguishing factor.

**A-0481 Role of the medial temporal lobes in familiarity assessment and déjà vu**

Stefan Kohler

Western University, Canada

It is well established that recognition of a stimulus can succeed based on item-based familiarity assessment, in the absence of successful recollection of pertinent episodic detail. I will summarize recent advances in understanding neural mechanisms in the medial temporal lobes that support familiarity, and discuss their relationship to déjà vu experiences. This will include a case study of an individual with selective impairments in familiarity assessment, which were observed after a rare surgical resection of the left anterior temporal lobe that included perirhinal cortex but spared the hippocampus. I will also discuss research in patients with temporal-lobe epilepsy that revealed links between ictal déjà vu experiences, perirhinal cortex abnormalities, and inter-ictal familiarity impairments on experimental tests of recognition memory.

**A-0482 fMRI investigation of experimentally-generated déjà vu.**

Josephine A. Urquhart, Magali Sivakumaran, Akira R O'Connor

University of St Andrews, UK

A recently-developed laboratory procedure elicits elevated déjà vu reports when DRM-generated sensations of recognition are set in opposition to evaluations of novelty derived from an additional source of information (Urquhart & O'Connor, 2014). We report an fMRI experiment conducted to i) identify and tease apart the neural substrates that support the separate and conflicting memory signals within this task; and ii) identify the neural substrates that support the identification and resolution of memory conflict characteristic of déjà vu. We discuss our findings in the context of other tasks known to generate mnemonic conflict, and the phenomenological factors that may be unique to DRM-generated déjà vu.

**A-1063 Confabulation during hypnotically suggested delusions (this presentation is not part of the S0048 symposium)**

Rochelle Cox, Amanda Barnier

ARC Centre of Excellence in Cognition and its Disorders and Department of Cognitive Science, Macquarie University, Australia

Patients with clinical delusions frequently elicit confabulated memories that support their beliefs. Sometimes these are bizarre fabrications, but they can also involve mild memory distortions or events that are misplaced in time or context. In a number of studies, we used hypnosis to experimentally induce delusions such as Fregoli delusion (the belief that strangers are people I know in disguise) and erotomania (the belief that I am loved from afar by someone). During these delusions, subjects generated confabulations that they used as evidence in favour of their beliefs. Often, the confabulations were previous experiences, which were reinterpreted in light of the delusion. We discuss these findings in terms of theories of confabulation and the reciprocal relationship between self and memory.

# Retrieval processes III

**I013 session**

Thursday, 21 July 2016 | 09:30 - 11:30 | Room 4

**Chair/Organizer: Talya Sadeh**

**A-0723 Testing the Dual-Factor Theory of Forgetting: Both Interference and Decay Matter**

Talya Sadeh [1], Jason D. Ozubko [1], Gordon Winocur [1], Yonatan Goshen-Gottstein [2], Rani Moran [2], Morris Moscovitch [1]

[1] Rotman Research Institute, Baycrest Centre, Toronto, ON, Canada; [2] School of Psychological Sciences, Tel-Aviv University, Tel-Aviv, Israel

For decades there has been controversy as to whether forgetting is caused by decay over time, or by interference from irrelevant information. We suggest that forgetting occurs because of decay or interference, depending on the underlying memory representation. Recollection-based memories are represented in orthogonal patterns and, therefore, are relatively resistant to interference from each other. Decay should be a major source of their forgetting. By contrast, familiarity-based memories are not represented in orthogonal patterns and, therefore, are sensitive to interference. I will present evidence for the Dual-factor Theory of Forgetting from recognition and recall tasks, analyzed using both frequentist and Bayesian statistics. Our theory and results place the century-old puzzle of forgetting in a coherent framework.

**A-0775 Smriti: A model for episodic and reconsolidation memory**

M. Kapardi, A. Kavitha

S.S.N College Of Engineering,Chennai,India

In recent years, many patterns are discussed for the formation of memory. The main objective of our model is to produce a pattern for semantic memory and reconsolidation. The various regions of the brain involved in formation of memory are considered as nodes of the network. The network is trained in such a way that, its initial phase will form the pattern for semantic memory and the latter for reconsolidation. The patterns formed are dependent on the plasticity mechanisms leading to the formation of the memory. The network also helps in mapping the regions involved in the formation of memory and its reconsolidation.

**A-0782 The Multiple Problems of Multiple Choice: A New Type of Negative Testing Effect**

Lauren Griffiths, Philip Higham, Helen Rackstraw

University of Southampton

We report a new type of negative testing effect, which occurs when sets of multiple-choice (MC) alternatives match between a pretest and final test, but the question stems (and correct answers) differ. Participants read four articles and either studied or were pretested on the material before an immediate or delayed final test, which included five types of question: studied, repeated, changed-stem/matched-lures, changed-stem/half-matched-lures, and new. We found a negative testing effect in both changed-stem conditions that persisted even after seven days. Our results suggest that students used the MC options as retrieval cues for correct answers rather than the questions themselves and that instructors must be cautious about precise test format if MC practice quizzes are used in classrooms.

**A-0786 Functional and structural evidence of hippocampal involvement on the Testing effect**

Jaione Arnaez-Telleria [1], Garikoitz Lerma-Usabiaga [1], Manuel Carreiras [1,2,3], Pedro M. Paz-Alonso [1]

[1] BCBL. Basque Center on Cognition, Brain and Language, Donostia-San Sebastián, Spain; [2] IKERBASQUE, Basque Foundation for Science, Bilbao, Spain; [3] Departmento de Lengua Vasca y Comunicación, UPV/EHU, Bilbao, Spain.

Although extensive behavioral evidence has demonstrated the testing effect and its robustness, the neural mechanisms underlying it remain relatively elusive. Here we sought to investigate the role of the hippocampus on the testing effect using functional and structural MRI. Thirty-seven adults studied 100 Swahili-Spanish word pairs, under repeated retrieval or repeated study conditions, and underwent MRI scanning 48 hours after encoding. fMRI results revealed that successful retrieval of information learned via retrieval practice was less dependent on regional hippocampal activation than information learned through study practice. Total left hippocampus and left CA3/4 and dentate gyrus subfield volumes predicted successful retrieval only for information learned via study practice. Our findings showed differential hippocampal involvement as a function of the learning strategy.

**A-0973 It is not that Random: What You Remember Influence Subsequent Recall**

Sezin Öner, Sami Gülgöz

Koç University, Istanbul, Turkey

Present study focused on the functional role of autobiographical memory in emotion regulation. We asked individuals to report either sad or neutral events and tested how recalling emotional events influence individuals' subsequent memory reports. Sad and neutral memories were found to differ in their influence on subsequent recall. Although valence and intensity ratings were similar, compared to neutral-memory group, sad-memory group attributed less importance to the events in the subsequent recall, but notably, they perceived these events more psychologically distant. Furthermore, we found that the more visual imagery and reliving were reported for sad memories, the more negative the subsequent recall tended to be. We argue for more complex mechanisms than the mood-congruence to determine the subsequent memory experience.

**A-0697 Post-warnings can undo stereotype-induced memory distortion**

Hartmut Blank, Lauren Rutter, Rebecca Armstrong

University of Portsmouth

Research demonstrating memory distortion is abundant, but its temporal stability is hardly explored (pointing to a default assumption that, once distorted, a memory will remain distorted). Extending demonstrations that the eyewitness misinformation effect can be undone after a post-warning about the presence of misinformation (Oeberst & Blank, 2012), the present research found that stereotype influence on memory can be similarly undone. Participants remembered details of self-descriptions of two persons who were labelled as a vicar or builder, leading to stereotype-consistent memory distortions in an initial multiple-choice recognition test (compared to a no-label condition). A week later, a post-warning that we had made up these labels eliminated the stereotype effect and restored memory for the correct details. We discuss theoretical implications.

# Key findings in Working Memory

**S0056 session**
Thursday, 21 July 2016 | 09:30 - 11:30 | Room 5
**Chair/Organizer: Geoff Ward**

**A-0975 Recalling the first thing first: List length and output order effects in immediate free and serial recall**
Geoff Ward [1], Lydia Tan [2]
[1] University of Essex; [2] City University, London
Participants who are presented with a short list of words to recall in any order, such as “House, Dog, Cup” tend to recall the words in forwards serial order, even though this was not a task requirement. This finding is present with verbal and visuo-spatial stimuli, and also under different variants of free recall, serial recall and reconstruction of order. However, this key finding arises only when participants must try to recall many of the list items; when participants must recall only one or two items, they tend to initiate recall with end of list items. Understanding the effects of list length on output order is essential for understanding the similarities and differences between different immediate and episodic memory tasks.

**A-0976 Modelling immediate serial recall performance in a macaque: A computational comparison of competitive queuing and gain-field models**
Mark J. Hurlstone
University of Western Australia & Commonwealth Scientific and Industrial Research Organisation
A detailed analysis of the immediate serial recall (ISR) performance of a rhesus macaque (Macaca mulatta)—known as Jelly—revealed that it exhibits several benchmark effects that are characteristic of human ISR (Botvinick et al., 2009). These parallels raise the possibility that common mechanisms might be involved in the representation of serial order in short-term memory (STM) across species. Here I report simulations of two neurally inspired models of human ISR—viz. competitive queuing and gain-field models—that have each received direct support from electrophysiological recording data obtained with monkeys. Quantitative fits of the two models to Jelly’s data are reported and the implications of the results for the representation of serial order in STM across species considered.

**A-0977 Complex span tasks are continual distractor tasks (and vice versa)**
Ian Neath [1], Jean Saint-Aubin [2], Aimée M. Surprenant [1]
[1] Memorial University of Newfoundland; [2] Université de Moncton
Complex span and continual distractor tasks both alternate presentation of to-be-remembered items and distractor activity, yet no one invokes working memory to explain how people free recall a list of 16 items that has taken several minutes to present, and no one invokes long-term memory to explain recall of a short list that took a few seconds to present. In this talk, we compare performance in both tasks and demonstrate that the same explanatory principles apply to each. According to SIMPLE, the distractor activity in both tasks spreads the items out in time and successful recall is a function of whether a given item has more or fewer close neighbours.

**A-0978 Contiguity in Episodic Memory**
Michael J. Kahana
University of Pennsylvania
Considerable work has shown contiguity to be one of the major predictors of retrieval recall dynamics in human episodic memory. But there are many competing theories of how the memory system gives rise to contiguity, including the suggestion that contiguity is an artifact of task-specific strategies. To help adjudicate between these theories, we present analyses of both new and archival data to identify the range of tasks and conditions that exhibit contiguity and the extent to which these variables modulate the magnitude of the contiguity effect. We examine 15 factors such as participant age, individual differences, presentation rate, and the semantic associations among list items. Many of these reliably modulate contiguity but none eliminate it. Moreover, we show that contiguity is observed in many tasks including recognition, paired associates, and autobiographical recall. We discuss whether leading memory models can account for this pattern of results.

**A-0979 When dual task demands do not interact with cognitive load**
Robert H. Logie, Jason Doherty
University of Edinburgh
A key experiment reported by Baddeley and Hitch (1974) demonstrated that a preload of six items resulted in a trade off in performance with logical reasoning performed during a retention interval. Crucially, the impact on performance was the same regardless of the difficulty of the reasoning task. This finding that a main dual task cost did not vary with task difficulty was replicated and extended by Logie et al. (2004) and by Doherty and Logie (under review). The findings contrast with costs of overall dual-task cognitive load reported in subsequent studies. This paper will offer a potential explanation for the contrast.

**A-0981 Independent capacities but constrained output orders in the simultaneous free recall of auditory-verbal and visuo-spatial stimuli**
Cathleen Cortis, Geoff Ward, Kevin Dent
University of Essex
We examined capacity limits and output orders in immediate free recall of verbal and visuo-spatial stimuli in single- and dual-modality lists. In Experiment 1, participants were presented with lists of spoken words, visuo-spatial dots, or both words and dots presented with synchronised onsets for IFR. There was little reduction in the number of items recalled in the synchronised words and dots conditions, relative to the single-modality conditions, but the output orders were strongly constrained. These findings were replicated in Experiment 2, using lists of exclusively 6 words and/or dots for IFR. However, some trade-off in visuo-spatial capacity occurred when the words and dots stimuli were presented in alternation. This innovative data set constrains and extends current theories of immediate memory.

# Memory and Genetics

**S0043 session**

Thursday, 21 July 2016 | 09:30 - 11:30 | Room 6

**Chair/Organizer: Souchay Céline, Fabienne Collette**

**A-0425 Verbal short-term memory and lexical language abilities in Down syndrome: a task-driven association?**

Steve Marjerus

University of Liège, Belgium

Verbal short-term memory (STM) capacity has been considered to support lexical abilities in typical children and adults. This association has been questioned in Down syndrome (DS), a genetic condition due to a chromosome 21 trisomy. We explored in 47 adults with DS the association between receptive and productive lexical abilities, verbal STM abilities, and intellectual efficiency. We observed that verbal STM abilities were associated with receptive but not productive lexical abilities. Importantly, verbal STM abilities were still associated with receptive lexical abilities after controlling for variance explained by productive lexical abilities and intellectual efficiency. In adults with DS, verbal STM abilities appear to be predictive of specific task demands associated with vocabulary tasks rather than of vocabulary knowledge per se.

**A-0426 A framework to measure executive function in Down syndrome, with applications for dementia screening**

Liz Smith, Chris Jarrold

School of Experimental Psychology, University of Bristol, U.K.

Down syndrome (DS) is associated with a greatly increased risk of developing early onset Alzheimer's disease (AD). Executive function (EF) decline is the most consistent early sign of AD in those with DS. In adults with DS in comparison to typically developing (TD) children, we extract measures of three core components of EF using one simple framework. Specifically, we measure individuals' ability to deal with the memory updating, inhibitory, and temporal components of EF. We retested participants with DS 4 weeks after the first session. The validity of this measure will be presented. Preliminary analyses show high test-retest reliability in individuals with DS, indicating that this framework has potential with respect to the development of a fast baseline screening measure.

**A-0427 Prospective Memory in 22Q11.1 syndrome**

Nicola Ballhausen [1], Lydia Dubourg [2], Matthias Kliegel [1], Stephan Eliez [2]

[1] Departement of Psychology, University of Geneva, Switzerland; [2] Department of Psychiatry & Neuroscience Center, University of Geneva, Switzerland

22Q11.2 deletion syndrome, also known as velo-cardio-facial syndrome (VCFS) is a genetic disorder associated with a microdeletion in chromosome 22q11 and is characterized by pronounced impairments in visual attention and executive function. So far, no study investigated time-based prospective memory in 22Q11.2 children. Hence, we tested 21 22Q11 children and 21 matched controls using the Dresden Cruiser task. In this time-based prospective memory task, children had to remember to refuel a car at specific points in time while performing a driving simulation task. Results showed that children with 22Q11.2 fail to complete this task compared to the controls, thus showing prospective memory deficits.

**A-0428 Heterozygous deletion of the LRFN2 gene is associated with working memory deficits**

Céline Souchay [1], Julien Thevenon [2], Ina Dygai-Cochet [3], Laurence Faivre [2]

[1] Laboratoire de Psychologie et Neurocognition, University Grenoble-Alps, France; [2] Genetic center, Dijon, France; [3] Nuclear Medicine Department, Dijon, France

We report a unique family diagnosed with autosomal dominant learning disability and a 6p21 microdeletion segregating in three patients. The 870 kb microdeletion encompassed the brain-expressed gene LRFN2, which encodes for a synaptic cell adhesion molecule. Neuropsychological assessment identified selective working memory deficits, with borderline intellectual functioning. These data were consistent with brain MRI and FDG-PET functional brain imaging, which, when compared with controls, revealed abnormal brain volume and hypometabolism of gray matter structures implicated in working memory. We also performed electron microscopy immunogold labeling demonstrating the localization of LRFN2 at synapses of cerebellar and hippocampal rat neurons. Altogether, the combined approaches imply a role for LRFN2 in learning disability, specifically for working memory processes and executive function.

**A-0429 The influence of COMT on the neural substrates of short-term memory in normal aging**

Fabienne Collette, Marine Manard

Cyclotron Researh Centre, University of Liège, Belgium

Working memory dopaminergic modulation is generally expressed in healthy aging by an advantage for carriers of the Met allele at behavioral and brain activity levels. However, most tasks used did not allow to easily disentangle the contribution of maintenance and manipulation processes. We explored the effect of COMT genotype on the maintenance process using a Sternberg memory task varying the amount of information presented, in young and older homozygous carriers for the Val and Met alleles of the COMT gene. Although no clear behavioral difference was observed between groups, patterns of cerebral activity indicate difficulties for Met older individuals to maintain stable representations. These results will be discussed in terms of dopaminergic contribution to stability/flexibility of cognitive processes during aging.

**A-0430 Dopamine genes modulate episodic memory in old age**

Goran Papenberg

Aging Research Center, Karolinska Institutet and Stockholm University, Stockholm, Sweden

Heritability studies document substantial genetic influences on cognitive performance and decline in old age. Increasing evidence shows that effects of genetic variations on cognition, brain structure, and brain function become stronger as people age. Disproportionate impairments are typically observed for older individuals carrying disadvantageous genotypes of different candidate genes. I present data from several studies showing that effects of dopamine-relevant genes affect episodic memory stronger in older than younger adults, which is in line with dopamine's role in modulating long-term memory formation and consolidation. Moreover, these data support the resource-modulation hypothesis, which states that genetic effects are magnified in persons with constrained neural resources, such as older adults.

# Development of memory II

**I061 session**

Thursday, 21 July 2016 | 09:30 - 11:30 | Room 7

**Chair/Organizer: Tim Graf**

**A-0138 Testing a new approach to improve recall in different ages: Providing witnesses with a model statement**

Nathalie Brackmann [1,2], Henry Otgaar [1,3], Emma Roos af Hjelmsäter [2], Melanie Sauerland [1]

[1] Maastricht University, the Netherlands; [2] University of Gothenburg, Sweden; [3] City University London, UK

Obtaining an elaborate witness statement is essential for police investigations. Free recall, however, sometimes lacks richness of detail, especially in younger witnesses. Drawing from deception detection and educational psychological literature, we tested the beneficial value of a model statement to enhance recall quantity and accuracy in 48 adults (Experiment 1), and in 110 7-10-year-old children and 14-17-year-old adolescents (Experiment 2). Participants either listened to an unrelated account (i.e., model statement) or performed a filler task prior to recalling a target event witnessed one week earlier. We replicated age increases in statement quantity and age-related decreases to suggestive follow-up questions. No effect of model statement was found. Reasons for why a model statement was ineffective and recommendations are discussed.

**A-0203 Childhood Anxiety: The effect of interpretation on memory errors**

Lauren Bryce[1], Karen Salmon[2], David Harper[3]

Victoria University of Wellington

Anxiety is a prevalent mental health concern during childhood. Childhood anxiety is characterised by interpretation bias; a tendency to interpret ambiguous events in a negative manner. Interpretation bias is proposed to cause a negative memory bias in anxious individuals by introducing errors in recall of ambiguous events, yet there is limited research testing this idea. The current study adopted an experimental paradigm to investigate the potentially causal relationship between interpretation bias and memory bias. 81 children (8-11 years) heard ambiguous stories, followed by either a negative interpretation or a benign interpretation. Children were later asked to recall the stories. Manipulation of interpretation influenced the type of errors in story recall. Anxiety also independently predicted errors in recall.

**A-0215 Mechanisms of Word-learning in Typical and Atypical Development**

Stella Sakhon, Jamie Edgin

The University of Arizona, Tucson, United States

Individuals with Down syndrome (DS) have notable and well documented memory and learning difficulties and exhibit atypical hippocampal development. These difficulties have been shown to result in deficits in spatial cognition and episodic memory in DS. Recent work has suggested that memory impaired groups may be able to learn via extra-hippocampal associative learning mechanisms. Specifically, a learning procedure known as fast mapping (FM), has been found to support learning of novel arbitrary associations independent of the hippocampus. Therefore, this study examined word-learning based on hippocampal and hippocampal-independent ways of encoding and retaining words in individuals with DS using behavioral and eye tracking indices of learning. Preliminary results suggest poorer learning and retention under fast-mapping conditions in this memory impaired population.

**A-0253 Interaction of stress, attention, and lexicality in pupil old/new effects**

Tim Graf, Andreas Brocher

University of Cologne, Cologne, Germany

Pupil old/new effects measure recognition memory: Previously studied, old stimuli elicit larger pupils than previously unstudied, new stimuli. Experiment 1 replicated pupil old/new effects with legal words and pronounceable nonwords. In Experiment 2, we induced stress on participants by emphasizing on response speed and accuracy. Old/New effects were observed for words and nonwords. In Experiment 3, participants discriminated words from nonwords, rather than old from new stimuli, thereby shifting attention. Old/New effects were observed for words. Nonwords elicited larger pupils for new than old stimuli. When coupling word-nonword-discrimination with an emphasis on speed and accuracy (Experiment 4), new stimuli elicited larger pupils than old stimuli across conditions. Our data show a complex interaction of stress, attention, and long-term memory representations.

**A-0283 Altered video task in 15-month-olds: how to bridge the gap between Tulving's definition and current methods?**

Katarzyna Bobrowicz [1,2], Maciej Haman [2], Ryszard Bobrowicz [3]

[1] Lund University, Lund, Sweden; [2] University of Warsaw, Warsaw, Poland; [3] University of Copenhagen, Copenhagen, Denmark

We propose a new method of measuring episodic memory in subjects with highly restricted verbal abilities, 15 month-old children in this case. We refer to Tulving's definition of episodic memory, for it is currently predominant both in developmental and comparative approach. We introduce a method, which aims to pair a measure of episodic memory and a measure of self-awareness. Episodic recall is measured via presentation of an original and a modified (in terms of "who", "what" and "where") recording of a personal past event after a 24-hour delay. The participant is expected to watch the unfamiliar video significantly longer than the familiar video. Current success of the method may have implications for both above-mentioned research areas.

**A-0298 Memory and Development**

Nouman Nadeem

Islamabad Model College for Boys, Islamabad, Pakistan

Early childhood policies and practices are shaped by competing images and discourses of the young child. This paper reviews four core perspectives that have been most influential. Put very briefly: 1. A developmental perspective emphasizes regularities in young children's physical and psychosocial growth during early childhood, as well as their dependencies and vulnerabilities during this formative, phase of their lives; 2. A social and cultural perspective draws attention to respects in which early childhood is a constructed status and to the diversities of ways it is understood and practised, for, with and by young children, with implications for how goals, models and standards are defined, and by whom.

# Working memory and recognition III

**I083 session**

Thursday, 21 July 2016 | 09:30 - 11:30 | Room 8

**Chair/Organizer: Keisuke Fukuda**

**A-0709 Predicting and improving recognition memory using single-trial electrophysiology**

Keisuke Fukuda, Geoffrey F. Woodman
Vanderbilt University, Nashville, U.S.A.

Although we are capable of storing a virtually infinite amount of information in memory, our ability to encode new information is far from perfect. The quality of encoding varies from moment to moment and renders some memories more usable than others. Here we show that we can forecast the likelihood that a specific item will be later recognized by monitoring the fluctuations of the electroencephalogram (EEG) during encoding. Next we show that we can identify items that are poorly encoded using our electrophysiological measures, and successfully improve recognition memory by having subjects restudy the poorly encoded items. Our findings indicate that the separate electrophysiological measures index independent encoding subprocesses, and the feasibility of using electrophysiology as a real-time memory-encoding monitor.

**A-0758 Frequency-specific insight into short-term memory capacity**

Matteo Feurra [1,2], Giulia Galli [1,3], Enea Francesco Pavone [1,4], Alessandro Rossi [1], Simone Rossi [1]
[1] Department of Medicine, Surgery and Neuroscience, Unit of Neurology and Clinical Neurophysiology, Brain Investigation & NeuromodulationLab. (Si-BIN Lab), Azienda Ospedaliera Universitaria of Siena, Policlinico Le Scotte, Siena, Italy; [2] School of Psychology, Centre for Cognition and Decision Making, National Research University Higher School of Economics, Russian Federation; [3] Department of Psychology, Faculty of Arts and Social Sciences, Kingston University. Kingston Upon Thames, United Kingdom; [4] Department of Psychology, Sapienza University of Rome, Rome, Italy.

Here, we assessed whether transcranial Alternating Current Stimulation (tACS) increases the memory span for digits of young and midlife adults. Imperceptibly weak electrical currents in the alpha (10 Hz), beta (20 Hz), theta (5 Hz) and gamma (40 Hz) range, as well as a sham stimulation, were delivered over the left posterior parietal cortex, a cortical region thought to sustain maintenance processes in short-term memory through oscillatory brain activity in the beta range. We showed a frequency-specific effect of beta-tACS, that robustly increased the forward memory span of young, but not of middle-aged healthy individuals. The effect correlated with age: the younger the subjects, the greater the benefit arising from parietal beta stimulation.

**A-0785 Individual Differences in Resting Heart Rate Variability and Memory: Results of Two Studies Using the Think/No Think and the Deese-Roediger-McDermott Paradigms**

Julian F. Thayer [1], DeWayne P. Williams [1], Brandon Gillie [1], Nicole Feeling [1], Julian Koenig [2], Michael W. Vasey [1]
[1] The Ohio State University, Columbus, USA; [2] University of Heidelberg, Heidelberg, Germany

In the present paper we report the results of two studies that examined the relationship between resting vmHRV and memory. In the first study, we examined memory retrieval using the think-no think paradigm. On the IP test, we observed a significant effect of vmHRV ($\beta = -.37$, $p = .001$) such that participants with higher resting vmHRV had lower recall of the to-be-avoided stimuli relative to baseline. In a second experiment we used the Deese-Roediger-McDermott task. Results showed that those with higher vmHRV at baseline were better able to reject false memories ($\beta = -.354$, p

**A-0858 Discrimination Index derived from fixation duration as a measure of memory sensitivity**

Magali H. Sivakumaran [1], Andrew K. Mackenzie [2], James A. Ainge [1], Akira R. O'Connor [1]
[1] University of St Andrews, UK; [2] Nottingham Trent University, UK

Animal memory research makes frequent use of the Novel-Object-Recognition (NOR) paradigm, during which animals are simultaneously presented with one novel and one familiar object. The preferential exploration of novel compared to familiar objects can be quantified using the Discrimination Index (DI), a measure often considered to represent memory sensitivity. How does the DI correspond to equivalent measures used in human memory research? We conducted an eye-tracked Visual-Paired-Comparison task (analogous to NOR) in humans, with which we sought to identify the relationship between a fixation-based DI measure, and standard recognition response-based measures of sensitivity and bias. Our findings inform the degree to which memory measures used in translational research correspond to the parameters typically used to quantify episodic memory in humans.

**A-0900 ERP similarity across multiple encoding episodes and recognition**

Carolin Sievers, Louis Renoult
University of East Anglia, Norwich, UK

The present research employed the subsequent memory paradigm and representational similarity analysis (RSA) to investigate ERP similarity patterns across multiple encoding episodes and between encoding and recognition. Across two studies, we hypothesised that ERP amplitudes across repeated encoding would be more similar for subsequently remembered than forgotten trials, and that the N400 would show higher encoding pattern similarity than the LPC. The results consistently support these hypotheses. Moreover, while N400 amplitudes were more similar than LPC amplitudes across encoding episodes, LPC patterns were more similar than N400 between encoding and recognition. Overall, these findings suggest different roles for N400 (pattern similarity) and LPC (pattern distinctiveness) during memory encoding, as well as a role of LPC in contextual reinstatement during recognition.

**A-0902 No trade-off between memory specificity and memory generalization**

Dasa Zeithamova, Anthony Resnick, Maria-Alejandra De Araujo Sanchez, Caitlin R. Bowman
University of Oregon

Memory-based cognition requires both the ability to remember specific past events and the ability to link information across events, forming abstract knowledge generalizable to novel situations. Whether specificity and generalization depend on a single memory system (predicting co-occurrence) or competing memory systems (predicting trade-off) has been debated. We tested individual differences in memory specificity and generalization across three paradigms where they were independently measured: acquired equivalence, category learning, and paired associate learning with a hidden category structure. In all three tasks, individual differences in memory specificity and generalization were uncorrelated, except for a subset of participants using exemplar strategy during categorization, where they were positively correlated. These findings demonstrate no trade-off between specificity and generalization when supported by separate representations.

**A-0935 The domain-generality of working memory capacity: A matter of ability**

Kristof Kovacs [1], Dylan Molenaar [2], Andrew Conway [3]

[1] Eszterhazy Karoly College, Hungary [2] University of Amsterdam, The Netherlands [3] Claremont Graduate University, USA

The relative importance of domain-general and domain-specific sources of variance in working memory capacity (WMC) is a matter of debate. In intelligence research, the question of domain-generality is informed by differentiation: the phenomenon that across-domain correlations are inversely related to ability. We used the method of moderated factor analysis in two large data sets consisting of tests of memory span and reasoning. Our results are the first to demonstrate the existence of differentiation in WMC: as capacity increases, variance in WMC becomes more domain-specific. Fluid reasoning (Gf) also contributes to differentiation in WMC: when Gf is lower, WMC variance is more domain-general. Finally, differentiation only exists in tasks measuring working memory but not short-term memory.

# Poster session III

**P3 session**

Thursday, 21 July 2016 | 11:30 - 13:00 | Aula

**A-0930 Pseudowords primacy in free rcall**

Jackeline Neves Pereira, Silmara Batistela, Orlando Francisco Amodeo Bueno
Universidade Federal de São Paulo, São Paulo, Brazil

Is meaning necessary to recency effect? Twelve word-pseudoword pairs were presented 10 times to a group of subjects; to other group pseudowords were presented but not paired; another group had no previous access to pseudowords. To evaluate the primacy effect three pseudowords from the previous presentations were added to the beginning of 12 common word lists and the subjects had immediately to free recall the 15 stimuli. The three pseudowords not previously presented were not recalled: they didn´t support a recency effect. The pseudowords previously paired to common words gave rise to a recency effect, but, surprisingly, the non-paired pseudowords also gave rise to a recency effect of the same magnitude. Provisional interpretation involves the working memory episodic buffer

**A-0720 Memory facilitation for neutral faces encountered in goal-relevant contexts: An fMRI study**

Alison Montagrin [1,2,3], Virginie Sterpenich [2], Leonardo Ceravolo[3], Tobias Brosch[1,3], Didier Grandjean[1,3], Jorge Armony[4], Sophie Schwartz[2], David Sander[1,3]
[1]University of Geneva, Department of Psychology, Switzerland [2]University of Geneva, Department of Basic Neurosciences, Switzerland [3]University of Geneva, Swiss Center for Affective Sciences, Switzerland[4]Douglas Institute, Montreal, Canada

Emotional situations are better remembered than neutral ones, but the psychological conditions and brain mechanisms underlying this effect are still debated. While valence and arousal have been thoroughly investigated, few studies have directly tested whether, and under which conditions, goal-relevant stimuli are better remembered than goal-irrelevant stimuli. In this study, we examined encoding and recognition of neutral faces presented in goal-relevant or goal-irrelevant daily life contexts. Results showed that identities encountered in goal-relevant contexts were better remembered than those encountered in goal-irrelevant ones. Brain activation associated with learning systems and social values were found for goal-relevant contexts. This study confirms that goal-relevance can affect memory for neutral face identities, possibly to adequately respond to these individuals in future social contexts.

**A-0722 Pupil constriction as an indicator of novelty encoding – Revisiting the von Restorff effect**

Marina P Gross [1,2], Nash Unsworth [2]
[1] Washington University in St. Louis, St. Louis, MO, U.S.A; [2] University of Oregon Eugene, OR, U.S.A

We recorded pupillary responses during encoding of distinct events in a free recall task. Participants learned semantically related lists that included a distinct item. We examined whether encoding of the distinct item would be associated with pupil dilation as linked to increased attention and norepinephrine levels or would be associated with pupil constriction as related to novelty processing and increased acetylcholine. Results indicate that distinct items were recalled better than control items, and that they are associated with pupil constriction rather than dilation. This suggests enhanced memory for distinct items is not due to increased levels of attention to them, but is due to novelty detection, which is possibly linked to the influence of acetylcholine in the hippocampus.

**A-0725 I recall the Firedog: Paradoxically enhanced memory for new compound words among individuals with memory decline**

Talya Sadeh, Asaf Gilboa, Sigal Gat-Lazer, Christa Dang, Morris Moscovitch
Rotman Research Institute Baycrest Centre Toronto, ON, Canada

Traditionally, recall was assumed to rely exclusively on recollection, which depends on relational representations. Recent research, however, shows that recall may also rely on familiarity, which can depend on unitized representations. Memory decline associated with aging and MTL-lesions is characterized by impaired relational memory. Here we used a novel paradigm probing recall for new unitized compound words (e.g., study: “FIREDOG”; test: FIRE--?), which exploits non-relational mnemonic strategies. Compared to highly-functioning older-adults, lower-functioning older-adults were impaired in relational, paired-associates recall (e.g., study: “PUMP-HUT”; test: PUMP--?), but not in compound recall. Patients with MTL-lesions performed substantially better on the compound task than on the paired-associates task. Our results show that boosting non-relational aspects of recall enhances performance among these populations.

**A-0728 Using MEG to identify the neural correlates of recollection- and familiarity-based recognition in a source memory task.**

Nai-Feng Chen[1], Chun-Hsien Hsu[2], Shih-kuen Cheng[1]
[1] Institute of Cognitive Neuroscience, National Central University, Taiwan; [2] Institute of Linguistics, Academia Sinica, Taiwan

Dual-process theories suggested that recognition memory is supported by two qualitatively different processes: recollection and familiarity. The current MEG study aim to investigate the neural substrates of recognition memory by using the modified remember/know combined with confidence rating procedure. At retrieval stage, participants give an old/new confidence rating response followed by a recollection/non-recollection judgement. The MEG source localization data reveals distinct temporal and spatial scalp distributions of two processes, where familiarity related activity is observed in the left superior parietal lobe in the early time window; and recollection related activity is found in the temporoparietal regions in the late time window. The results suggest that recollection and familiarity make dissociable contributions to recognition memory.

**A-0729 Autobiographical reasoning and emotional aspects of autobiographical memory**

Yuji Itoh, Eri Takenaka
Keio University, Tokyo, Japan

Autobiographical reasoning (AR) is the reflective activity in which autobiographical memories (AM) are interpreted, evaluated, and connected to one's present and future. We examined the relation between the valence of the AMs and the functions of the ARs. Participants were asked to describe positive and negative AMs that caused ARs, and then, for each AM, to answer to the questionnaire on the content of the AR and characteristics of the AM. Results showed that positive AMs caused more ARs on ones' growth, understanding of selves, and points of changes in ones' lives than negative AMs. Differences between this study and some previous studies that showed negative AMs elicited more ARs are discussed.

**A-0732 An ERP Study of the Retrieval Orientation of Neutral Pictures Embedded in Emotional Contexts**

Shih-kuen Cheng, Sze-Ti Lin
Institute of Cognitive Neuroscience, National Central University, Taiwan
Retrieval orientation refers to the cognitive operations that bias the processing of retrieval cues for a specific retrieval target. This study examined whether different retrieval orientations are adopted for neutral items encoded in neutral and emotional contexts. In three study-test cycles, participants were first presented with pictures of neutral objects embedded in emotionally neutral, negatively valenced, and positive valenced background scenes, respectively. They then made old/new judgments to the objects without the background scenes. The ERPs associated with the correct rejections were examined. We found two sets of retrieval orientation effects, one related to arousal and the other related to valence over the frontal scalp region. These retrieval orientation effects reveal the modulation of emotional context on the subsequent retrieval.

**A-0733 The effects of self-choice and duration on true and false recognition in the DRM paradigm**
Yayoi Kawasaki [1],Yukio Itsukushima [2], Hiroshi Yama [3]
[1] Japan Society for the Promotion of Science/ Senshu University, Kanagawa, Japan [2] Nihon University, Tokyo, Japan [3] Osaka City University, Osaka, Japan
We investigated the effects of self-choice and duration on true memory and false memory with the DRM paradigm. After learning lists in the self-choice and forced-choice condition, 44 participants answered the recognition test immediately or one week later. As a result, list items were recognized more in the self-choice condition than in the forced-choice condition. And chosen list items were recognized more than unchosen items. There is no effect of the one week duration. Critical lures were falsely recognized less in forced-unchosen condition than others in the immediate test. And same tendency were observed in the delayed one, too. Hence the list items even unchosen in the self-choice condition were processed deeply enough to create false memory.

**A-0734 Are you motivated to remember? The impact of pro-social and self-interested motivation on prospective memory**
Jill Talley Shelton, Spencer Hulse, Nicholas Comotto, Jessica Hacker, Michael Carroll
University of Tennessee at Chattanooga, Chattanooga, TN, USA
Pro-social motivation is defined as the desire to protect and promote the well-being of others as opposed to self-interested motivation, which is the motivation to promote the well-being of only oneself (Grant, & Berg, 2012). The purpose of this study was to investigate how such motivational factors impacted prospective memory (i.e., remembering to perform future intentions). Seventy-seven participants were randomly assigned to one of three conditions: pro-social incentive, self-interested incentive, or no incentive. All participants completed both a laboratory and naturalistic prospective memory task. We observed significantly higher performance in the self-interested condition relative to the pro-social and no incentive conditions across both prospective memory tasks. No differences were observed between the pro-social and no incentive conditions.

**A-0736 The mnemonic consequences of co-witnesses selectively recalling details of a crime scene**
Riddhi H. Mehta, Betsy E. Galicia, Rima Malkan, Charles B. Stone
CUNY John Jay College of Criminal Justice, New York, USA
Eyewitness testimony is an essential component of the American criminal justice system. Despite its importance, eyewitness memory has been known to be unreliable and malleable. Consequently, it is critical to understand the various mechanisms driving these inaccuracies. One such mechanism is the selective retrieval by a witness to a co-witness about crime scenes. To examine this, the present research extended the socially shared retrieval-induced forgetting (Cuc, Koppel & Hirst, 2007) paradigm to instances in which a listener overhears a speaker selectively retrieve details of one of the two suspects who committed a robbery. The results of this research are discussed in terms of the importance of selective retrieval and intentionality in shaping how co-witnesses remember the details of a crime.

**A-0746 How does updating work in the N-back task?**
Azumi Tanabe-Ishibashi [1], Ryo Ishibashi [2], Satoru Saito [3]
[1] Otemon Gakuin University, Japan; [2] The University of Manchester, UK; [3] Kyoto University, Japan
The N-back task is known as an updating task, yet it is unclear how updating is achieved in this task. Oberaurer and colleagues have proposed that the removal of old information, a subprocess of updating, requires 500-600ms to complete. This process may fail if the intervals between item presentation are not sufficiently long. We investigated this issue by manipulating the length of the interval between items within the N-back task, and further examined whether updating during the task is an active operation of memorized content or a passive overwriting by sensory input. The experiment showed that shorter intervals resulted in poorer performance, but sensory overwriting by input at the same position did not facilitate updating.

**A-0748 The effects of the BDNF Val66Met polymorphism on autobiographical memory**
Géza Gergely Ambrus [1], Jessica Komes [1], Gyula Kovács [1,2], Stefan Schweinberger [1], Ingo Kurth [3], Wiebke Struckmann [1]
[1] Institute of Psychology, Friedrich Schiller University Jena;[2] Department of Cognitive Science, Budapest University of Technology and Economics;[3] Institute of Human Genetics, Friedrich Schiller University Jena
The effects of the BDNF Val66Met polymorphism on different memory systems have been extensively investigated. While episodic memory has been found to be influenced by the presence of a Met allele, other memory systems, such as working memory and procedural memory, seem to be largely unaffected. Here, we tested if Val homozygotes and Met carriers show differences in familiarity, recollection, and monitoring-related ERPs in a task where they were instructed to judge if a photo presented was (1) taken earlier by themselves, (2) not taken by the themselves, but depicted a familiar scene, or (3) was not at all familiar. The results of this study may reveal an altered neural processing of autobiographical stimuli for carriers of the Met allele.

**A-0749 Task switching hurts memory encoding**
Michèle Friedli, Beat Meier
Institute of Psychology and Center for Cognition, Learning, and Memory, University of Bern, Switzerland
Goal-directed behavior requires both stability and flexibility. In the present study, we investigated the impact of these cognitive control demands on subsequent memory performance with a task switching paradigm. In experiment 1 we used univalent stimuli, in experiment 2 we used bivalent stimuli. In both experiments, recognition memory for switch and repetition stimuli was tested subsequently. During encoding, task switching produced switch costs in both experiments. Critically, subsequent memory was consistently lower for switch compared to repetition stimuli. Thus, flexibility during task switching seemed to hurt the encoding of stimulus-specific information. Consequently, the enhanced demands of task switching are associated with an increased encoding time but lower subsequent memory performance.

**A-0750 Neural correlates of mental context reinstatement supporting episodic memory retrieval**

Inês Bramão, Anna Karlsson, Mikael Johansson
Department of Psychology, Lund University, Sweden

This study investigated if mental reinstatement of an encoding context during retrieval increases memory accessibility. Participants performed a cued-recall memory task where the overlap between encoding and retrieval context and the nature of context reinstatement (mental versus physical) were manipulated. Memory performance improved when the encoding-retrieval context overlapped in a comparable way for mental and physical context reinstatement. However, compared to physical reinstatement, mental reinstatement was characterized by later and more sustained ERP effects. Together, our results suggest that the access to episodic memories can be facilitated also by mentally reinstating the encoding context, and furthermore that such benefits may be supported by processes differently engaged than when the encoding context is physically re-presented at the time of retrieval.

**A-0751 The effect of pre- and post-study choices on learning paired associates.**

Andreas Jemstedt, Veit Kubik, Fredrik Jönsson
Stockholm University

We investigated how study-time allocation either pre- or post-study affected the learning of word pairs (i.e., final memory performance). Pre-study choices were always made on both the cue and target word, while post-study choices were also made when only the cue word was visible. In addition, the latter three conditions were compared to random study-time allocation. Post-study choices led to better learning than pre-study choices, but only when the post-study choices were made solely on the cue word. Overall, participants learned more following self-regulated study-time allocation, as compared to random allocation.

**A-0752 Does ego depletion increase the perceived familiarity of novel objects?**

Katsuya Tandoh
Aichi Shukutoku University, Japan

The purpose of this study is to examine whether ego depletion increases spatial misattribution of familiarity or not. Thirty undergraduate students were randomly assigned to either a depletion (high self-control task) or control (low self-control task) condition. Following the ego depletion manipulation, all participants completed familiarity judgments of abstract symbols which were presented alone or with another non-target symbol. The flanker symbol was either very familiar or very unfamiliar. In ego depletion condition, familiar flankers increased rated target familiarity, relative to the no-flanker control (p

**A-0753 State-related oscillatory brain activity associated with successful memory encoding**

Danying Wang, Christina S Konen, Wanyi Liu, Leun J Otten
University College London (UCL), UK

We investigated whether memory encoding relies on sustained oscillatory brain activity associated with state-related cognitive processes. Electrical brain activity was recorded from twenty participants while they made animacy or phonological judgments on four-word task blocks each lasting 15 s. Memory for the words was then probed with a recognition test. Time-frequency analyses showed that sustained increases in frontocentral theta power across the initial 6 s of a block predicted how many words were later remembered from the block, but only when words were encoded deeply. In contrast, decreases in transient alpha power after word onset predicted subsequent memory of the item, regardless of levels of processing. The findings suggest distinct contributions of state-related and item-related processes to successful encoding.

**A-0754 Reduced positive imagery and elevated negative verbal spontaneous thinking in dysphoric relative to non-dysphoric individuals**

Julie L Ji [1], Fionnuala C. Murphy [1], Colin MacLeod [2,3], Emily A. Holmes [1,4]
[1] Medical Research Council Cognition & Brain Sciences Unit, Cambridge, UK, [2] University of Western Australia, Australia, [3] Babeș-Bolyai University, Romania; [4] Karolinska Institutet, Sweden

Mental imagery has the capacity to simulate the perceptual, physiological and emotional correlates of real life experience, and have been implicated in emotional disorders such as depression. However, experimental evidence on the frequency of imagery versus verbal emotional thinking is lacking. Two studies investigated the frequency of spontaneously occurring thoughts in dysphoric and non-dysphoric individuals during an attentional vigilance task. Thought frequency as a function of Mode (imagery vs. verbal), Valence (negative, positive, neutral) and Temporal orientation were assessed. We hypothesised a negative mood-congruent effect involving higher relative frequency of negative versus positive imagery and verbal thoughts in dysphoric compared to the non-dysphoric group. Results supported our hypothesis. Implications for the relationship between mood and spontaneous thought patterns are discussed.

**A-0755 Implicit sequence learning in patients with major depressive episode**

Karolina Janacsek [1,2], Emoke Borbély-Ipkovich [3], Xénia Gonda [4], Dezso Nemeth [1,2]
[1] Institute of Psychology, Eötvös Loránd University, Budapest, Hungary [2] MTA-ELTE NAP B Brain, Memory and Language Research Group, Institute of Cognitive Neuroscience and Psychology, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary [3] Institute of Psychology, University of Szeged, Szeged, Hungary [4] Department of Clinical and Theoretical Mental Health, Semmelweis University, Budapest, Hungary

Major depressive episode (MDE) is one of the most common psychiatric diagnoses. While the relationship between explicit/conscious memory and mood are relatively well-explored, the effect of mood and affective disorders on implicit/nonconscious learning has received less attention. Here we examined implicit sequence learning and its consolidation in 22 patients with MDE (12 diagnosed with major depressive disorder, MDD, and 10 with bipolar disorder, BD) and 20 controls. Interestingly, patients with MDD showed weaker performance in the learning phase, while patients with BD exhibited weaker consolidation of the acquired knowledge after a 24-hour delay. These findings support previous research of fronto-striatal dysfunction in depression, and highlight partly different cognitive profiles in the subgroups.

**A-0757 Age effects on distraction-induced recognition biases**

John A Allen, Zara Bergstrom
University of Kent, Canterbury, United Kingdom.

Intentional recognition memory can be biased by unintentional recognition of distracting stimuli in the same environment, and such biases are enhanced in older age. We used EEG to investigate how the neurocognitive processes underlying distractor-induced recognition biases vary across ages. Adults aged either under 25 or over 60 were tested. Participants initially studied words and pictures, and were later given a recognition test

where they judged whether words were previously seen ("old") or not seen ("new") whilst ignoring old and new pictures in the background. EEG results showed that biases due to unintentional picture recognition involved a rapid automatic memory process, and further analyses explored if this effect was modulated by age.

**A-0759 Aging and attentional refreshing impairment in working memory**

Gabriel Jarjat [1], Sophie Portrat [2], Pascal Hot [1]
[1] Université Savoie Mont-Blanc, Laboratoire de Psychologie et Neurocognition, UMR 5105 – CNRS, 73011 Chambéry, France ; [2] Université Grenoble Alpes, Laboratoire de Psychologie et Neurocognition, UMR 5105 – CNRS, 38040 Grenoble, France.

The aim of the present study was to investigate the hypothesis that age-related decline in working memory can be attributed, at least partially, to attentional refreshing impairment. For this purpose, younger and older adults performed a computer-paced complex span task in which they had to maintain letters while processing digits under articulatory suppression. Results showed that, even when memory load and processing speed are adapted to individual capacity, the manipulation of the cognitive load of the processing task (through the nature and the pace of the task) had a differential effect across ages. These results suggest that beyond the general cognitive slowing associated with age, a specific impairment in attentional refreshing can account for age-related decline in working memory.

**A-0761 Memory consolidation through retrieval: Semanticization of memory representations**

Catarina S. Ferreira, Maria Wimber
University of Birmingham, UK

Retrieval can act as a powerful memory enhancer, but the neurocognitive mechanisms underlying this enhancement are still unknown. Using pattern fMRI, we here tested the possibility that retrieval solidifies memories through “online” reactivation mechanisms similar to those involved in offline memory consolidation. Participants encoded scene-object pairs, with objects belonging to different semantic categories. They then either retrieved or restudied the objects over two sessions, 48 hours apart. Using Representational Similarity Analysis, we traced the dynamic changes in item-specific and categorical activation patterns representing each memory in visual cortex. Results show that across sessions, retrieved (as opposed to restudied) objects become, neurally, less individualised, and more semanticised, supporting the hypothesis that retrieval acts as a fast route to memory consolidation.

**A-0762 Testing effect with visual material depends on the verbalization of the material**

Catarina S. Ferreira, Maria Wimber
University of Birmingham, UK

Rehearsing recently acquired memories via active retrieval, as opposed to restudy, boosts their long-term retention. The vast majority of studies demonstrating such “testing effects” used verbal materials, leaving open whether purely visual memories equally benefit from retrieval. Three behavioural experiments were conducted to address this question, varying the degree to which semantic meaning could be assigned to the practised memories. Results from the first two experiments showed no (or reversed) testing effects when using abstract shapes and when semantic meaning was task-irrelevant. Testing did enhance memory, however, in a third experiment using nameable objects. Thus, purely visual memories seem to not benefit from retrieval, and some degree of verbalization is necessary in order for the testing effect to occur.

**A-0764 Does manipulating age in earliest memories affect narratives more than snapshots?**

Ineke Wessel, Akke-Marij D. Ariesen, Jildou J. Stapert, Vanessa Tapken
University of Groningen, The Netherlands

We followed up on earlier findings that priming participants with a particular age (e.g., 2 vs 6 years) renders different age estimates for earliest memories and that these estimates may vary across memory type. Specifically, narrative memories might be more sensitive to age manipulations than snapshots. In our previous studies, independent raters categorized memory type. The present study aimed at establishing the differential effect of manipulating age in earliest memory when participants deliberately retrieve either snapshots or narratives. Thus, we employed a 2 (instruction: 6-8 years old vs age-neutral) x 2 (memory type: snapshot vs narrative) between-participants design. At the time of writing the present abstract, data from more than 400 participants were collected. Preliminary results will be presented.

**A-0766 Multisensory integration: beneficial effect of a motor exploration in kindergarten children**

Arthur Boisson [1,2], Hélène Labat [3], Annie Magnan [1,2,4], Rémy Versace [1]
[1] Laboratoire d'Étude des Mécanismes Cognitifs, Université Lumière Lyon 2, 5 avenue Pierre Mendès-France 69676 Bron Cedex, France; [2] LabEx Cortex ANR-11-LABX-0042; [3] Laboratoire Paragraphe, Université de Cergy-Pontoise, Institut d’éducation, Site de Gennevilliers, Avenue Marcel Paul, 92230 Gennevilliers, France; [4] Institut Universitaire de France.

The aim of the present study was threefold. First, we aimed at replicating the beneficial effect of a motor exploration in a multisensory training of grapheme-phoneme correspondences with 5-years old children. Second, through the Act-In Model framework (Versace et al., 2014), we investigated in detail the underlying mechanisms responsible for this effect. Third, we aimed at providing an original multisensory training (i.e., visual-auditory-motor) targeting the knowledge of grapheme-phoneme correspondences. In order to meet these objectives, 36 kindergarten children have undergone training (VA, Visuo-Auditory or VAM, Visuo-Auditory-Motor) targeting the knowledge of grapheme-phoneme correspondences. The results showed a superiority of VAM training suggesting a beneficial effect of motor exploration. These results are discussed in light of the Act-In model.

**A-0767 Investigating the functional interaction between episodic and semantic memory: Is the semantic advantage contingent on awareness of a relationship at encoding?**

Joanne L. Park, David I. Donaldson
University of Stirling

Despite being experimentally dissociable, episodic and semantic memory typically work together. In particular, episodic memory is enhanced when information is semantically meaningful. What is not clear is whether this effect is constrained by awareness of relationships between to-be-remembered stimuli. To investigate, we manipulated the semantic content of information (related vs. unrelated word pairs) during an associative recognition task. Results revealed that memory was enhanced for semantically related pairs, as predicted. Critically, however, this effect was influenced by participants' subjective awareness of a relationship. Our findings support the claim that episodic and semantic memory interact functionally, but demonstrate that this interaction is independent of the putative semantic content of to-be-remembered stimuli, depending instead on awareness that semantic meaning is present.

**A-0770 Delayed effects of reward conditioning on subsequent associative memory.**

Ewa A. Miendlarzewska [1,2,3], Kristoffer Aberg [1,3], Daphne Bavelier [2,4,5], Sophie Schwartz [1,2,3]
[1] Department of Neuroscience, University of Geneva, Geneva, Switzerland [2] Swiss Center for Affective Sciences, University of Geneva, Geneva, Switzerland [3] Geneva Neuroscience Center, University of Geneva, Geneva, Switzerland [4] Psychology Section, FPSE, University of Geneva, Geneva, Switzerland [5] Brain & Cognitive Sciences, University of Rochester

The effect of reward conditioning on subsequent associative learning was assessed in an fMRI experiment. On the first day, 36 unique pictures from two semantic categories were first reward conditioned (with high- and low-reward assigned to either semantic category). To this set, 36 new pictures from the same respective semantic categories were added and then used as stimuli in a picture-location learning task. 24h after learning, we found poorer location recall for pictures from the high-reward semantic category accompanied by activation in the dopaminergic midbrain. However, reward had an opposite effect, accompanied by activation in the striatum, on source memory recall. Thus, we demonstrate dichotomous effects of reward on later memory recall that generalized to semantically similar non-conditioned stimuli.

**A-0772 Thought substitution can reduce suppression-induced forgetting**

Javier García-Pacios [1], Roland G. Benoit [2], Michael C. Anderson [3]
[1] Department of Psychology. Faculty of Health Sciences. Camilo José Cela University, and Laboratory of Cognitive and Computational Neuroscience. Center for Biomedical Technology (UPM-UCM), Madrid, Spain; [2] Harvard University, Department of Psychology and Center for Brain Science, Cambridge, MA, USA; [3] MRC Cognition and Brain Sciences Unit, Cambridge, UK

Sometimes people try to prevent the retrieval of unwanted memories by distracting themselves with substitute thoughts. Previous work has suggested that thought substitution might be an effective way of forgetting memories. The current experiments examined whether thought substitution may decrease suppression-induced forgetting (SIF), in part because of relatedness of substitutes to the original memory. In two experiments, we examined how semantic associations between to-be-suppressed targets and thought substitutes affected SIF. Experiment 1 asked people to generate their own distracting thoughts and examined whether SIF was predicted by pre-existing associations of substitutes to targets. Experiment 2 manipulated the relatedness of experimenter-provided substitutes. Both experiments show that semantic target-substitute relatedness not only modulates SIF, but also modifies the inhibitory features of forgetting

**A-0773 Pupil dilation reflects interference during memory retrieval**

Amanda Bjernestedt [1], Roger Johansson [1], Philip Pärnamets [1,2], Mikael Johansson [1]
[1] Lund University, Lund, Sweden; [2] Karolinska Institutet, Stockholm, Sweden

We demonstrate that pupillometry can be used to track memory interference independent of explicit responses. Pupil diameter was recorded throughout encoding and retrieval of words from the same category over 4 trials, causing buildup of proactive interference (PI). In a contrasting condition, the category was switched on the 4th trial, causing release from interference (RI). Pupil dilation systematically increased for both conditions as interference built up and retrieval performance declined. Critically, in trial 4 the RI condition resulted in improved retrieval performance, with significantly smaller pupil dilation than in the PI condition, where performance continued to decline. Principal component analysis revealed an early dilation peak possibly related to control of interference, and a later component possibly linked to memory search.

**A-0774 Fusion of distinct spatial representations in hippocampus**

Stepan Kapl, Stephanie Lissette Proskauer-Pena, Frantisek Zitricky, Karel Jezek
Biomedical Center, Faculty of Medicine in Pilsen, Charles University in Prague, Czech Republic

Mental representations behave as attractor states whose nonlinear dynamics allows maintenance of non-confounding memories even for items with similar contents. Using multi-unit recording from rat hippocampus, we investigated development of two uncorrelated spatial representations. Rats were trained to encode two distinct environments with identical geometry but different lighting- an arrangement allowing their step-like switch (‘teleportation’) previously shown to induce a rapid reactivation of the respective representation (Jezek et al.,2011). Here we show that repetitive teleportation procedure led to relative convergence of originally distinct spatial maps (CA1:r=0,09±0,17 to r=0,50±0,29 (p

**A-0778 False memories induced through dynamic video sequences enhance problem-solving behaviour**

Zacharia Nahouli, Ieva Biliunaite, Giuliana Mazzoni
University of Hull, UK

False memories were previously shown to act as successful primes to insight-based problem solving tasks. Such research typically incorporates Deese/Roediger-McDermott (DRM) word lists to induce false memories. The present study aimed to replicate this finding using false memories induced from dynamic video sequences. Participants studied videos with differing emotional contexts (neutral, positive, negative) and then had to recognise certain studied items and false memory critical lures. These items acted as primes to some compound remote association task (CRAT) problems. CRAT problems primed by false memories had a significantly higher solution rate than true memory and unprimed problems, which did not differ significantly. Emotional context did not affect solution rates. These findings support a false memory enhancement effect for problem solving.

**A-0780 Testing attention-based accounts of priming effects on subsequent memory**

Alexander J. Kaula, Andrea Greve, Richard Henson
MRC Cognition & Brain Sciences Unit, Cambridge, United Kingdom

Improved contextual memory for primed items (e.g. Gagnepain, 2011) demonstrates an interesting interaction between implicit and explicit memory. Three experiments tested whether this effect of “priming on subsequent memory” (PSM) reflects attentional resources. Novel and primed faces (items) were paired with scenes (contexts) during a face categorisation task, and recall for their pairings later tested. Experiment 1 matched encoding time and demonstrated that PSM does not simply reflect increased time for contextual association. Experiment 2 degraded the faces and demonstrated that PSM does not reflect reduced perceptual load. Experiment 3 imposed a dual-task and the results suggest that PSM appears to reflect reduced central load, though an additional role for prediction error cannot be ruled out.

**A-0781 Retrieval-induce-forgetting in adults with inattention.**

Masako Yamashita[1], Katsuya Tandoh[2], Kazunori Hanyu[3], Kazue Igarashi[4]
[1] Tokyo Ariake University of Medical and Health Sciences, Japan; [2]Aichi Shukutoku University, Japan;[3] Nihon University, Japan;[4] Shirayuri Collage,Japan;

The RIF paradigm assumes that participants are induced to forget items that are in practiced categories but not practiced in task. However, in practice some participants show high score of Rp- items than score of items (Nrp) that are not in practiced categories. Seventeen adults participated in a standard procedure of retrieval-induced forgetting. They were assigned to two groups, standard (minus) Rp- group (n=6) and

activated (plus) Rp- group (n=6). Self-reports of "inattention" (according to ADHD diagnostic criteria on DSM-IV-TR) and Digit Span (by WAIS III) were conducted. Results showed the degree of inattention reported by activated Rp- group was greater than that reported by standard Rp- group.

**A-0783 Cortisol Suppression During Sleep Enhances Memory Re-consolidation in Humans**

Antypa Despina [1,2,3], Rimmele Ulrike [1]
[1] Laboratory of Behavioral Neurology & Imaging of Cognition, Department of Neurosciences, University of Geneva, Switzerland [2] Lemanic Neuroscience Doctoral School, Switzerland [3] Swiss Center of Affective Sciences, Switzerland

Recent evidence shows that human episodic memory can undergo changes after reactivation through a process called reconsolidation (for review: Schiller & Phelps, 2011; Nadel et al., 2012; Agren, 2014; Forcato et al., 2014). Alterations of glucocorticoid levels may be one way of manipulating reconsolidation processes (Coccoz et al., 2011, 2013; Akirav and Maroun, 2012; Dongaonkar et al., 2013; Drexler et al., 2015). Previous human studies point towards the possibility that the cortisol synthesis inhibitor metyrapone may alter not only retrieval, but possibly also reconsolidation processes (Rimmele et al. 2010, 2015; Marin et al. 2011). Here, in a double-blind, within-subject design, we study the effects of cortisol synthesis inhibitor metyrapone on reconsolidation processes during sleep, as tested by later memory performance.

**A-0790 Withdrawal of Spatial Attention Following Intentional Forgetting**

Yuh-shiow Lee
National Chung-Cheng University, Chiayi, Taiwan, R. O. C.

This study investigated how intentional forgetting influenced spatial attention. Two experiments measured eye movements to examine whether intentional forgetting involved an overt attention shift. The results revealed that intentional forgetting involved an overt attention shift away from the to-be-forgotten and to-be-ignored information. Regardless of whether the study word was presented visually or auditorily, mental effort, as indexed by the pupil size, increased following remember, as compared with forget and ignore cues. These findings are discussed in terms of controlling overt spatial attention during encoding to withdraw attention from irrelevant information and to allocate cognitive resources to relevant information for long-term retention.

**A-0791 Retrieval practice and foreign-language vocabulary learning**

Yohei Yamada
Nara University of Education, Nara, Japan

Retrieval practice of previously studied items can produce better long-term retention than restudying the same items. However, retrieving a subset of learned items also impairs recall of related items from the study phase. The current study examined a boundary condition that people efficiently develop their vocabulary in a foreign language. Specially, I focused a semantic similarity between retrieved words and non-retrieved words. Participants studied Japanese-English word pairs and then retrieved some of the studied pairs. Finally, a cued-recall test of all the studied pairs was conducted. For high similarity condition, retrieval-induced facilitation was observed. On the other hands, retrieval-induced forgetting was observed for middle similarity condition. This finding suggests a boundary condition that people develop richer foreign language vocabularies.

**A-0793 Tracking Memory Intrusions with Event-Related Potentials**

Robin Hellerstedt [1], Mikael Johansson [1], Michael C. Anderson [2]
[1] Lund University, Sweden; University of Cambridge, UK

Involuntary retrieval of unwanted memories is common in several clinical disorders including post-traumatic stress disorder. With an aim to investigate the neurocognitive mechanisms underlying such memory intrusions, we recorded event-related potentials (ERPs) while participants tried to avoid retrieval of a well-learned associate upon presentation of a retrieval cue (i.e. attempted to suppress retrieval). The participants rated the extent to which they thought of the associate after each trial and these ratings were used to contrast intrusion and non-intrusion trials. The ERP results revealed that memory intrusions gave rise to a negative slow wave that may reflect the presence of the intruding memory in working memory. Furthermore, memory intrusions were associated with a reduced left parietal positivity, possibly indicating avoided recollection.

**A-0794 Dealing with errors during retrieval practice: effects of feedback with and without hints**

Gesa van den Broek [1], Eliane Segers [1], Hedderik van Rijn [2], Atsuko Takashima [1], Ludo Verhoeven [1]
[1] Radboud University Nijmegen, The Netherlands [2] University of Groningen, The Netherlands

Retrieval is most beneficial for learning when it is successful or combined with feedback. We compared different types of feedback to see if responding to errors with a hint that creates a new retrieval opportunity leads to better retention than directly showing the correct answer. High school students (n=203) practiced foreign vocabulary with a spaced retrieval program with correct-answer feedback, orthographic hints, or semantic hints with keyword mnemonics. Across three experiments, benefits of hints compared to correct-answer feedback were limited to performance tests with the same hints, whereas other measures showed no or negative effects of hints. These results suggest a delicate trade-off between spending time processing feedback or going through further repetitions when time on task is limited.

**A-0800 Unconscious Memory Formation**

Else Schneider, Katharina Henke
University of Bern, Switzerland

Episodic memory allows for remembering what happened when and where and is widely believed to depend on consciousness. Questioning this conscious-centred view, we investigated whether humans were able to unconsciously encode and retrieve episodes in time and space. We presented 36 distinct film clips subliminally to 48 participants. After every third clip, participants underwent a forced-choice memory task, targeting temporal and spatial aspects of the three preceding clips. Although accuracy was at chance level, correct choices were given significantly faster than incorrect choices. Participants' viewing behaviour also evidenced unconscious encoding of action sequences. We interpret these effects as suggestive of the unconscious encoding and retrieval of the complex storylines and thus suggestive of an unconscious form of episodic memory.

**A-0808 Learning set size influences retrieval effort – evidence revealed by pupillometry**

Péter Pajkossy [1,2], Attila Keresztes [3], Mihály Racsmány [1,2]
[1] Research Group on Frontostriatal Disorders, Hungarian Academy of Sciences, Budapest, Hungary; [2] Department of Cognitive Science, Budapest University of Technology and Economics, Budapest, Hungary; [3] Center for Lifespan Psychology, Max Planck Institute for Human Development, Berlin, Germany

Online investigations of retrieval effort are scarce. Thus we used pupillometry, as an online measure of cognitive effort, to investigate the relationship between learning set size and retrieval effort. Participants learnt paired-associates (PAs) in blocks with varying learning set sizes. We

measured pupil size using a head-mounted eye-tracking system while memory for the PAs was tested at the end of each block. Pupil dilation evoked by target item retrieval was positively related to learning set size. We suggest that this effect is driven by the higher retrieval effort associated with retrieving target items from larger learning sets.

**A-0815 Encoding vs. retrieval mode modulates subsequent memory for scene images**

Nora A. Herweg [1], Tobias Sommer [1], Nico Bunzeck [1,2]
[1] Department of Systems Neuroscience, University Medical Center Hamburg-Eppendorf, Hamburg, Germany; [2] Department of Psychology, University of Luebeck, Luebeck, Germany

The processing of old and new information is modulated by contextual factors and might shape recognition memory performance. Using fMRI and simultaneous eye movement recordings, we investigated this hypothesis by means of two different task contexts. Participants were required to discriminate a set of old and new scenes based on (i) visual features (indoor/outdoor) or (ii) their explicit memory (old/new). As such, the two tasks primarily induced encoding- or retrieval-related mechanisms, respectively. Subsequently, recognition memory for all images was tested. The explicit recognition task led to higher subsequent memory performance and preliminary fMRI data suggest changes in mesolimbic activation as the underlying neural mechanism. Our findings further clarify the effects of task context on novelty processing and subsequent memory.

**A-0818 A genetic variant of the noradrenergic system alleviates the stress-induced shift towards procedural learning**

Lisa Wirz [1], Jan Wacker [2], Martin Reuter [3], Lars Schwabe [1]
[1] Department of Cognitive Psychology, Institute for Psychology, University of Hamburg, Germany; [2] Institute for Psychology, University of Hamburg, Germany; [3] Department of Differential & Biological Psychology, Institute for Psychology, University of Bonn, Germany

Stress shifts memory from hippocampal to striatal control, but not all individuals are equally susceptible to this shift. We examined a deletion variant of the α2b-adrenergic receptor gene (ADRA2B), related to increased noradrenergic amygdala activation, as a potential source of these individual differences. Participants (N=252) were genotyped, underwent a stress or control manipulation and performed a learning task that can be supported by the hippocampus and the striatum. Stress led to a shift from hippocampal to striatal learning and this was more pronounced in wild-type compared to deletion carriers. This finding was replicated in an independent, prescreened sample (N=136). We suggest that the ADRA2B deletion variant is associated with stronger amygdala-hippocampus coupling, thus attenuating the stress-induced shift towards striatal learning.

**A-0823 Do changes in resting-state EEG predict spatial working memory decline during aging?**

Giuliana Klencklen, Adeline Jabès, Pamela Banta Lavenex, Catherine Brandner, Pierre Lavenex
Laboratory for Experimental Research on Behavior, Institute of Psychology, University of Lausanne, Switzerland.

Spatial working memory performance declines particularly in about 50% of individuals during normal aging. Interestingly, spontaneous theta activity has been shown to decrease with age, and predict verbal working memory performance in adults. Here, we tested the possible link between changes in resting-state brain activity and allocentric spatial working memory decline during aging. We recorded eyes-closed resting-state EEG in old and younger adults, and tested their real-world allocentric spatial memory performance. We hypothesized that the power of theta might correlate with spatial working memory performance. If this hypothesis is validated, spontaneous brain activity may be used to predict spatial working memory performance and serve as an additional biomarker for screening for memory decline in normal aging and neurodegenerative disorders.

**A-0833 Hippocampal Pattern Completion Serves Successful Binding and Recollection of Multi-Element Events: Functional Evidence at 7Tesla**

Xenia Grande [1,2], James A. Bisby [3,4], Emrah Düzel [1,2,3], Neil Burgess [3,4]
[1] Institute of Cognitive Neurology and Dementia Research, Otto-von-Guericke University Magdeburg, Magdeburg, Germany; [2] German Center for Neurodegenerative Diseases, Magdeburg, Germany; [3] Institute of Cognitive Neuroscience, University College London, London, United Kingdom; [4] Institute of Neurology, University College London, London, United Kingdom

A recent study showed that the hippocampus can complete memories for multi-element events based on partial cues (Horner, Bisby, Bush, Lin, & Burgess et al., 2015). Here, we obtained submillimetre (0.8 mm isotropic) resolution data at 7Tesla using the same paradigm to investigate the hypothesis that hippocampal subfield CA3 is specifically involved in this form of pattern completion. We also test whether incidental pattern completion contributes to hippocampal binding at encoding. Our submillimetre resolution gives us the opportunity to test whether CA3 activity related to pattern completion is associated with input or output layer activation of the entorhinal cortex. The study sheds light on the circuit-level organization of pattern completion in the hippocampus and entorhinal cortex during encoding and retrieval.

**A-0824 The Effects of Memory Load on Time Perception of Facebook and Internet Related Stimuli.**

Lazaros Gonidis, Dinkar Sharma, Joseph Brooks
University of Kent

Previous research has shown that salient stimuli can impact our time perception either by affecting our arousal or attention. Furthermore, concurrent nontemporal tasks can cause interference in our perception of time. In this study, participants performed a time bisection task with Facebook, Internet, or Neutral stimuli in conjunction with a 1-Back or a 2-Back task. Findings suggest that the memory task and the salient stimuli had independent effects on time perception. The 2-Back task (compared to 1-Back task) produced an overestimation of time and worst discriminability whereas the salient (facebook and internet related) stimuli (compared to neutral stimuli) produced an overestimation but better discriminability of time.

**A-0827 Genetically-determined dissociation between allocentric place learning and egocentric response learning in Williams syndrome**

Mathilde Bostelmann [1], Catherine Brandner [1], Floriana Costanzo [2], Silvia Divara [2], Emilie Fragnière [1], Pierre Lavenex [1], Deny Menghini [2], Stefano Vicari [2], Pamela Banta Lavenex [1]
[1] Laboratory for Experimental Research on Behavior, Institute of Psychology, University of Lausanne, Lausanne, Switzerland [2] Department of Neuroscience, Bambino Gesù Children's Hospital, Rome, Italy

Williams syndrome (WS) is a genetic syndrome in which affected individuals exhibit severe visuospatial constructive and memory impairments. To date, however, no study has unequivocally shown whether WS individuals are impaired at using an allocentric spatial representation, which relies on the coherent integration of visual, vestibular and proprioceptive information. We assessed allocentric place learning and egocentric response learning in WS and mental age-matched typically-developing (TD) individuals. As compared to TD children, WS individuals were severely impaired in the allocentric place task, but surprisingly, exhibited superior performance in the egocentric response task. Our results show that not all visuospatial capacities are impaired in WS, and provide behavioral evidence of the genetically-determined dissociation of these two spatial

processing networks in the brain.

**A-0831 Memory, attention and executive function in adults with cystic fibrosis (CF)**

Helen K Chadwick [1,2], Alison Morton [2], Clare L Lawton [1], Louise Dye [1], Michael W Mansfield [2], Daniel Peckham [2]
[1] University of Leeds, UK; [2] Leeds Teaching Hospitals NHS Trust, UK

Individuals who have impaired glucose regulation are susceptible to cognitive deficits. Up to 50% of adults with cystic fibrosis (CF) will develop CF related diabetes. Tests of memory (verbal, visual and spatial), attention and executive function were performed in 147 participants (49 with insulin-treated CF related diabetes, 49 with CF without diabetes, 49 healthy matched controls) using CANTAB. Overall, controls performed significantly better than patients with CF related diabetes. Performance was similar for both groups of patients with CF except for verbal memory and executive function. The finding that patients with CF but without diabetes show some degree of dysfunction might reflect the continuum of glucose tolerance. Cognitive deficits in CF have implications for treatment adherence and quality of life.

**A-0832 Aberrant brain oscillations reveal episodic memory formation impairments in schizophrenia patients**

Federica Meconi [1], Sarah Straub [2], Heidelore Backes [3], Michael Landgrebe [4], Berthold Langguth [4], Karl-Heinz T. Baeuml [5], Simon Hanslmayr [6]
[1] Department of Developmental and Social Psychology, University of Padova, Italy [2] Department of Neurology, University of Ulm, Ulm, Germany [3] Department of Psychiatry and Psychotherapy, Philipps-University Marburg, Marburg, Germany [4] Department of Psychiatry and Psychotherapy, University of Regensburg, Regensburg, Germany [5] Department of Experimental Psychology, University of Regensburg, Regensburg, Germany [6] School of Psychology, University of Birmingham, Birmingham, UK

Episodic memory impairment is a core feature of schizophrenia. However, our understanding about the underlying neurophysiological mechanisms for this deficit is scarce. Different brain oscillations reflect different neurocognitive operations and are therefore a potentially useful biomarker for cognitive deficits affected by schizophrenia. We recorded electroencephalographic activity in healthy and schizophrenic participants while performing a subsequent memory task. Healthy, but not schizophrenic, participants showed left prefrontal beta desynchronization for subsequently remembered when compared to subsequently forgotten words. Furthermore, patient's whose beta power decrease patterns were more similar compared to healthy performed better in the memory task. Taken together, these findings show that left prefrontal beta desynchronization is a sensitive marker of memory impairment in schizophrenia.

**A-0834 Memory Impairments in Patients with Vestibular Disorder.**

Laura Smith [1], David Wilkinson [1], S Surenthiran [2], Rowena Bicknell [1], Mayur Bodani [1,3]
[1] The University of Kent, UK [2] Medway NHS Foundation Trust, UK [3] Kent and Medway NHS Foundation Trust, UK

Clinical and laboratory approaches continue to show that the vestibular system not only regulates autonomic activity but also influences cognition, particularly memory. To aid understanding of these interactions, we investigated the prevalence and types of cognitive impairment in 100 patients with primary vestibular disorder. A neuropsychological battery was administered including measures of working memory capacity, retention and strategy; short-term visual memory; and spatial learning. All patients showed evidence of clinical impairment on at least one neuropsychological test. Working memory capacity and retention limits were the most common problem (over 55% fell outside the norm). These findings suggest the vestibular system exerts a wider influence on memory than previously proposed, and underlines the need for cognitive assessment in vestibular disorders.

**A-0835 Sleep Enhances Routes not Regions**

Hannes Noack [1], Wiebke Schick [2], Hanspeter Mallot [2], Jan Born [1]
[1] Institute for Medical Psychology and Behavioral Neurobiology, University of Tübingen, Tübingen, Germany; [2] Cognitive Neuroscience, University of Tübingen, Germany

Sleep is thought to transform memory traces by abstracting the gist of previous experiences. Here we tested for this assumption in the spatial memory domain. Participants were familiarized with an iterated y-maze before a day of wakefulness or a night of sleep. The maze was implicitly segmented into three regions by the semantic categories of its landmarks (e.g. animals, furniture). Being asked to travel the shortest way from one place in the maze to the other, participants preferentially chose to take the option that included less region crossings when two options of equal length were available. Sleep -compared to wakefulness- enhanced route memory (less errors) but not the formation of semantic regions (route preference).

**A-0836 Rapid and independent memory formation in the parietal cortex**

Svenja Brodt, Dorothee Pöhlchen, Virginia L. Flanagin, Stefan Glasauer, Steffen Gais, Monika Schönauer
Institute of Medical Psychology and Behavioral Neurobiology, Eberhard Karls Universität, Tübingen, Germany

Previous evidence indicates that the brain stores memory in two complementary systems, allowing both rapid plasticity and stable representations at different sites. For memory to be established in a long-lasting neocortical store, many learning repetitions are considered necessary after initial encoding into hippocampal circuits. We show that during navigation in an unknown virtual environment the posterior parietal cortex encodes spatial memories rapidly, beginning with the first visit to a location and steadily increasing activity with each additional encounter. Hippocampal contribution and connectivity between both regions decreases at the same time. The emerging parietal representation is specific for individual episodes of experience, predicts behavior and remains stable over offline periods, and must thus hold a mnemonic function.

**A-0837 Impact of activated self-story on prospective memory**

Olga Mironiuk–Gracz [1,2], Aleksandra Krogulska [1,2], Jerzy Trzebiński [2]
[1] Jagiellonian University, Cracow, Poland; [2] University of Social Sciences and Humanities, Warsaw, Poland

Narration processes are inherently connected to functioning of the retrospective long-term memory. In our study we investigated whether activation of the self-story increases prospective memory for intentions related to the content of this story. One hundred twenty university students participated in our experiment. They were asked to name the intentions they planned to realize during following two weeks. Next, half of them described a self-story of their student's life whereas others were asked to describe specified spaces in university surrounding, e.g. lecture rooms. After two weeks the realization of intentions was measured. We have analysed differences in effectiveness of prospective memory between the experimental conditions (self-story vs. description of spaces), taking into account self-reported environmental constrains and student's meta-memory judgments.

**A-0838 The BDNF val66met polymorphism affects the Level of Processing effect of memory: A deep and shallow rTMS study.**

Anna Shpektor [1], Nikola Vukovic [1,2], Enea Francesco Pavone [3], Matteo Feurra [1,4]
[1] School of Psychology, Centre for Cognition and Decision Making, National Research University Higher School of Economics, Russian Federation.

[2] Center of Functionally Integrative Neuroscience, Institute for Clinical Medicine, Aarhus University, Denmark [3] Social and Cognitive Neuroscience Lab, IRCCS Santa Lucia Foundation, Rome, Italy [4] Department of Medicine, Surgery and Neuroscience, Unit of Neurology and Clinical Neurophysiology, Brain Investigation & NeuromodulationLab. (Si-BIN Lab), Azienda Ospedaliera Universitaria of Siena, Policlinico Le Scotte, Siena, Italy

In the current experiment we investigated how the Val66Met polymorphism on the Brain-Derived Neurotrophic Factor (BDNF) gene affects plasticity and memory performance. In addition by using perturbation repetitive Transcranial Magnetic Stimulation (rTMS) we aimed to understand the causal role of dorsolateral prefrontal cortices (DLPFCs) underlying retrieval processes accordingly to the Val66Met polymorphism. Thus, we adopted a classical deep and shallow memory task; episodic encoding was TMS-free while 10Hz neuronavigated rTMS was delivered during retrieval over the left and right DLPFC, Vertex (control site) and a no-TMS condition. Preliminary data show that, left DLPFC-rTMS at retrieval abolished the beneficial effect of deep encoding. This effect is specific only for ValVal carriers.

**A-0839 The effect of transcranial direct current stimulation of right prefrontal cortex on the effectiveness of different learning strategies**

Miklós Marián [1], Ágnes Szőllősi [1], Márta Zimmer [1], Mihály Racsmány [1,2]

[1] Department of Cognitive Science, Budapest University of Technology and Economics, Hungary; [2] Research Group of Frontostriatal Disorders, Hungarian Academy of Sciences

It has been widely demonstrated that the prefrontal cortex (PFC) has a role in learning and retrieval. Here we investigated whether stimulation of this area affects the effectiveness of different learning strategies. Subjects learned Swahili-Hungarian word pairs, followed by transcranial direct current stimulation. Participants received either anodal or sham stimulation over the right PFC. Then, half of the word pairs were repeatedly studied (restudy condition) and the other half was repeatedly tested (retest condition). After a one week delay participants took a final test for all learned word pairs. According to our results, anodal stimulation of the right PFC affects the overall recall rate, and has differential effects on the recall performance for words practiced by retesting or restudying.

**A-0843 Lie to me: Vulnerability of fMRI-based lie detection to covert counter measures**

Lorena Deuker, Rebekka Heinen, Alina Renner, Denise Siemons-Lühring, Nikolai Axmacher

Department of Neuropsychology, Institute of Cognitive Neuroscience, Ruhr-University Bochum, Bochum, Germany

Lie detection is a controversial area of application for functional magnetic resonance imaging (fMRI), especially because the decoding of deception might be vulnerable to counter-measures. However, it remains unclear under which conditions counter-measures are successful. Here, we combined highly salient stimuli with self-motivated lying to assess whether counter-measures prevent decoding. We trained a linear support vector machine to distinguish between famous/unknown faces in a baseline task, and applied it to a task in which participants chose to lie about the face's famousness (while using counter-measures). FMRI-based decoding accuracy for famous/unknown faces was significantly above chance in the baseline task. Decoding accuracy during the lie condition may provide more insight into the vulnerability of fMRI based decoding to deceptive counter-measures.

**A-0847 How robust is the relational eye movement effect? A replication attempt with objects.**

Marton Nagy, Ildiko Kiraly

Eotvos Lorand University, Department of Cognitive Psychology, Budapest, Hungary

We used a relational learning paradigm (Hannula et al., 2009) to test whether the relational eye movement effect (REME) is present when the category of the target stimulus is changed from faces to objects. In two experiments participants had to study face-scene (Exp. 1) or object-scene (Exp. 2) pairs. At test, after presented with a scene they had to choose the matching face/object from three alternatives (3AFC) while eye movements were recorded. Using faces as targets our results replicated previous findings showing both a rapid and a response-locked REME. However when using objects both REME results disappeared. These results raise questions about the REME as a necessary precursor of relational retrieval. We discuss different interpretations of our results.

**A-0849 Event-based prospective memory in children with autism spectrum disorder – Influence of prospective memory task focality and ongoing task memory demands**

Julia Landsiedel, David Williams

School of Psychology, University of Kent, Canterbury, UK

Remembering to carry out our future plans (prospective memory; PM) is crucial in everyday life. Individuals with autism spectrum disorder (ASD) report difficulties with PM, but laboratory-based studies have not found consistent impairments. In two experiments, we explored whether individuals with ASD only perform well under certain task characteristics, or by employing compensatory strategies. Currently, 15 children with ASD and 15 age- and IQ-matched controls have completed two PM tasks in which (a) PM cue explicitness (or "focality"), or (b) whether the ongoing task (in which the PM cue is embedded) required verbal or visuospatial memory was systematically manipulated. Results show no between-group differences in levels of performance (ps>0.05, ds

**A-0851 Electrophysiological correlates of episodic memory retrieval are material sensitive**

Anna Karlsson, Inês Bramão, Mikael Johansson

Department of Psychology, Lund University, Sweden

It remains unclear whether the event-related potential (ERP) correlates of episodic memory are modulated by the type of information retrieved. In two experiments, we recorded electrophysiological brain activity while participants discriminated between old and new items from three different stimulus categories (faces, objects, and words). In the first experiment, we used a randomized event-related design, whereas in the second experiment we used a block design. In both experiments, analyses of the electrophysiological data revealed robust ERP old/new effects for all types of material that differed in their qualitative characteristics, including topographical distribution. Our findings suggest that non-overlapping neural mechanisms support retrieval of mnemonic information differing in terms of perceptual and lexical characteristics.

**A-0853 A close link between reward dependent invigoration, theta oscillations and structural integrity of the dopaminergic system during healthy aging**

Tineke K. Steiger [1,2], Nico Bunzeck [1,2]

[1] Department of Psychology, University Luebeck, Germany; [2] Department of Systems Neuroscience, University Medical Center Hamburg-Eppendorf, Germany

Healthy aging is associated with structural declines of the dopaminergic system but the behavioral consequences remain unclear. To investigate this issue, we used EEG and structural MRI in young and elderly subjects. In a reward-learning paradigm, scene images were encoded by pairing

them with cues predicting either high or low monetary rewards. Behaviorally, response times were modulated by reward magnitude for the young but not elderly subjects. This pattern was resembled in the theta band (4-8 Hz), and individual differences in the elderlies' response time could be explained by the structural integrity of the dopaminergic substantia nigra (as measured by magnetization transfer). This suggests a close relationship between reward based invigoration, theta oscillations and age-dependent changes of the dopaminergic system.

**A-0856 Does statistical learning contribute to decision making under uncertainty?**

Noémi Éltető [1], Karolina Janacsek [1,2], Andrea Kóbor [3], Ádám Takács [1], Dezso Nemeth [1,2]
[1] Institute of Psychology, Eötvös Loránd University, Budapest, Hungary; [2] MTA-ELTE NAP B Brain, Memory and Language Lab, Institute of Cognitive Neuroscience and Psychology, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary; [3] Brain Imaging Centre, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary

In uncertain decision situations, where the relationship between actions and rewards/outcomes is rather probabilistic than precisely computable, statistical learning might play an important role. We investigated the relationship between implicit statistical learning (measured by the Alternating Serial Reaction Time Task, ASRT) and decision making under risk/uncertainty (assessed by the Balloon Analogue Risk Task, BART) between 10 and 24 years of age. Uncertainty in the BART elicited a risk-averse pattern, resulting generally in suboptimal performance – but this depended on statistical learning performance. We found a moderate positive correlation between the learning performance in the ASRT task and the risk taking propensity in the BART, irrespectively of age. We therefore suggest that implicit statistical learning facilitates more optimal decisions under uncertainty.

**A-0857 Cross-Modal Ranschburg Effects.**

Rachel Skinner, Andrew J. Johnson
Department of Psychology, Bournemouth University, UK

The Ranschburg Effect (a reduction in recall accuracy for a repeated item within a sequence) has only previously been demonstrated with verbal stimuli. The present experiment examined the effect of within-sequence repetitions for visual stimuli. Sequences of 6-faces were followed by a serial order reconstruction test procedure in which participants could select the same item multiple times. Within-sequence repetitions of adjacent items produced recall facilitation. However, when repetitions were separated by 2-intervening items there was no facilitation or reduction in recall (the Ranschburg Effect). Furthermore, there was no evidence that the Ranschburg effect was affected by stimuli set-size. These findings suggest that visual memory operates qualitatively differently to verbal memory regarding within-sequence repetitions, supporting modular/domain-specific theories of working memory.

**A-0860 Non-stimulus dependent factors are essential when predicting reaction times in an implicit learning task**

Balázs Török [1], Karolina Janacsek [2,3], Dávid G. Nagy [4,5], Gergő Orbán [4], Dezso Nemeth [2,3]
[1] Department of Cognitive Science, Budapest University of Technology and Economics, Budapest, Hungary; [2] MTA-ELTE NAP B Brain, Memory and Language Research Group, Institute of Cognitive Neuroscience and Psychology, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary; [3] Institute of Psychology, Eötvös Loránd University, Budapest, Hungary; [4] MTA Wigner Research Centre for Physics, Budapest, Hungary; [5] Institute of Physics, Eötvös Loránd University, Budapest, Hungary

Decline of performance over a period of continuous training (referred to as reactive inhibition) can greatly confound analysis and distort conclusions of learning experiments. The goal of our study was to develop a method for measuring and filtering reactive inhibition in order to establish a more reliable and refined (subject by subject, trial by trial) analysis of learning. One hundred eighty subjects participated in our experiment. The Alternating Serial Reaction Time task was used to measure visuo-perceptual learning. A regression model is proposed to explain variability in subject responses that are solely related to reactive inhibition rather than task variables relevant for learning. Our findings suggest that a mathematical treatment of reactive inhibition is essential for predicting reaction times.

**A-0862 Alexithymia and emotional memory formation: Implications for the development of intrusive memories**

Alexandra-Heike Gräbener, Roxanne Sopp, Tanja Michael
Clinical Psychology and Psychotherapy Unit, Saarland University, Saarbrücken, Germany

Alexithymia is considered a relatively stable trait reflecting deficits in cognitive processing and regulation of emotions. These alterations are assumed to contribute to the onset of psychiatric disorders, presumably by exhibiting differential effects on memory formation. The present study aimed to investigate the effect of alexithymia on emotional memory. Data are currently collected and preliminary analysis (n=9) showed significant associations between alexithymia levels and the amount of intrusive memories occurring after an analog trauma (ρ=.80; p

**A-0864 The relation between affective symptoms and memory functioning in school age children**

Alexandra Sabou [1,2], Cristina Trifan [1,2], Mircea Miclea [2,3], Laura-Visu Petra [1,2]
[1] Developmental Psychology Lab, Cluj-Napoca, Romania; [2] Department of Psychology, Cluj-Napoca, Romania; [3] Applied Cognitive Psychology Center, Cluj-Napoca, Romania;

The present study aims to expand our understanding concerning the impact of affective symptoms upon memory functioning. Using a chronometric analysis of recall, we measured the time children took to prepare their answers (preparatory intervals), to pause between words (interword pauses), and to verbalize each word (word durations). The participants were 97 school age children (55 girls, M = 11.26, SD = 0.52). Results indicated that children with higher state anxiety took longer to prepare their answers (Nonword & Listening span). Also, increased depression was associated with longer pauses on Word span and longer preparatory intervals on Listening span. Our results provide insights into the memory mechanisms impacted by affective symptoms, supporting the Attentional Control Theory (Eysenck et al., 2007).

**A-0865 Meta-analysis of age differences in involuntary thoughts: preliminary results**

Magda Jordão [1], Maria Salomé Pinho [1], Peggy L. St. Jacques [2], Mickael Mendes
[1] Cognitive and Behavioral Center for Research and Intervention (CINEICC), University of Coimbra, Portugal; [2] School of Psychology, University of Sussex, UK.

Does the frequency of involuntary thoughts (ITs) decrease with age? To explore this question we conducted a meta-analysis to summarize studies on ITs and aging. Preliminary results comprising mind-wandering (MW) and task-unrelated thoughts (TUTs) revealed a significant decrease with age. Additional moderation analysis indicated that greater differences in education translate to an age-effect reduction. Separate analysis of MW, TUTs, self and probe-caught studies revealed that education moderated age-effects for MW and self-caught only. Education may increase task-related interference in MW and awareness of ITs in self-caught. These results and additional analysis of ITs (including memories) will be discussed considering current accounts of the age-related decrease and the need for more specific conceptualizations of ITs in order to interpret age-related differences.

**A-0866 Examining the self-reference-effect in normal aging in a new episodic memory test based on the Self-Memory System model.**
Caroline Bendahan, Michalina Radomska, Martial Van der Linden
Cognitive Psychopathology and Neuropsychology Unit, University of Geneva, Switzerland
Traditional tests assessing episodic memory in clinical settings do not take the importance of the Self into account. We thus developed a new test: the Self and Memory Test (SMT), building on Conway's Self-Memory System model (2005). The SMT consists in an incidental self-referential encoding of 16 pictures depicting daily living activities with an immediate (5 minutes after encoding) and a delayed recall (7 days later). The self-referential memory effect was examined by administrating a self-referential versus an other-referential encoding to two groups of healthy older adults. Results indicate that self-referential encoding enhances the amount of activities and picture details recalled. These findings highlight the importance of including the Self in episodic memory assessment.

**A-0870 The influence of cognitive reappraisal and expressive suppression on memory of an amusing emotional event**
Karolina Czarna [1], Dorota Kobylińska [2], Peter Lewinski [3]
[1] The University of Manchester; [2] The University of Warsaw; [3] The University of Neuchâtel
We investigated whether emotion regulation (ER) influences memory of an emotional event. In two studies participants watched an amusing video and regulated emotions via cognitive reappraisal or expressive suppression. Shortly after, they took part in an unexpected verbal memory test. In both experiments watching the video significantly increased participants' amusement while ER strategies influenced the level of expressed emotions. In the first online experiment ER had no influence on memory performance. In the second in-lab experiment the influence of ER on memory reached a tendency toward significance. The results show that expressive suppression may have a potential to impair memory for an emotional event. Cultural differences and study design may, however, play a role in studies on ER.

**A-0873 The Method of Loci revisited: Memory enhancement by way of virtually augmented memory palaces**
Nicco Reggente, Joey Ka-Yee Essoe, Priyanka Mehta, Ai Ohno, Jesse Rissman
[1] Department of Psychology, University of California, Los Angeles
Humans have long appreciated that visuospatial cues can serve as a scaffolding for the encoding of non-spatial content. The ancient Method of Loci (MoL) mnenomic, which involves mentally binding items to a spatial context, remains a favored strategy of modern memory champions. In the present study, we created a virtual reality implementation of the MoL to tease apart the factors that contribute to its efficacy. Participants were given sequences of objects to memorize in each of three distinctive virtual environments. Those participants who were instructed to place the items at locations of their choosing showed significantly better recall for both object identify and order than control group participants who merely viewed the objects as they navigated the world.

**A-0880 DRM false memories susceptibility in (non-clinical) schizotypy**
Hedwige Dehon[1], Julien Laloyaux [1], Sanaa Belayachi [1], Frank Laroi [1 2]
[1] Psychology and Neuroscience of Cognition Research Unit (PsyNCog), University of Liège, Liège, Belgium; [2] Department of Biological and Medical Psychology, University of Bergen, Bergen, Norway
Previous research has indicated particular semantic activation (e.g., Saunders et al., 2012) and impaired controlled memory processes (e.g., Stefaniak et al., 2015) in schizotypy. Because DRM false memories (Roediger & McDermott, 1995) capitalize on strong semantic activation inefficiently monitored by reality monitoring processes (e.g., Dehon et al., 2008), it was hypothesized that schizotypy would affect false memory production. Participants were presented with DRM lists for a recall test and completed the Schizotypal Personality Questionnaire (Raine et al., 1994) and measures of depression and anxiety to control for these factors. Results showed that participants scoring high on the Cognitive-Perceptual and/or Disorganized factors recalled similar rates of studied items but more "critical items" than participants scoring low on these factors.

**A-0883 Memory span training or executive working memory training: what works best for children with learning disabilities?**
Antonia Hogrefe, Barbara Studer, Stefan Kodzhabashev, Walter Perrig
University of Berne, Berne, Switzerland
The study compares a memory span training and an executive working memory training for students with learning disabilities. Transfer on executive functions was assessed. 43 students with learning disabilities (aged 8 – 17) were randomly assigned to the trainings. After six weeks of training students improved in concentration, executive working memory and reading. Memory span training showed additional improvement in memory. Compensatory effects were found in the executive working memory training: children with low IQ showed higher transfer on executive functions than children with high IQ. Memory span training and executive working memory training have the potential to improve executive functioning in children with learning disabilities. Executive working memory training apears to be especially suitable for cognitively weaker children.

**A-0884 Retrieval-Induced Forgetting can change emotional evaluation of stories**
Jeremy Yamashiro, William Hirst
The New School for Social Research, New York, USA
Retrieval-induced forgetting (RIF) is a counterintuitive pattern of remembering resulting from selectively remembering some information and leaving other information unmentioned. Among unmentioned material, items that are closely associated with the practiced items become less accessible than items that are unassociated. Almost all previous research has focused on the conditions under which RIF occurs. We look at how the phenomenological characteristics of a memory shift when it is reshaped due to RIF. Participants learned a series of emotional stories, and selectively practiced non-focal, emotionally neutral elements of the stories. This induced RIF for the central, emotional elements. Overall emotional strength of the stories attenuated, and this reduction in emotional strength could be attributed to RIF of the emotional propositions.

**A-0885 Capturing positive autobiographical memory characteristics' effect on mood in daily life using ecological momentary assessment**
Christina Haag [1,2], Arnaud Pictet [3], Rainer Krähenmann [2], Birgit Kleim [1,2]
[1] Department of Experimental Psychopathology and Psychotherapy, University of Zurich, Switzerland; [2] Department of Psychiatry, Psychotherapy and Psychosomatics, University of Zurich, Switzerland; [3] Department of Psychology, University of Geneva, Switzerland
Retrieving positive autobiographical memories is an effective emotion regulation strategy associated with increased well-being. Psychopathology, such as depression, is linked with difficulties in retrieving specific positive autobiographical memories. Depressed subjects often retrieve less vivid, sensory detailed memories that are afflicted with rather negative affect and increase or maintain negative mood. The present study aimed to investigate the effect of positive autobiographical memory retrieval on affect in daily life using ecological momentary assessment (EMA).

Participants with and without dysphoria documented characteristics of naturally occurring positive autobiographical memories, such as vividness, daily positive and negative affect. Pilot data (n=20) will be presented that indicate significant associations between memory characteristics and affect. Clinical implications of our findings will be discussed.

**A-0886 The impact of napping on memory for future-relevant stimuli: Prioritization among multiple salience cues**

Kelly A. Bennion [1,2], Jessica D. Payne [3], Elizabeth A. Kensinger [1]
[1] Boston College, Chestnut Hill, MA, USA [2] California Polytechnic State University, San Luis Obispo, CA, USA [3] The University of Notre Dame, Notre Dame, IN, USA

This study investigated how sleep prioritizes information when multiple salience cues (e.g., emotion, reward, knowledge of a later test) co-occur. Participants encoded scenes that were future-relevant based on emotion, reward, and instructed learning (intentionally versus incidentally encoded), preceding a delay consisting of a nap, wakefulness, or nap followed by wakefulness. Recognition testing showed that sleep prioritized top-down, goal-directed cues (instructed learning, reward) over bottom-up, stimulus-driven characteristics (emotion). The effect of a nap on intentionally encoded information was especially strong for neutral (versus emotional) information, suggesting that once one cue for future relevance is present, there are diminishing returns with additional cues. Sleep may binarize information based on whether it is future-relevant or not, preferentially consolidating memory for the former category.

**A-0887 Adaptation of an eCorsi version: the elaboration and implementation of a modified Corsi block-tapping task for digital tablets measuring visuo-spatial short-term and working memory**

Farcas Susana [1], János Réka [2], Batiz Enikő [2]
[1] PhD. student, Babeş-Bolyai University, Evidence based Assessment And Psychological Interventions Doctoral School, Cluj-Napoca, Romaniarn[2] Lect. Dr., Babeş-Bolyai University, Faculty of Psychology and Educational Sciences, Department of Applied Psychology, Cluj-Napoca, Romania

The Corsi block-tapping task is widely known as a neuropsychological test used to assess visuo-spatial working memory. Originally the test is administered using nine identical square blocks positioned on a board. The task requires reproduction of a sequence. Several digital versions have since been developed. In this study, we tested participants in forward, backward recall order with a modified version of the Corsi task for digital tablets. This version contains geometric figures: square, triangle, circle. Two different conditions were developed: one with no grid (hidden) and one with a visible grid. The aim of this study was to compare recall accuracy and performance on the two different conditions. Values and limits of the modified eCorsi are discussed in the paper.

**A-0888 Neural Substrates of Egocentric Perspective in Autobiographical Memory**

James L. Keidel [1], Daniel L. Schacter [2], Peggy L. St. Jacques [1]
[1] University of Sussex [2] Harvard University

When we retrieve memories for events from our personal past we rely on mental imagery processes to visualize the content of our memories from a particular egocentric perspective. In this fMRI study we used multivariate analysis to investigate the neural substrates of autobiographical memories that were retrieved from an own eyes or observer perspective. Activity patterns in several frontal and parietal regions were predictive of the particular visual perspective taken. Representational similarity analysis revealed extensive and consistent memory-specific activation patterns that both overlapped and diverged from those regions whose activation was predictive of visual perspective. Taken together, these results indicate that the mechanisms underlying egocentric perspective are at least partly independent of those involved in representing memory content.

**A-0890 Neural Mechanisms of Visual Perspective on the Construction and Elaboration of Autobiographical Memory Retrieval**

Heather M. Iriye, Petra Marcotti, Peggy L. St. Jacques
University of Sussex

Visual perspective, recalling an event either from one's own eyes or the eyes of an observer, is a fundamental aspect of autobiographical memory (AM) retrieval. Yet the neural mechanisms supporting its influence are still unclear. The present fMRI study separated construction and elaboration phases of retrieval to investigate the influence of visual perspective in AM. Participants either retrieved memories from a specified visual perspective or created mental scenes associated with spatial locations. Preliminary results (n=6) indicated that the precuneus was recruited to a greater extent in the observer relative to own eyes condition during memory retrieval compared to scene construction. We will discuss how visual perspective affects phase specific effects of AM retrieval.

**A-0891 Domain-specific working memory advantage in synaesthetes**

Katrin Lunke [1,2], Stefan Walter [1,2], Beat Meier [1,2]
[1] University of Bern, Bern, Switzerland; [2] Center for Cognition, Learning and Memory, Bern

Synaesthesia is a phenomenon in which the perception of a distinct stimulus, called inducer-for instance a letter or sound-elicits a concurrent sensation, often a coloured experience. Past studies have shown better memory performance for synaesthetes compared to non-synaesthetes. Differences in the cognitive system, during encoding or retrieval in the domains of the inducer or the concurrent may explain this benefit. We tested four groups of synaesthetes (grapheme-colour, sound-colour, grapheme-and-sound-colour and sequence-space-synaesthetes) and four matched control groups. Participants completed a visually presented numeral working memory task. The results show a significantly higher performance of sequence-space-synaesthetes and a numerically higher performance of grapheme-colour-synaesthetes. This argues for a working memory advantage for stimuli of the domain that elicits the synaesthetic experience.

**A-0892 The effect of prior context on conceptual integration**

James L. Keidel, Christiane S. H. Oedekoven, Andreea C. Tut, Chris M. Bird
University of Sussex

Everyday experience entails rapid and automatic integration of conceptual information by the semantic network. In this study we investigated processing of video stimuli that independently manipulated availability of specific and general contextual information. Availability of specific information significantly increased activity in left middle temporal gyrus and anterior temporal lobe, while general information increased activity in the bilateral precuneus. Only the left angular gyrus showed a significant response to both types of context. We interpret these results in terms of a division of labor in which the precuneus preferentially represents larger-scale visual semantic aspects of the incoming stimulus while the left temporal lobe maintains conceptual links required to integrate specific information over multiple time scales.

**A-0893 The latent dimensional structure of episodic memory for real-world and virtual experiences in younger and older adults**

Nick Diamond [1,2], Hervé Abdi [3], Brian Levine [1,2]

[1] University of Toronto, Toronto, Canada; [2] Rotman Research Institute, Baycrest Health Sciences, Toronto, Canada; [3] The University of Texas at Dallas, Richardson, USA
To bridge the gap between naturalistic and laboratory assessments of episodic memory, we designed a rich, interactive and controlled real-world encoding event – a “staged event” – and a content-matched virtual event. We tested recognition memory for these two events in younger and older adults. Using Multiple Correspondence Analysis, we found that overall memory accuracy explained most of the variance, with both younger and older participants exhibiting greater accuracy in the real-world than in the virtual encoding condition. We found another significant dimension representing response bias, and distinct latent structures for objective and subjective components of episodic memory. Our findings suggest that real-world and virtual encoding conditions recruit partially distinct component processes, with naturalistic encoding processes eliciting richer context reinstatement.

**A-0894 Across-episode memory formation is facilitated by their conceptually-related overlapping content**
Berta Nicolás [1,2], Lluís Fuentemilla [1,3]
[1]Cognition and Brain Plasticity Group. Institute of Biomedicine Research of Bellvitge (IDIBELL). L’Hospitalet de Llobregat (Spain) [2]Department of Basic Psychology. University of Barcelona (Spain) [3]Institute of Cognitive, Brain and Behavior (Spain)
Individual experiences often overlap in their content, offering the possibility to build links across separate events. However, in daily-life different episodes rarely occur within the same scenario (i.e., entrance of the Parc Güell) and links among them need to be created on the bases of more abstract overlapping features (e.g., parks in Barcelona). Here, participants engaged in a two-phase learning and generalization task, wherein they learned an intermixed set of associations (i.e., face-scene) that overlapped by same scene or by conceptually-related scene information and subsequently generalized to novel stimulus combinations. Participants successfully learned the associations and were capable to generate inferences in both conditions, indicating that the emergence of across-episode memory representations can rely on overlapping content of conceptual nature.

**A-0896 Repeated study of items with and without repeated context: aging effects on recollection and familiarity**
Caitlin R. Bowman [1], John M. Huhn III [2], Nancy A. Dennis [2]
[1] University of Oregon, Eugene, USA; [2] The Pennsylvania State University, University Park, USA
Presenting items multiple times during encoding is a common way to enhance recognition. Under such conditions, older adults often show an increase in false recognitions that counteracts benefits of repeated study. This study tested whether this aging effect was maintained when items were repeated without also repeating their study context. Results showed that, compared to items repeated in the same context, items repeated across different contexts showed both the highest recognition accuracy for older adults and no significant age differences, taking both hits and false recognitions into account. However, memory enhancements for repeated study in the same context were driven by boosts to recollection responses in both age groups, whereas repeated study in different contexts primarily increased estimates of familiarity.

**A-0898 Neural correlates of Focal and Nonfocal prospective memory tasks in 6-year-old children.**
Ana Belén Cejudo Garcia, Almudena Ortega Segura, Teresa Bajo Molina
Department of Experimental Psychology. University of Granada
Prospective memory (PM) is involved in performing intended actions in the future (Einstein & McDaniel, 1990). In focal PM-tasks the cue to perform the action can be processed as a part of the ongoing task, while Non-focal PM tasks requires active monitoring processes because the cue is not processed as part of the ongoing task (Einstein & McDaniel, 2005). The aim of the study was to assess the difference between the neural correlates of focal and non-focal tasks in preschooler. EEG recordings showed significant mean amplitude differences between focal and no-focal conditions in N300, the component related to the cue detection (West, 2007), suggesting that as early as 6 years old PM performance depends on active monitoring for cue detection.

**A-0899 The verbal overshadowing effect in children and adults is unrelated to the specific content of descriptions**
Valentine Vanootighem, Serge Brédart, Hedwige Dehon
Psychology and Neuroscience of Cognition Research Unit (PsyNCog), University of Liège, Liège, Belgium.
Verbal descriptions of unfamiliar faces have been found to impair later identification of these faces in children and adults, a phenomenon known as the “verbal overshadowing effect” (VOE, Schooler and Engstler-Schooler, 1990). The present study thoroughly examined the person descriptive abilities of 7–8, 10–11, and 13–14-year-old children and adults and their influence on later identification performance. Our aim was to specifically assess the prediction of the “content” account suggesting that a verbal overshadowing arises because participants generate an inadequate verbal description and later rely upon it during retrieval. Results showed a verbal overshadowing effect in all age groups but neither accuracy, length nor content of descriptions were found to be associated with identification accuracy.

**A-0901 Motor retrieval benefits long-term retention and transfer more than covert retrieval**
Veit Kubik [1,2], Artin Arshamian [1,3], Fredrik U. Jönsson [1]
[1] Department of Psychology, Stockholm University, Stockholm, Sweden [2] Stockholm Brain Institute, Stockholm, Sweden [3] Karolinska Institute, Stockholm, Stockholm, Sweden
Retrieval practice is known to benefit long-term retention. However, to which degree does this direct testing effect rely on memory retrieval itself versus the overt production of remembered responses? In the present study, we addressed this issue in a cued-recall testing-effect paradigm by using verb–noun phrases (e.g., water the plant) because these materials permit motor actions as the overt production format of recall. The results demonstrated a reliable direct testing effect in terms of a cross-over interaction effect. More importantly, practicing motor retrieval trumped practicing covert retrieval on long-term retention and long-term transfer, while it led to equivalent short-term retention. Thus, overtly producing the memory response can magnify the direct testing effect, when additionally enacting verb targets (e.g., water).

**A-0903 Memory accessibility: The effects of retrieval-induced forgetting in analogical reasoning.**
Tania Valle [1], Carlos J. Gómez-Ariza [2], Teresa Bajo [1]
[1] University of Granada, Spain; [2] University of Jaén, Spain
Accessibility to relevant information in memory is thought to be crucial in order to solve problems successfully. Recent studies have shown that inhibitory control can help to overcome fixation while solving creativity problems as well as hinder problem-solving performance itself. In the present study we explore if memory inhibition can impact on analogical problem solving by examining whether words that had previously been the target of inhibitory control were less likely to be chosen as solutions in an analogical reasoning task. We used the Retrieval-Practice paradigm (Anderson et al., 1994) to manipulate the accessibility of words that could be solutions in subsequent analogy problems. Our findings support the idea that

memory inhibition can unwittingly have consequences for reasoning.

**A-0904 Effects of decentering on autobiographical memory after rumination in depression**
Yoshifumi Takahashi[1], Takashi Sugiyama[2]
[1]Graduate School of Human Sciences, Kanagawa University, Japan [2]Department of Human sciences Faculty of Human Sciences, Kanagawa University, Japan
It is known that when induced to ruminate, dysphorics exbit more negative mood and recall more negative memory. Recent studies have suggested that decentering which ability to observe thoughts as objective events in the mind rather than personally identifying with the thoughts can contribute to reduction of rumination. The aim of this study was to evaluate the effects of decentering on autobiographical memory after rumination. Participants scoring high or low in decentering were assigned to negative emotion induction prior to ruminating and completing an autobiographical memory task. The results indicated that participants with a lower decentering recalled negative autobiographical memory after the rumination indution when they become depressed, wheres those with higher decentering did not even if they become depressed.

**A-0906 Multiple deadlines in metric space: Multitasking reflects selectively coordinate, but not categorical, spatial processing**
Veit Kubik [1], Ivo Todorov [1], Fabio Del Missier [1,3], Timo Mäntylä [1]
[1] Stockholm University, Stockholm, Sweden; [2] Stockholm Brain Institute, Stockholm, Sweden; [3] University of Trieste, Trieste, Italy
We often need to monitor and coordinate multiple deadlines. One way to handle these temporal demands might be to represent future deadlines as a pattern of spatial relations. More specifically, we tested the hypothesis that multitasking reflects selective effects of coordinate (i.e., metric) relational processing. Participants completed two multitasking sessions under concurrent processing demands of coordinate versus categorical spatial information. We expected and observed that multitasking impairs concurrent coordinate, rather than categorical, spatial processing. In Experiment 1, coordinate-task performance was selectively decreased, while multitasking performance was equal under both load conditions. When emphasizing equal (primary/secondary) task-importance in Experiment 2, it was only multitasking performance that was selectively reduced under the coordinate-load condition. Thus, effective multitasking may partly reflect coordinate-relational processing.

**A-0912 Retrieval suppression impairs performance in a conceptual implicit memory test**
Jonathan M. Fawcett [1], Andrea Luppi [2], Michael C. Anderson [1]
[1] MRC Cognition and Brain Sciences Unit, Cambridge, UK; [2] Department of Experimental Psychology, University of Oxford, Oxford, UK
Suppressing retrieval of an unwanted memory has been shown to reduce the probability of recalling that memory on an explicit recall task. Here, we address whether suppressing retrieval of an unwanted memory also reduces the accessibility of that memory in a conceptual implicit memory task. After learning a series of cue-target pairs (chair-bill), participants were re-presented with a portion of cues for which they practiced retrieving or suppressing the targets. Participants then completed the Remote Associates Test (RAT) where they received three words (duck/fold/dollar) and tried to produce the common associate (bill). Participants were less likely to solve a RAT problem when the answer had been suppressed – demonstrating that the effects of suppression are not limited to episodic memory.

**A-0913 The role of the dorsolateral prefrontal cortex in the suppression of negative autobiographical memories**
Jonathan M. Fawcett [1], Roland G. Benoit [2], Ana Fotachi [3], Jun Kawaguchi [4], Michael C. Anderson [1]
[1] MRC Cognition and Brain Sciences Unit, Cambridge, UK; [2] Department of Psychology, Harvard University, Cambridge, USA; [3] Department of Psychology, Westminster, London, UK; [4] Department of Psychology, Nagoya University, Nagoya, Japan
Suppressing retrieval of an unwanted word or image has been shown to recruit the right dorsolateral prefrontal cortex to down-regulate hippocampal activity, preventing retrieval of the content and suppressing its representation. Here, we address for the first time whether similar neural mechanisms are engaged to suppress the retrieval of unpleasant autobiographical memories. Participants generated upsetting experiences, providing a personal cue word for each event. They were then re-presented with a portion of those cues for which they practiced retrieving or suppressing the associated memories. Afterwards they recalled the events one final time. Our findings demonstrate that frontal control mechanisms first isolated through laboratory studies of simple materials are also engaged to suppress the retrieval of very upsetting, person-specific memories.

**A-0914 Memory errors for events consistent versus inconsistent with spatiotemporal continuity**
Wen-Chi Chiang, Li-Chen Tseng
National Chung Cheng University, Chiayi, Taiwan
Many studies have suggested that spatiotemporal continuity is crucial for forming and updating object representations in memory. The evidence, however, typically came from tasks focusing on visual perception and attention. The current experiments used a novel and better controlled procedure to examine adults' memory for object displacement events in consistence or in violation of continuity. The participants saw a sequence of events and in later recall selected and/or arranged photographs corresponding to, or deviating from, the sequence. The results showed that (a) the continuity-violating and continuity-consistent events produced similar error rates but different, gist-consistent, error types in immediate recall, and that (b) in delayed recall, continuity-consistent memory distortions became more frequent for continuity-violating object disappearances than for continuity-violating object appearances.

**A-0915 The Effect of Timing and Stimulus Qualities on Feeling-of-Knowing Judgments**
Dilay Z. Karadöller [1,2,3], Aysecan Boduroglu [1], Bennett L. Schwartz [4]
[1] Boğaziçi University, Istanbul, Turkey; [2] Max Planck Institute for Psycholinguistics, Nijmegen, Netherlands; [3] Radboud University, Nijmegen, Netherlands; [4] Florida International University, Miami, USA.
Feeling-of-knowing (FOK) judgments predict future memorability and are shaped by inferential processes, particularly the retrieval of target related partial information. We investigated how partial information and timing affect FOK judgments. To manipulate the amount of accessible partial information, we paired medium frequency cues with targets that either had large/small association sets and weak/strong primary associates. We also manipulated whether judgments were given under time constraint or in a self-paced fashion. We found that people gave higher FOK ratings for cues with strong associates in the self-paced condition, consistent with the idea that they were able to retrieve more partial information with an extended period. Indeed, the amount of partial information retrieved correlated with FOK strength.

**A-0918 Motor determinants of verbal serial short-term memory: Convergent neural and behavioural evidence**
Robert W. Hughes [1], John E. Marsh [2], Cassandra Richardson [2], Melissa Barker [2]
[1] Royal Holloway, University of London; [2] University of Central Lancashire
Several theories ascribe an instrumental role to motor-planning in verbal serial short-term memory (STM; Baddeley, 2007; Hughes et al., 2009;

Jones et al., 2004) while others deny any such role (Lewandowsky & Oberauer, 2015). We provide new convergent neural and behavioural evidence for the motoric basis of verbal serial STM performance. Using functional near-infrared spectroscopy, we found that the pre-supplementary and supplementary motor areas (SMAs) of the brain were activated during a verbal serial-STM task (probed-order recall) and to a greater extent than during a verbal item-STM task (the missing-item task). In a subsequent experiment, a sub-sample of the same participants (exhibiting the same neural dissociation) suffered behavioural interference from changing-state irrelevant sound during verbal serial-STM but not verbal item-STM.

**A-0920 Cognitive effort and Retroactive Interference in Memory Consolidation.**

Marcus Vinicius Costa Alves, Orlando Francisco Amodeo Bueno
Universidade Federal de São Paulo, São Paulo, Brazil.

Retroactive Interference (RI) occurs when new information interferes with previous learned material, disrupting the memory consolidation process. The aim of this study was to investigate whether cognitive effort affects memory consolidation. Three experiments were conducted where wordlists were presented and asked to be recalled after a 3-minute delay; during the delay phase participants performed a Counting task, Random Number Generation tasks (low and high generation) or Counting Span tasks (normal, minimum and maximum span required). Participants had their pupil dilation recorded to measure cognitive effort. Our results suggest that the interfering effect seems to depend on the effectiveness of carrying out the tasks and the cognitive effort required by them.

**A-0926 Sustained processing shifts towards pattern separation versus completion in an associative memory task**

Juan Linde-Domingo, Maria Wimber
University of Birmingham, UK

Human episodic memory has been argued to be capable of separating overlapping episodes to optimize the encoding novel information. We here tested whether a secondary, unrelated task can induce a sustained processing shift towards pattern separation. Participants encoded pairs of room-object associations surrounded by either a verbal encoding or a retrieval task. Overall, the secondary task caused significantly better discrimination performance for overlapping associations whose initial learning was surrounded by novel encoding as opposed to the retrieval. Moreover, this benefit of encoding mode was particularly pronounced in participants not integrating between similar representations. These results indicate a sustained bias towards pattern separation during an encoding mode, creating orthogonalized representations especially when an episode is not incorporated into an existing representation.

**A-0932 Transcranial direct current stimulation to left rostrolateral prefrontal cortex results in divergent effects on memory and reasoning**

Andrew J. Westphal, Corey D. Ngoy, Tiffany E. Chow, Laryssa A. Storozuk, Vivian Liao, Megan A. K. Peters, Allan D. Wu, Ladan Shams, Jesse Rissman
University of California, Los Angeles

Left rostrolateral prefrontal cortex (RLPFC) has been demonstrated to be involved in cognitive control processes in episodic memory retrieval and analogical reasoning using neuroimaging techniques (e.g., Westphal et al., 2016). Here, we aimed to assess the causal role of left RLPFC in episodic retrieval and analogical reasoning through non-invasive transcranial direct current stimulation to left RLPFC, with right motor cortex as the reference site. All participants began the experiment by receiving sham stimulation. For the second half of the study, participants were separated into three groups that received either sham stimulation again, left RLPFC anodal stimulation, or left RLPFC cathodal stimulation. Anodal stimulation significantly improved participants' ability to correctly recollect source details, while cathodal stimulation improved analogical reasoning abilities.

**A-0938 Impact of cardiovascular training on visual working memory related EEG oscillations**

Alondra Chaire [1], Andreas Becke [1,2], Emrah Düzel [1,2]
[1] Institute of Cognitive Neurology and Dementia Research, Otto-von-Guericke University, Magdeburg, Germany. [2] German Center for Neurodegenerative Diseases (DZNE), Magdeburg, Germany.

Evidence suggests that physical fitness can influence cognition such as working memory and attention. Furthermore, these cognitive benefits can be reflected by frequency-specific power changes. The present study assesses the relationship between a 4-month exercise intervention and modulation of neural oscillations within the visual WM network. Electroencephalographic data was acquired during a delayed match to sample (DMS) task at the beginning and end of the intervention. Event related spectral perturbation values for theta band during encoding and recognition sections of the DMS task indicated a positive correlation with fitness at central and posterior electrodes. Our findings suggest cardiovascular training may benefit cognitive processes as indicated by an increase in theta, which is associative with memory performance.

**A-0939 Neural correlate of memory improvement during physical exercise**

Amir-Homayoun Javadi [1], Fadi Ifram [2], Lucile Boccara [2]
[1] School of Psychology, University of Kent, UK [2] Institute of Behavioural Neuroscience, University College London, UK

It has been shown that physical exercise is beneficial for cognition, however, the neuronal mechanism underpinning this process is not yet clear. Therefore, we investigated the correlation of brain activity during physical exercise with memory performance. Eighteen participants were asked to memorise a set of stimuli. Subsequently they either cycled on an exercise bike for 30 minutes while their EEG was recorded, or sat on the exercise bike and watched a documentary for 30 minutes. After a 1.5 hour retention interval, they were asked to perform an old/new recognition task. In addition to improvement in memory performance (exercise 71.11% vs. rest 66.67%, p=0.02), the theta band activity of the DLPFC was correlated with the enhanced performance (r=-0.48, p=0.04).

**A-0942 Characteristics and Functions of Self-Defining Memories in Anorexia Nervosa Patients**

Bilge Göz, Ali Tekcan
Boğaziçi University, İstanbul, Turkey

The present study investigated functions and characteristics of self-defining memories (SDM) in individuals diagnosed with anorexia nervosa (AN) compared to control participants. All participants provided three self-defining memories and filled out the Thinking About Life Experiences Scale, the Beck Depression Inventory, and the Toronto Alexithymia Scale (TAS). SDMs were analyzed in terms of specificity, content, meaning making as well as the function(s) they serve.

**A-0947 Eight-year-olds' attributions of the origins of self-generated knowledge**

Jessica A. Dugan, Patricia J. Bauer
Emory University, Atlanta, USA

The present research investigated eight-year-olds' memory for the context of newly self-generated knowledge. Children heard pairs of story passages presenting novel facts that could be integrated to self-generate new factual knowledge. One week later, children identified where they learned each self-generated fact from a set of choices. Children who attributed their new knowledge to external sources consistently selected the second story in each pair. Critically, the second story was the first opportunity to generate the new knowledge. Behavioral and preliminary eye-tracking data indicate that children are generally uncertain as to the source of their self-generated knowledge but they may be aware, on some level, of the relations between the stories after learning the second fact in each story pair.

**A-0948 Representation of distinct dimensions of episodic retrieval along the hippocampal long-axis**

Tiffany E. Chow, Andrew J. Westphal, Corey D. Ngoy, Jesse Rissman
University of California, Los Angeles

When viewing photographs of real-world events, a number of mnemonic attributes can be simultaneously evoked depending on whether the depicted event is from one's own life, whether the photographs are familiar or are being viewed for the first time, and whether the event details are unfolding in their veridical sequence. We conducted an fMRI study to assess hippocampal sensitivity to these three dimensions of memory retrieval, using wearable cameras to capture photographs from the lives of 18 participants. Our findings revealed dissociable coding along the hippocampal long-axis, such that posterior regions showed sensitivity to photographic source (own life vs. other's life), whereas anterior regions were disproportionately sensitive to viewing history (pre-exposed vs. novel) and temporal order (intact vs. scrambled sequences).

**A-0951 Exploring the role of context on the existing evidence for reconsolidation of episodic memory.**

Ana M. Capelo, Pedro B. Albuquerque, Sara Cadavid
University of Minho, Braga, Portugal

Recent animal research has revealed that when a consolidated memory is reactivated it becomes in a state of vulnerability that traditionally characterize newly formed memories. Hupbach and collaborators (2007), developed a 3-day object-learning paradigm which showed that episodic memory is highly susceptible to interfering material presented after its reactivation. Later studies on this paradigm shed light on the components that elicit memory reactivation. Encoding original and new information in the same context is both necessary and sufficient for the update effect to be observed. The present experiment aims to explore one topic that these studies have systematically overlooked: the role of retrieval context. This manipulation seems crucial to interpret the result as evidence for reconsolidation of human episodic memory.

**A-0958 Updating object representations in memory: A comparison between adults and children**

Wen-Chi Chiang, Yu-fen Lo
National Chung Cheng University, Chiayi, Taiwan

Numerous studies have suggested that spatiotemporal cues are prioritized over surface features in updating object representations in memory. The evidence can be found in both human adults and preverbal infants, despite that the measures used were critically different. The current experiments tested and compared adults and preschoolers in their explicit verbal judgments regarding the numbers, identities, and intrinsic properties of objects from different categories in a set of visual events, and focused on how self-initiated versus other-initiated motions sequentially seen in each event were used for updating object representations. The results showed that, similar to adults, preschoolers predominantly relied on spatiotemporal cues, and furthermore, they relied heavily on the surface features over motional cues when the spatiotemporal cues were ambiguous.

**A-0959 Effects of priming on encoding and retrieval of visual events**

Anett Rago, David Szabolcsi, Bence Szekeres-Gaal
University of Eotvos Lorand, Budapest

Based on Schank's dynamic memory theory we tried to activate participants' TOPs, and therefore influence the retrieval of their event memories. By reediting different movie trailers we created novel events that were incoherent (with incomprehensible story line). We also manipulated the mode of schema activation by either naming the trailer's genre (labeling) or presenting priming stimulus beforehand. In the control condition no schema was activated. We measured retrieval by rating the coherence of narratives given by the participants. Results show the priming group's stories were significantly less coherent than those of both the label and the control groups. Also the label group performed significantly better than the other two groups in recollection of the presented stimuli.

**A-0992 Role of the Posterior Parietal Cortex in Episodic Retrieval**

Marty Fiati, Peter Bright
Anglia Ruskin

Memory research findings increasingly implicate the posterior parietal cortex (PPC) in the memory operations which occur at the time of episodic retrieval. In order to evaluate the causal relationship of this activity with retrieval, transcranial direct current stimulation (tDCS), was employed before participants performed a multisensory episodic retrieval task. The performance of 30 participants on the task following anodal tDCS or cathodal tDCS, as well as sham tDCS was compared. Anodal stimulation was not found to lead to improved performance over sham stimulation on the retrieval task overall, however cathodal stimulation was found to reduce performance compared to sham stimulation. The findings indicate reductions in PPC activation may decrease successful retrieval of different sensory features of an episode.

**A-1056 Reconsolidation cuts both ways: reactivation selectively strengthens, but does not disrupt, memory for threatening events.**

Marijn CW Kroes [1,2], Joseph E Dunsmoor [1], Qi Lin [1], Elizabeth A Phelps [1,2,3]
() Department of Psychology [2] Center for Neural Science, New York University, New York, NY 10003; [3] Nathan Kline Institute, Orangeburg, NY 10962, United States of America

Consolidated memories are classically viewed to be stable and remain essentially unchanged. Reconsolidation research challanges this view by demonstrating that reactivating consolidated memories can renew flexibility. The vast majority of evidence for reconsolidation comes from studies with laboratory animals that use Pavlovian conditioning tasks. Evidence for reconsolidation of other types of memory, especially episodic memories is limited, and the natural function of reconsolidation is unclear. In this study we found that reactivation resulted in a selective retrograde and anterograde strengthening of episodic memory for stimuli associated with an aversive Pavlovian learning experience. We thus provide supporting evidence for reconsolidation of episodic memory in humans and suggests that its allows selective strengthening of relevant episodic memories.

**A-1075 Working Memory Differences in Collaborative Remembering: Group Ability versus Group Discrepancy**

Nikolas S. Williams, Celia B. Harris, Amanda J. Barnier
Macquarie University, Sydney, Australia

Collaborative inhibition is a robust finding whereby groups recalling together remember less than the sum of individuals recalling alone. Though well researched, less attention has been paid to the distinct cognitive abilities of group members and how differences in their abilities might affect both collaborative memory performance and post-collaborative individual performance. In two studies we examined how average working memory capacity within groups influenced collaborative and later individual recall. In particular, we examined how discrepancies between members' abilities impacted group and individual memory performance. Across both experiments we found evidence that the discrepancy between collaborators' working memory abilities, and not individual or average group ability, affected performance at both the individual (Experiment 1) and group (Experiment 2) level.

**A-1077 Frequency-dependent brain regional homogeneity alterations in patients with mild cognitive impairment during working memory state relative to resting state**

Pengyun Wang [1], Rui Li [1], Jing Yu [2], Zirui Huang [3], Juan Li [1]
[1] Center on Aging Psychology, Key Laboratory of Mental Health, Institute of Psychology, Chinese Academy of Sciences, Beijing, 100101, China; [2] Faculty of Psychology, Southwest University, Chongqing, China; [3] Institute of Mental Health Research, University of Ottawa, Ottawa, Canada

Using the index of regional homogeneity (ReHo), this study explored brain network impairments in mild cognitive impairment (MCI) during a working memory task relative to the resting state. ReHo is altered in several regions in the slow-3 band (0.073–0.198 Hz) and the slow-5 band (0.01–0.027 Hz) in MCI. Furthermore, in normal controls, the value of ReHo in clusters belonging to the default mode network decreased, while the value of ReHo in clusters belonging to the attentional network increased during the task state. However, this pattern was reversed in MCI, and was associated with decreased working memory performance. In addition, we identified altered functional connectivity of the abovementioned regions with other parts of the brain in MCI patients.

**A-0066 Development and Evaluation of Efficacy of a Virtual Interactive Memory-Training Program for Older Adults With Mild Cognitive Impairment: A Randomized Controlled Study**

Kuei-Ru Chou
School of Nursing, College of Nursing, Taipei Medical University, Taipei, Taiwan

This study developed protocols of memory-training programs to improve memory performance, memory complaints, and depression in older adults with mild cognitive impairment. This double-blind, randomized controlled study with a 2-arm parallel group design. Participants were randomized by permuted-block randomization into an intervention (virtual interactive memory training [VIMT]) and an active control (passive information activities [PIA]) group. The VIMT group participants underwent training with initial and booster training sessions. Both initial training and booster training (36 sessions each) included training sessions of 45 minutes per day and 3 sessions per week for 12 weeks. Latent growth curve modeling was used in the repeated-measures analysis to estimate the causal effects of the intervention and to control the latent variables.

**A-0916 Prospective memory following Traumatic Brain Injury**

Emmanuel Sarku, Judi Ellis, Arpita Bose
University of Reading

Prospective memory (PM) - memory for future intentions - is important for independent living. Previous research reports that people with traumatic brain injury (TBI) have difficulties with PM but few used assessments that closely represent everyday PM.Moreover, none investigated the benefits of encoding manipulations on PM performance in TBI (e.g., verbal versus enactment). The Virtual Week PM task was administered to 30 TBI participants and 30 demographically matched controls that enacted or verbally encoded PM tasks. Result indicate that PM performance is higher after enactment compared to verbal encoding, for both TBI patients and healthy matched controls, in event-based but not time-based tasks. These findings have implications for the successful rehabilitation of PM impairment in people with TBI.

**A-0598 Material-specific impairment to face memory in a case study of focal right perirhinal cortex damage**

E. E. Butler, C. Loane, A. Roca-Fernandez, C. Butler
Memory Research Group, Nuffield Department of Clinical Neurosciences, University of Oxford, Oxford, UK.

It is well established that medial temporal lobe (MTL) structures, including hippocampus and perirhinal cortex (PrC), support long-term memory. Less well established is the segregation of MTL structures in terms of process- and material-specificity. In a rare case study, a 48-year-old male with focal damage to right PrC following a cerebral abscess demonstrated normal performance on a range of standard neuropsychological tests. However, a specific deficit was detected in recognition memory for faces, compared with scenes and words. Performance on the Cambridge Face Perception Task was unimpaired. These results support material-specificity within MTL structures, but leave open the question of process-specificity. Ongoing experiments test for a material-specific dissociation between familiarity and recollection processes in right PrC.

**A-0955 Sports-specific Experiences Influence Manual Skill Learning in A Force Field**

Erik Chang, Liang-Wei Kuo
Institute of Cognitive Neuroscience, National Central University, Taoyuan City, Taiwan

The current study aims to examine how table tennis players, practitioners of Taichi pushing hand, and an age-matched control group differ in their ability to control manual movement along a novel figure-of-eight path. The participants perform the movement for eight cycles either with and without the force field in different sessions. The results showed that both sport groups outperformed the control by having lower variation in their trajectories, and the Taichi group showed further advantage in bringing their movement trajectory back to the predesignated path when in situations when outrageous deviations occurred. We conclude that long-term practice of sensing and fast reacting to unexpected patterns of external force may allow one better prepared to learn novel motor skills.

**A-0013 Talking about the personal past versus future in everyday life: A naturalistic observation study**

Burcu Demiray Batur, Mike Martin
University of Zurich Psychology Department Zurich, Switzerland

We examined how much, how and why older adults talk about their autobiographical memories versus their future in everyday life. We used the Electronically Activated Recorder (EAR; portable audio recorder that periodically records snippets of ambient sounds and speech). Forty adults (above age 60) used the iEAR app for four consecutive days. Recording occurred every 15 minutes for 30 seconds. Participants´ utterances have been coded in terms of temporal focus (past, future, present), emotional valence and function (self, social, directive). Preliminary analyses showed that participants talked about their past twice as much as their future. Further analyses will compare past- and future-related utterances in terms of valence and functions. Findings will be discussed in terms of autobiographical memory and aging.

# Neuroscience of memory III

**I121 session**

Thursday, 21 July 2016 | 13:00 - 15:00 | Room 1

**Chair/Organizer: Lucy Cheke**

**A-0014 Neurocognitive investigation of Memory in Obesity**

Lucy Cheke, Heidi Bonnici, Nicky Clayton, Jon Simons
Department of Psychology, University of Cambridge, Cambridge, UK

Obesity has become an international health crisis. Accumulating evidence suggests that excess bodyweight may be associated with brain abnormalities and cognitive deficits. In particular, research suggests that obesity is associated with hippocampal and frontal dysfunction, suggesting an impact on episodic memory function. Here we present two experiments. In the first, young, otherwise healthy overweight individuals were found to be impaired relative to controls on an episodic memory task. In a follow-up fMRI study, key areas of the core recollection network showed significantly reduced activity during performance of the memory test in obese participants relative to lean controls. Analysis of blood samples revealed that some, but not all, variance in brain activity was significantly predicted by fasting plasma insulin levels.

**A-0234 Large-scale Dynamics of the Episodic Memory Network Shape Memory Accuracy**

Anne-Lise Saive, David Meunier, Samuel Garcia, Marc Thévenet, Jean-Pierre Royet, Jane Plailly
Olfaction: from coding to memory team, Lyon Neuroscience Research Center, CNRS UMR 5292 - INSERM U1028 - University Lyon1, Lyon, France

The ability to remember past events is a reconstructive process that results in distorted or inaccurate memories in most cases. We coupled a novel ecological laboratory approach with modular decomposition analyses of fMRI data to reveal whole-brain accuracy-specific neural interactions during the retrieval of complex and multimodal events. Compared with inaccurate episodic retrieval, accurate episodic retrieval was characterized by modification of the architecture of the network, which was more strongly interconnected and composed of more independent modules. More precisely, memory accuracy was characterized by enhanced functional interactions between sensory, semantic and recollection-sensitive regions. Our study emphasizes distributed and specific interactions as essential to accurate episodic memory retrieval, paving the way for future studies to investigate memory at the whole-brain level.

**A-0237 Development of Relational Memory in Middle Childhood: Evidence from Eye Movements**

Yating Liu, Caron Clark, Jamie Edgin
University of Arizona, Tucson, US

Relational memory refers to memory for arbitrary associations among components of experience, and is thought to be critically dependent on the hippocampus. We used eye tracking to examine whether relational binding continues developing during middle childhood. 7-8 year olds (n= 30) and young adults (n= 30) learned face-scene pairings and later selected the matching face from three familiar ones based on a scene cue. Along with higher identification accuracy, adults showed an earlier looking preference towards correctly identified faces (250-500ms) as compared to children (500-750ms). Although both groups didn't demonstrate implicit preferential viewing towards the matching face on incorrect trials, eye movements revealed that children were more resolute in their choices regardless of accuracy.

**A-0262 Differences in the brain oscillatory expression of working memory processes in patients with predominantly negative or positive symptomatic schizophrenia and healthy controls**

Barbara Berger [1], Tamas Minarik [1], Birgit Griesmayr [2], Paul Sauseng [1]
[1] Ludwig-Maximilians University, Munich, Germany [2] University of Salzburg, Salzburg, Austria

Working memory and executive functioning deficits are core characteristics of patients with schizophrenia. Other symptomatologies of the disorder include hallucinations and anhedonia and can grossly be divided into positive and negative symptoms. We examined patients with predominantly negative symptomatology, predominantly positive symptomatology and healthy controls during a visuospatial working memory task with varying executive demand. We found that even in the absence of performance differences EEG oscillatory coupling measures of long-range connectivity between frontal and parietal regions can distinguish between patients and healthy controls (dysconnectivity). Importantly, changes in memory processing expressed by aberrant theta and gamma band activity locally in task-relevant cortical regions can differentiate between the two patient groups; and might represent not only deficits but also compensatory mechanisms.

**A-0307 ERP measures of retrieval orientations predict episodic retrieval accuracy**

Jane E. Herron, Lisa H. Evans
Cardiff University Brain Research Imaging Centre (CUBRIC), School of Psychology, Cardiff University

Previous work has shown that frontal ERPs diverge when participants prepare to retrieve different types of episodic information. These divergences are thought to reflect retrieval orientations, tonically maintained sets which facilitate the retrieval of task-relevant information. Here, we present evidence that ERP correlates of retrieval orientations predict episodic retrieval accuracy. Participants were cued to retrieve either screen location or encoding task. Memory accuracy was equivalent for the two tasks. Neural correlates of retrieval orientations were obtained by contrasting brain activity elicited by the preparatory cues signalling onset of the different episodic tasks. These divergences were evident prior to correct memory judgments only, and took the form of a sustained frontal positivity (700-1900ms) for cues requiring the retrieval of encoding operations.

**A-0341 An fMRI investigation of the neural substrates supporting retrieval of time and context**

Bjorn M. Persson [1], James A. Ainge [1], Ian Cavin [2], Akira R. O'Connor [1]
[1] University of St Andrews, UK; [2] Ninewells Hospital and Medical School, Dundee, UK

Two potential information sources used to disambiguate events in memory are time and context. Results from a human behavioural virtual environment study show that context can be remembered accurately only when recollected, while temporal information can be retrieved using either recollection or familiarity. In a follow-up neuroimaging study, participants underwent fMRI scanning whilst encoding a sequence of videos showing objects in different contexts, based on the virtual environment task. At test participants retrieved item, context (source), or time (source) information, with whole-brain BOLD responses subject to a series of contrasts to differentiate the neural substrates supporting retrieval of the different categories of source information. Results are discussed with reference to the dual-process memory framework and what-where-when/which models of animal memory.

**A-0389 Automated segmentation of the human hippocampus along its longitudinal axis**

G. Lerma-Usabiaga[1], J.E. Iglesias [1], R. Insausti [2], D. Greve [3], P.M. Paz-Alonso [1]

[1] BCBL. Basque Center on Cognition, Brain and Language, Donostia-San Sebastián, Spain; [2] University of Castilla-La Mancha, Department of Health Sciences and Regional Center for Biomedical Research, Human Neuroanatomy Laboratory, School of Medicine, Albacete, Spain; [3] Massachusetts General Hospital and Harvard Medical School, Athinoula A. Martinos Center for Biomedical Imaging, Charlestown, MA, USA

Recent neuroimaging research has started to evince differences in function and structure along the longitudinal axis of the human hippocampus. However, current hippocampal segmentation conventions present two main sources of variability related to 1) manual rotation corrections of the in-scanner head position and 2) the visual selection of the segmenting planes along hippocampal longitudinal axis. Here we characterize the variability associated with these manual operations and propose and test automated solutions based on principal component analysis for rotation, and anterior-posterior hippocampal segmentation. Results revealed that these automated rotation and segmentation methods successfully removed the variability associated to manual operations, which consequently led to a significant increase in the statistical power to detect known effects and the reproducibility of the results.

# Systems interactions in memory

**S0021 session**

Thursday, 21 July 2016 | 13:00 - 15:00 | Room 2

**Chair/Organizer: Steffen Gais, Monika Schönauer**

**A-1031 Interaction between the Hippocampus and the Striatum during Motor Memory Consolidation**

Geneviève Albouy

Movement Control and Neuroplasticity Research Group, Kinesiology Department, KU Leuven, Leuven, Belgium

It is now well accepted that memory systems - traditionally considered to be independent - are not fully segregated but rather interact. Accordingly, in the motor domain, there is increasing evidence that both the striatum and the hippocampus play a crucial role in the learning process. In this presentation, I will review human neuroimaging studies demonstrating that distinct functional interactions between the hippocampus and the striatum differentially contribute to motor memory formation and consolidation. I will present recent results offering insights into the respective roles of these structures in procedural memory consolidation processes. Altogether the results I will be present should open a great window for a more integrative exploration of the neurophysiological mechanisms underlying memory-related cerebral plasticity.

**A-1036 Functional interactions between the hippocampus and nucleus accumbens: Gating associative memories.**

Aaron Mattfeld [1], Craig Stark [2]

[1] Florida International University, Miami, Florida, USA; [2] University of California, Irvine, California, USA

The learning of arbitrary visual motor associations is dependent on a network of regions including the hippocampus, striatum, prefrontal, and premotor cortices. We present data that suggests the hippocampus and striatum do not operate independently but rather interact during the course of learning. Functional connectivity between the hippocampus and nucleus accumbens increased during learning and subsequently subsided once associations are well learned. These interactions may serve to gate associative memories into affective and motor circuits to guide responses and aid in their long-term retention.

**A-1028 Sleep integrates representations across multiple memory systems**

Monika Schönauer [1,2], Florian Pargent [2], Jana Wörsching [2,3], Michael Czisch [3], Steffen Gais [1,2]

[1] Eberhard Karls Universität Tübingen, Germany; [2] LMU München, Germany; [3] Max Planck Institute of Psychiatry München, Germany

Beyond strengthening, sleep may change the quality of memories. Here, we show that sleep integrates explicit and implicit aspects of classification memory and modifies the structure of memory representations. After sleep, the hippocampus, usually linked to explicit memory, contributes to implicit memory recall, whereas the striatum, believed to govern implicit responses, contributes to explicit recollection. Moreover, behavioural measures show cooperation: correlations between explicit and implicit performance measures turn from negative to positive after sleep. When both types of memory can be used collaboratively, performance improves and functional connectivity between the hippocampus and striatum is increased after sleep compared to wakefulness. Thus, sleep combines information learned via different routes into an integral structure and allows to respond optimally to everyday contingencies.

**A-1030 Stress-induced modulation of multiple memory systems**

Lars Schwabe

University of Hamburg, Germany

Stress is a major modulator of memory. While most studies focused on stress-induced changes within a single (mainly hippocampus-dependent) memory system, accumulating evidence indicates that stress may also modulate the engagement of multiple, anatomically and functionally distinct memory systems. In this talk, I will present recent data demonstrating a stress-induced shift from hippocampus-based ‘cognitive’ to dorsal striatum-based ‘habitual’ control of memory. This stress-induced bias towards simple but rigid striatum-dependent memory can rescue performance under stress. In the long run, however, the aberrant engagement of ‘habit’ memory may, in vulnerable individuals, be a risk factor for psychopathology.

**A-1035 What factors influence hippocampal-prefrontal interactions to optimize memory consolidation?**

Kinga Igloi

Basic Neuroscience Department, University of Geneva, Geneva, Switzerland; Centre Interfacultaire de Neurosciences Affectives, University of Geneva, Geneva, Switzerland

Daily lifestyle factors like sleep and regular physical exercise have been shown to benefit memory functions. Yet how we could optimize consolidation of important elements in our memories remains largely unknown. Here we first show that post-learning sleep favors the selectivity of long-term consolidation by retaining the most important (i.e. rewarded) memories, an effect depending on the functional interplay between dopaminergic reward regions, the prefrontal cortex and the hippocampus in fMRI. Next we show that a single physical exercise session enhances associative memory performance. Memory improvement correlates with deactivation over prefrontal regions using NIRS during physical exercise, especially for difficult trials. Overall, we suggest that a clever combination of sleep and physical exercise may sharpen the skyline of our memories.

**A-1050 Episodic memories in hippocampus and medial prefrontal cortex**

Christian Doeller

Donders Institute, Radboud University, Nijmegen, the Netherlands

The hippocampus and medial prefrontal cortex (mPFC) are known to be involved in episodic memory, but how do these regions support the formation of mnemonic representations of past events? We used videos of life-like animated events to simulate episodic memory formation. The posterior hippocampus and mPFC showed increased neural similarity between two formerly distinct events once these two events are integrated into a narrative. Such narratives are represented in parallel at different resolutions along the long-axis of the hippocampus when it is necessary to integrate multiple events into more complex narratives. Furthermore, the hippocampus and mPFC can update narratives with newly experienced events, thus these representational networks remain flexible after initial formation.

**A-1046 Reinstating to encode: How prior spatial knowledge impacts learning of new locations**

Marlieke van Kesteren [1,2], Thackery Brown [2], Catherine Escher [2], Anthony Wagner [2]

[1] Faculty of Behavioural and Movement Sciences, section Educational Neuroscience, Institute for Brain and Behaviour, Vrije Universiteit Amsterdam, Amsterdam, the Netherlands; [2] Psychology Department, Stanford University, Stanford, USA

Memories are often linked through interconnected representations of our experiences and knowledge. When new information is encoded it is often processed as related to pre-existing knowledge structures (or schemas). Reinstatement of these knowledge structures is proposed to aid integration of new information. However, the exact processes underlying this integration through reinstatement are still unknown. Here, we used a navigation paradigm in which participants were first overtrained on face locations in multiple rooms that were distinguishable by disparate wallpapers. Subsequently, in the MR-scanner, participants learned new goal locations in the same rooms. We will discuss our findings pertaining to whether the extent of reinstatement of previously acquired knowledge (i.e. the related faces) during new learning affects encoding success of new locations.

# Ageing and neuropsychology of memory I

**I151 session**

Thursday, 21 July 2016 | 13:00 - 15:15 | Room 3

**Chair/Organizer: Nathan S. Rose**

**A-0545 Neural correlates of verbal and nonverbal memory for item and item-location: Evidence from the dementias**

Marshall Dalton [1,2,3], Michael Hornberger [2,4], John R Hodges [1,2,5], Olivier Piguet [1,2,5]

[1] Neuroscience Research Australia, Sydney,Australia; [2] ARC Centre of Excellence in Cognition and its Disorders, Sydney, Australia; University College London, UK; [4] University of East Anglia, Norwich, UK; [5] University of New South Wales, Sydney, Australia

This study investigated associative memory for verbal and nonverbal material and its relations to MTL integrity in Alzheimer's disease (AD) and semantic dementia (SD). With their differential patterns of MTL atrophy (AD: hippocampus; SD: perirhinal cortex), these disorders offer a unique clinical lesion model to study the specific contributions of MTL structures to associative memory. VBM analyses showed the right perirhinal cortex to be related to item-item nonverbal memory and the left perirhinal cortex and hippocampus to be associated with memory for compound words. Verbal and nonverbal item-location recognition memory was associated with left, respectively right, posterior hippocampus and parahippocampal cortex integrity. These findings demonstrate the asymmetric involvement of left and right MTL during verbal and nonverbal mnemonic processes respectively.

**A-0071 Multiple routes from memory to decision making (and age-related effects)**

Fabio Del Missier [1,2], Patrik Hansson [3], Valentina Coni [2], Timo Mäntylä [1]

[1] Stockholm University; [2] University of Trieste; [3] Umeå University

We present two individual-differences investigations, carried out with the aim of identifying the memory correlates of decision-making skills. The investigations were carried out on population-based Swedish samples between 25 and 80 years of age (n > 500). Study 1 showed selective relations between memory processes (i.e., semantic, episodic, and working memory) and diverse aspects of decision-making competence as measured with the A-DMC battery. The age-related declines observed in the more cognitively-demanding decision-making tasks were mediated by the age-related differences in working memory or episodic memory. Study 2 confirmed the findings even when controlling for the influence of processing speed and sensory functioning. Overall, the results showed that different memory processes fulfill different functional roles in diverse judgment and decision-making tasks.

**A-0156 McCusker Subjective Cognitive Decline Inventory- Development of a New Measure**

Hamid R Sohrabi [1,2,3], Michael Weinborn [2,3], Kaikai Shen [3], Ralph N Martins [1,2,3]

[1] Edith Cowan University, Joondalup, Western Australia, Australia; [2] University of Western Australia, Crawley, Western Australia, Australia; [3] McCusker Alzheimer's Research Foundation, Nedlands, Western Australia, Australia

Subjective Cognitive Decline (SCD) refers to self-reported changes people have noticed or experienced in their cognitive functioning. The SCD is a precursor to mild cognitive impairment and dementia. However, there is a paucity of highly sensitive and specific measures. Here, we report on the development of a new measure, namely the McCusker Subjective Cognitive Decline Inventory (McSCI). The McSCI measures current cognitive functioning compared to last two years and has two forms, self and other-reports. Data for 600 participants aged 40-89 years old are presented and the reliability and validity of the McSCI against other measures will be discussed. Our data indicates that McSCI is a reliable and valid measure of SCD.

**A-0313 When the extended hippocampal system is of no need for context-free memory: a case of developmental amnesia**

PY Jonin [1,2,3], G. Besson [1], J Pariente [4], R. La Joie [5], S. Belliard [3,5], C. Barillot [2], EJ Barbeau [1]

[1]Centre de Recherche Cerveau et Cognition, CNRS, CerCo, UMR 5549, Toulouse, France [2]Inria, VISAGES Project-Team, Université de Rennes 1, INSERM, U746, CNRS, IRISA, UMR 6074, Rennes, France [3]CHU Pontchaillou, Service de Neurologie, Rennes, France [4]Inserm U825, Université Paul Sabatier, Toulouse, France [5]Inserm U1077, Université de Caen Basse Normandie, UMR-S1077, Ecole Pratique des Hautes Etudes, UMR-S1077, CHU Caen, Caen, France

Whether and how declarative memory can be subdivided in different functional systems is still unclear. Lesion studies mainly focus on subhippocampal structures and hippocampus rather than considering other components of the extended hippocampal system. We describe the case of KA, a 27 years-old man who suffered from severe hypoxia at birth. Despite a typical pattern of severe amnesia, KA presented with normal to supra-normal recognition memory, even under strong temporal constraints, and normal to supra-normal semantic knowledge. Multimodal neuroimaging revealed selective atrophy of all components of the extended hippocampal system, contrasting with preservation of anterior subhippocampal cortices. We thus report the first case of supra-normal semantic knowledge in severe amnesia, raising important questions about how such knowledge has been acquired.

**A-0400 Time-based prospective memory in children with traumatic brain injury: Impact of working memory demands.**

Natalie Lynette Phillips [1], David Shum [2], Anna Mandalis [3], Louise Parry [3], Suzanne Benson [4], Angie Morrow [4], Adrienne Epps [3], Suncica Lah [1]

[1] The University of Sydney, Sydney, Australia; [2] Griffith University, Gold Coast, Australia; [3] Sydney Children's Hospital, Sydney, Australia; [4] The Children's Hospital at Westmead, Sydney, Australia

Objective: To investigate whether time-based prospective memory (TBPM) is impaired and affected by demands placed on working memory (WM) in children with traumatic brain injury (TBI). Methods: Thirty-nine children (20 TBI, 19 controls) completed a TBPM task with two conditions: low and high WM demand. Results: Compared with controls, children with TBI demonstrated poorer TBPM on both the low and high WM demand conditions. Across groups, TBPM was poorer on the high compared to the low WM demand condition. Conclusions: TBPM is impaired following pediatric TBI, irrespective of the level of WM demand. Our findings suggest that children with TBI may be at risk of failing to perform future intentions at the right time in daily life.

**A-0567 Remote spatial and autobiographical memory in people with medial or posterior temporal lobe damage**

Jessica Robin [1,2], Josée Rivest [3,4], R. Shayna Rosenbaum [2,5], Morris Moscovitch [1,2,3]

[1] University of Toronto, Canada; [2] Rotman Research Institute, Baycrest Hospital, Toronto, Canada; [3] Psychology Department, Baycrest Hospital, Toronto, Canada; [4] Glendon College, York University, Toronto, Canada; [5] York University, Toronto Canada

The hippocampus has been associated with spatial and episodic memory, though its role in remote memory of both types is still debated. We

studied remote spatial and autobiographical memory in individuals with amnesia relating to medial temporal lobe (MTL) damage, including the hippocampus, and an individual with topographical disorientation (TD) relating to posterior temporal lobe damage. Compared to controls, all had impaired memory for details of spatial scenes, but only amnesic individuals demonstrated autobiographical memory impairment. No one was impaired at judging coarse spatial relationships, indicating that schematic spatial memories are spared following MTL and posterior temporal damage. The results suggest that the MTL supports detail-rich spatial and autobiographical memories, with the posterior temporal cortex additionally contributing to spatial memories.

**A-0593 Decoding the Content of Thought in Younger and Older Adults during Remembering and Imagining**

Nathan S. Rose [1,2], Karl K. Szpunar [3,4], Peter Goodin [1], Peter G. Rendell [1], Daniel L. Schacter [4]

[1] Australian Catholic University, Melbourne [2] University of Notre Dame [3] University of Illinois, Chicago [4] Harvard University

Neuroimaging studies have found that simulating future events relies on similar neurocognitive processes as remembering past events, and that both abilities demonstrate similar age-related declines. However, almost all studies have used univariate approaches to fMRI analysis. In this study, younger and older adults either imagined future events or remembered past events on each trial. We used multi-voxel pattern analysis to decode whether participants were imagining the future or remembering the past on each trial based only on their brain activity. Pattern classifiers could decode brain activity that reflected imagining versus remembering early in the trial for younger adults and later in the trial for older adults, suggesting the two are distinguishable and are affected by age-related declines in processing speed.

**A-0760 Does dual-task coordination performance decrease from adults to old people?**

Maria Victoria Sebastian [1], Roberto Mediavilla [2]

[1]Universidad Complutense de Madrid, Spain; [2] Universidad Nacional de Educación a Distancia, Madrid, Spain

The present study examined the changes that occur over the years, from adults to old people, in the capacity to coordinate attention between two simultaneous tasks. 972 volunteer participants ranging from 35 to 90 years old carried out a verbal digit span task, followed by single and concurrent (dual-task) performance of a tracking task and a digit recall task in relation to their memory span. The results showed that the capacity to coordinate attention between two tasks remained constant across adulthood and healthy ageing, even among very old people, as opposed to patients suffering from several types of dementia. The results support the normal functioning of the central executive component of Baddeley's working memory model in old people.

# Forgetting II

**I023 session**
Thursday, 21 July 2016 | 13:00 - 15:00 | Room 4
**Chair/Organizer: Ben Levy**

**A-0698 Fostering Mnemonic Convergence: The Role of Relational Motives and Social Presence In Eliciting Socially Shared Retrieval-Induced Forgetting**
Martin M. Fagin, William Hirst
The New School for Social Research
The role of relational motives and social presence on the ability of collaborative remembering to induce forgetting was investigated. In Experiment 1, participants received a communication in text format, with or without a photograph of the communicator. In Experiment 2, participants received a similar communication as an audio-recording, again with or without a photograph, or as a video. In Experiment 3, participants received an audio communication told in the first- or third-person. Experiment 4 replicated the findings of Experiment 1. Results showed that relational motives elicited socially shared retrieval-induced forgetting in listeners only when the social presence of the communicator was established. The formation of collective memory and social identity is discussed.

**A-0779 Retrieval-induced forgetting in the Real World: Towards an end of day review for memory augmentation**
Geoff Ward, Caterina Cinel, Cathleen Cortis
University of Essex
We examined whether images captured through smartphone technology could be used to provide selective review of episodic memories to enable memory augmentation. In Experiment 1, 80 participants were given a campus tour that identified 6 objects in each of 8 experimental locations. Following selective review of images from half of the objects from half of the locations, we obtained significant retrieval practice and retrieval-induced forgetting (RIF), a finding replicated in Experiment 2, when participants chose their own objects from experimenter-controlled categories. In Experiment 3, the magnitudes of retrieval practice and RIF were manipulated by varying the frequency and the number of exemplars practiced. Finally, the retrieval of specific details during practice was critical for obtaining RIF.

**A-0787 Neural Substrates Underlying Intentional Forgetting: a Simultaneous EEG-fMRI Study**
Xu Lei [1,2], Yulin Wang [1,2], Michael C Anderson [3,4]
[1] Key Laboratory of Cognition and Personality (Ministry of Education), Chongqing 400715, China; [2] School of Psychology, Southwest University, Chongqing 400715, China; [3] MRC Cognition and Brain Sciences Unit, Cambridge, UK; [4] Behavioural and Clinical Neurosciences Institute, Cambridge, UK
Although the role of inhibitory control in motivated forgetting has been investigated separately in EEG and fMRI, few multimodal results address how inhibition markers observed with these methods are coupled. We investigated motivated forgetting in 24 adults using a Think/No-Think task with simultaneous EEG-fMRI recording. Separate fMRI and ERP analyses revealed greater activation in the right dorsolateral prefrontal cortex, middle frontal gyrus (MFG) and inferior frontal gyrus (IFG) as well as increased N2 amplitudes during No-Think trials, as in past work. Combined analysis revealed that higher N2 amplitude correlated with reduced activity in MFG and IFG. The EEG-fMRI results resolve localizations of N2 activations and indicate a general role for allocation of attentional resources and inhibition for N2.

**A-0848 Is it ageing that I can not stop not to think?**
Asheek Mohammad Shimul, Jinat Fouzia
University of Dhaka, Bangladesh
The current study attempted to determine whether ageing can affect a persons' ability to actively avoiding thoughts. Emotionally neutral word pairs in the context of Bangladeshi culture were used. It was hypothesized that younger adults would recall no-think words more than the older adults. To investigate this hypothesis, the present with-in subjects experiment allowed for 59 subjects to respond in the standard TNT (Think-No-Think) paradigm. Results clearly shows significant age differences [t(57)= 3.795, p
**A-0850 Memory suppression and its influence on emotional valence of memory**
Yoshiko Honma[1], Jun Kawaguchi[2]
[1] Shinshu University, Japan; [2] Nagoya University, Japan
Previous work on memory suppression has found that suppressing retrieval of unwanted memory leads to less performance of recall afterwards. Emotional attributes may be also modified by memory suppression even though people remember suppressed memory itself. In order to examine the influence of memory suppression on emotional attributes, we used Think/ No-Think paradigm. Participants were asked to memorize word-picture pairs. Pictures had either neutral or negative valence. Then, they were given a cued word and required to remember a paired picture (Think) or not to think about the picture (No-Think), followed by final cued recall and evaluation of emotional valence. The results showed that intentional forgetting influenced emotional valence of memory as well as cued recall performance.

**A-0940 Exploring cholinergic and psychological mechanisms underlying Retrieval Induced Forgetting in individuals with schizophrenia**
Trudi Edginton [1], Fiorentina Sterkaj [2], David Groome [1], Angela Clow [1], Kevin Morgan [1]
[1] University of Westminster; [2] University of Suffolk
Efficient memory recall relies on successful facilitation of relevant material and the inhibition of competing items. Inhibitory deficits have been associated with memory impairments in a range of clinical disorders including schizophrenia. High rates of smoking have been documented in individuals with schizophrenia that may reflect attempts to self-medicate and improve inhibition. Enhanced inhibition with nicotine has been documented on the Retrieval Induced Forgetting (RIF) paradigm in healthy young smokers. We explored the impact of smoking status, trait mindfulness, rumination and mood on RIF in 34 individuals with schizophrenia and 34 healthy controls. There was a significant reduction in RIF in individuals with schizophrenia, which was positively correlated with smoking status, with a trend towards significance for rumination and mindfulness.

**A-0941 The reliability of retrieval-induced forgetting revisited**
Ben Levy

University of San Francisco

Retrieving a memory can cause forgetting of other related memories, a phenomenon known as retrieval-induced forgetting (Anderson, Bjork, and Bjork, 1994). With considerable evidence to support the existence of retrieval-induced forgetting (e.g., Murayama et al., 2014), there has been growing interest in exploring individual differences in this form of adaptive forgetting. At the same time, however, there is evidence to suggest that these measures have low test-retest reliability (Potts et al., 2012). Here we conducted multiple large sample (n's>100) assessments of the reliability of retrieval-induced forgetting and confirm that these measures have low reliability (r's

# Methodological and statistical advances in autobiographical memory research

**S0019 session**

Thursday, 21 July 2016 | 13:00 - 15:00 | Room 5

**Chair/Organizer: Steve M. J. Janssen, Joseph M. Fitzgerald**

**Discussant: Katinka Dijkstra**

**A-0189 Three methods for examining autobiographical memory retrieval**

Katinka Dijkstra

Erasmus University Rotterdam, the Netherlands

Three different methods for collecting and analysing autobiographical memories are discussed. The first method examines how retrieval time of memories reflects the ease with which these memories are generated based on general prompts (e.g. vivid memories) that cue memory content. The second method assesses the accuracy with which earlier reported memories are retrieved again later based on specific prompts that cue memory content (e.g. where). A third method to examine autobiographical memory retrieval is by using body-based cues (e.g. wave) for memory retrieval that affect both access to the memories as aspects of their content. These methods are exemplified by various empirical studies and linked to theories on grounded cognition from which predictions regarding autobiographical memory retrieval can be derived.

**A-0190 Functions of recalling the past in everyday life: An experience-sampling study focussing on within-person variation**

Burcu Demiray, Mike Martin

University of Zurich, Switzerland

Autobiographical memory research relies mostly on retrospective self-reports, but we used experience-sampling, which involves repeated sampling of the same individuals in natural contexts. We examined how and why people think and talk about their past in everyday life and how these factors (co)vary within individuals. Using a smartphone application, we signaled participants seven random times a day for ten days and asked them what they were thinking or talking about at that moment. Participants rated how much their thoughts or utterances focused on their personal past and the emotional valence and functions of their thoughts or utterances. They also reported their current context (e.g., location, activity). Findings will be discussed in terms of the functional/ecological approach to autobiographical memory.

**A-0191 The application of advanced statistical modelling to self-report data in autobiographical memory**

Joseph M. Fitzgerald [1], Carissa L. Broadridge [2]

[1] Wayne State University, USA; [2] Saint Xavier University, USA

In research into memory functions, participants are generally asked to estimate the frequency at which memory recall serves particular functions. In this paper, African-American and European-American women responded to a lengthy survey that contained existing memory scales as well as new items. These new items were developed to create parallel items that referred to internal and social functions and to include less socially desirable items. Participants responded to the survey twice: memories for positive events and memories for loss experiences. The data are analyzed with a variation on the multimethod-multitrait matrix approach. The focus will be on the consistency of memory functions models. This approach can raise the confidence in the validity of self-report data.

**A-0192 Modelling the lifespan curve of autobiographical memories using non-linear mixed models**

Daniel Zimprich, Tabea Wolf

University of Ulm, Germany

To examine the influence of individual differences on the reminiscence bump, we developed a nonlinear mixed model that links AM frequency to age bins. The model entails three parameters: alpha captures the bump's height, gamma represents the bump's location, and delta captures the age difference between gamma and the point where AM frequency is half of the maximum. All parameters are conceptualized as both fixed and random effects. Eighty elderly participants had to recognize songs from the past. The correlation between alpha and gamma implied that those with a higher bump tended to show this bump at an earlier age. The correlation between gamma and delta suggested that those with a later bump tended to show a broader bump.

**A-0193 Uncovering the reminiscence bump in the distributions of young adults with the RIRRE model**

Steve M. J. Janssen

University of Nottingham - Malaysia Campus, Malaysia

If one compares the distributions of autobiographical memory of two or more samples, one can encounter several practical problems. Some samples might consist of more observations than others. Similarly, some samples might cover longer age ranges than others. Furthermore, for young adults, the reminiscence bump and the recency effect coincide, thus obscuring the former with the latter. To address these three issues, the RIRRE model was developed. The model's workings will be explained with three simulated datasets and one experimental dataset, and its limitations and usage will be discussed. The model was designed for distributions that display an increased recall of recent events, but it can also be used for distributions that do not display such a recency effect.

**A-0194 On the direct retrieval of autobiographical memories: Is it real yet?**

Norman R. Brown [1], Tugba Uzer [2]

[1] University of Alberta, Canada; [2] TED University, Turkey

The intentional retrieval of autobiographical memories is often characterized as being deliberate, effortful, and time-consuming. A recent study, which used RTs in conjunction with concurrent verbal protocols and retrospective strategy reports, demonstrated that: participants frequently retrieve memories within a few seconds of reading a cue; participants often indicate that memories have come "directly to mind"; and RTs are much faster when memories are retrieved directly. This pattern of results has been replicated in several countries, with older adults, and when participants respond with future events. The high prevalence of direct retrieval implies memory representations are, mostly, prestored and the generation process involves the search for a cue or a set of cues capable of triggering one of these memory representations.

# Research on involuntary autobiographical memories: Past, present and future

**S0040 session**
Thursday, 21 July 2016 | 13:00 - 15:00 | Room 6
**Chair/Organizer: Lia Kvavilashvili**
**Discussant: Daniel Schacter**

**A-0329 Involuntary autobiographical memories and their mechanisms**
Dorthe Berntsen
Aarhus University, Aarhus, Denmark
Involuntary autobiographical memories are explicit memories of past events that come to mind spontaneously, with no preceding conscious search, but often in response to distinct situational cues. In contrast to the conventional view that such memories are rare or dysfunctional, more recent evidence shows that they are highly frequent in daily life and mostly positive. Experimental research has demonstrated that their activation is governed by well-known and discernible mechanisms of association. Measures of retrieval time and brain imaging data suggest that they involve less executive processes compared with episodic memories retrieved deliberately. They may be viewed as a 'short-cut' to the personal past with possible implications for our understanding of autobiographical memory in individuals with reduced executive functions.

**A-0330 Why are we not flooded by involuntary autobiographical memories? Evidence for a role of attentional load**
Manila Vannucci [1], Claudia Pelagatti [1], Maciej Hanczakowski [2]
[1] University of Florence, Italy; [2] Cardiff University, UK
Involuntary autobiographical memories (IAMs) are prompted by environmental cues and are more likely to occur during undemanding activities. Given the constant flow of external stimulation and the abundance of time spent in monotonous activities, a question arises of why we are not flooded by IAMs. Recent studies showed that cue overload and cue frequency limit the incidence of IAMs. Here we further addressed this question by investigating the effects of varied attentional load (single feature vs conjunction) associated with the task. Compared to low-load, high-load strongly reduced the amount of IAMs and dramatically slowed down the retrieval processes. Explanations in terms of interference with the process of forming IAMs and/or with participants' awareness of IAMs are discussed.

**A-0331 False involuntary memories**
Giuliana Mazzoni [1], Barbara Pizzini [2], Danila di Foggia [2]
[1] University of Hull, UK; [2] University of Milan, Italy
Involuntary autobiographical memories (IAMs) are memories for personal past events that spontaneously pop in mind during everyday –life activities. No study so far has addressed the question of the accuracy of these memories. Here we examined whether IAMs can be inaccurate by assessing whether they are prone to the misinformation effect. A novel priming procedure was used, in which an event is experienced, misinformation is given, and involuntary memories are later collected about the event. Results of the two experiments reported have shown that involuntary memories are influenced by the misinformation. Theoretical and practical implications of these findings are discussed.

**A-0332 Older adults report twice as frequent future-oriented thoughts and moderately more detailed memories**
Robert S. Gardner [1,2], Matteo Mainetti [1], Giorgio A. Ascoli [1]
[1] George Mason University, Virginia, US; [2] Syracuse University, New York, US
How often do thoughts about past experiences or future events pop into mind and how do they change with age? Do typical older adults reminisce more frequently about the past while younger individuals spend more time in future planning? Using experience sampling to quantify the naturalistic incidence of autobiographical and prospective memories, we identified an age-associated shift in the temporal orientation of recollection, and a strong correlation between the duration of past- and future-oriented thoughts. Furthermore, measuring the number and types of subjectively reported details with an online word-cue instrument (http://www.cramtest.info/), we showed that retrieved content modestly but significantly increased with subjects' age (while decreasing with the episode's age). These studies quantify crucial yet largely unexplored dimensions of episodic memory.

**A-0328 A spontaneous retrieval deficit in older adults with Mild Cognitive Impairment**
Agnieszka Niedźwieńska [1,2], Lia Kvavilashvili [1]
[1] University of Hertfordshire, Hatfield, UK; [2] Jagiellonian University, Krakow, Poland
Mild Cognitive Impairment (MCI) is a transitional state between normal ageing and dementia. We investigated, for the first time, whether MCI individuals differed from healthy older adults on the frequency of involuntary autobiographical memories (IAMs). MCI individuals and healthy older adults were randomly stopped during a vigilance task and recorded their thoughts at that moment. Although the vigilance task was equally undemanding for both groups, MCI individuals reported less spontaneous thoughts. When spontaneous thoughts were categorised as past memories, thoughts about current situation or future events, it was only memories that were experienced significantly less often in MCI. The results suggest that MCI is characterized by considerable reduction in the number of IAMs and hence substantial deficits in spontaneous retrieval.

**A-0333 "The Teddy is inside!": Experimentally induced spontaneous memories in 35- and 46-month-olds**
Peter Krøjgaard, Osman S. Kingo, Toril S. Jensen, Dorthe Berntsen
Aarhus University, Aarhus, Denmark
Although most parents have experienced their preschool child having spontaneous episodic memories, such memories had until recently only been observed outside the lab. We here report experimentally induced spontaneous memories in 35- and 46-month-old children (N=110). At the first visit, half of the children experienced a Teddy event and the other half experienced a Game event. At the second visit the children's spontaneous utterances were recorded while waiting. The results revealed that the children talked spontaneously about the unique event experienced previously. Whereas age showed no systematic effect on spontaneous episodic recollection, there was a clear effect of age on subsequent control questions requiring strategic retrieval. The results support the idea of involuntary episodic remembering developmentally preceding strategic recall.

**A-0334 Involuntary autobiographical memories and mind-pops: A developmental study**
Ruth Ford [1], Lia Kvavilashvili [2]
[1] Anglia Ruskin University, Cambridge, UK; [2] University of Hertfordshire, Hatfield, UK

Involuntary Autobiographical Memories (IAMs) are spontaneous memories of past events, while semantic mind-pops refer to fragments of semantic knowledge (e.g., isolated words, images or songs) that come to mind unexpectedly, often without any triggers. Research has focused primarily on IAMs and mind-pops in adults. Here we report a developmental study in which 5-, 7-, and 9-year-old children and young adults were interviewed about their involuntary memories. Results showed that even 5-year-old children admitted having both IAMs and mind-pops and were able to provide meaningful examples. However, children reported lower frequencies of IAMs and musical mind-pops than young adults. The implications of these findings for research on IAMs and cognitive development will be discussed.

# Developmental changes in memory binding, pattern separation, and pattern completion across the lifespan

**S0012 session**

Thursday, 21 July 2016 | 13:00 - 15:15 | Room 7

**Chair/Organizer: Chi Ngo, Nora Newcombe**

**A-0119 The development of lure discrimination and relational memory in young children and adults**

Chi T. Ngo, Nora S. Newcombe, Ingrid R. Olson

Temple University, Philadelphia, Pennsylvania, USA

Episodic memory relies on memory for the relations among multiple elements of an event and the ability to discriminate among similar episodes. Although research has been done in young and older adults, no previous studies have examined the development of memory discrimination and how it correlates with relational memory in young children. In the current study, 4- and 6- year-olds and young adults performed the Mnemonic Similar Task, designed to tax lure discrimination, and a relational memory task. For both tasks, 4-year-olds performed significantly worse than 6-year-olds and adults, whereas 6-year-olds and adults performed comparably. Lure discrimination and relational memory did not correlate with each other in any age group, suggesting that they may be distinct processes with neural underpinnings.

**A-0179 Trajectories of emergence of pattern completion and pattern separation in early development**

Rebecca Gomez

The University of Arizona

The trisynaptic circuit supporting pattern separation and completion develops slowly, prompting us to test the emergence of these abilities. Children ages 2.5, 3.5, 4.5 and 5.5 years learned to associate members of similar- and distinct-object pairs with distinct owners. They then sorted objects by owner after a 15-minute delay. Given earlier development of CA3 than DG, we predicted better pattern completion than pattern separation at younger ages reflected in greater retention for distinct than for similar object pairs. We predicted emergence of pattern separation in older children who should show equal performance on similar and distinct object pairs.

**A-0139 Forgetting development: Memory binding and interference effects in childhood and beyond**

Kevin P. Darby [1], Vladimir M. Sloutsky [1], Leyre Castro Ruiz [2], Edward A. Wasserman [2]

[1] The Ohio State University; [2] Iowa University

Learning can cause forgetting of information learned previously in what is known as retroactive interference. We have demonstrated that children, but not adults, can be susceptible to catastrophic levels of interference and have hypothesized that the complexity of memory binding structures modulates susceptibility to interference. In the current work, we investigate retroactive interference in adults, children, and pigeons. This cross-species approach suggests that adults are able to spontaneously form complex binding structures, and children are able to do so across time delays. Pigeons, however, do not demonstrate evidence of complex binding in immediate or delayed testing conditions, suggesting important differences in memory binding abilities across ages and species and suggesting important developmental and evolutionary changes in memory.

**A-0125 Neural Basis of Episodic Memory Development: Evidence from Single Nucleotide Polymorphism (SNP) Genotyping**

Hyungwook Yim [1], Simon J. Dennis [2], Christopher W. Bartlett [3], Vladimir M. Slutsky [1]

[1] Department of Psychology, The Ohio State University, USA [2] Department of Psychology, The Univeristy of Newcastle, Australia [3] Department of Pediatrics, The Ohio State Universtiy, Columbus, Ohio, USA

Episodic memory involves a mechanism that binds information into a coherent representation structure. Specifically, more complex memory structures are required when there are more overlapping elements among different episodes. The current study tries to examine the division of labor between the PFC and hippocampus in the formation of different types of binding structure in episodic memory tasks across development. We utilized a multinomial-processing-tree model to dissociate different kinds of binding structures from behavior patterns, and Single Nucleotide Polymorphisms genotyping approach to elucidate the division of labor between different brain areas involved in forming different memory structures. Results indicate that the ability to form complex configural binding structures is mainly subserved by PFC, whereas simpler item-binding structures involve both structures.

**A-0120 Development of Spatial Pattern Separation and Completion: Eye-movements and Hippocampal Volume**

Joshua K. Lee, Simona Ghetti

University of California, Davis

The present study examined the development of spatial pattern separation/completion by assessing eye-movements and hippocampal volumes. Participants (N=146, 7- to 13 year-old children and adults) encoded objects and later identified where objects were presented by choosing between target and lure locations, which were either close or distant in space. Preliminary analyses showed that during the initial 500ms of retrieval, participants looked longer at the eventually chosen target compared to the eventually chosen lure. This difference in looking times was associated with hippocampal volume and depended on the distance between target and lure. Additional analyses will examine age-related effects in these associations. Discussion will focus on processes supporting the development of pattern-separation and completion.

**A-0204 Age-related differences in dentate gyrus volume uniquely linked to improvement in associative memory**

Noa Ofen, Ana Daugherty

Wayne State University, Detroit, USA

Associative memory depends on the integrity of the hippocampus. Because of the complexity of the hippocampus, identifying structure-function relationship across development should include reliable measures of hippocampal subfield volumes, and the subregions along the anterior-posterior axis. Although each aspect has been considered independently, here we evaluate the relative contributions to each as a correlate of age-related improvement in memory. Hippocampal regional volumes were measured in a sample of healthy participants (age 8-25 years) using manual tracing on high-resolution T2-weighted images. Adults had smaller CA3-dentate-gyrus as compared to children, which accounted for better associative memory. In contrast, hippocampus head, body, and tail volumes were age invariant. We conclude that age-related effects in associative memory primarily reflect unique relationship with CA3-dentate-gyrus volume.

**A-0113 Hippocampal contributions to memory integration during childhood and adolescence**

Alison R. Preston
The University of Texas at Austin
Learning and remembering is important across the lifespan, yet little is known about how episodic memory develops. Here, we use high-resolution MRI to relate developmental differences in hippocampal structure to memory integration. Participants aged 6-30 years performed statistical learning and associative inference tasks that require encoding associations across multiple episodes. Structural differences in hippocampal volume were paralleled by performance gains across age on both tasks. We found that smaller hippocampal heads were associated with superior behavioral performance on both tasks. These results suggest that the hippocampal head is important for extracting associative structure from the environment across development. We propose that hippocampal maturation represents a shift away from encoding rigid representations of past experience toward increasingly flexible and generalized memories.

**A-0121 Pattern separation in aging and disease states**

C. Brock Kirwan
Brigham Young University, Provo, UT, USA
Episodic memory involves memory for what happened when and where. Accordingly, effective episodic memory representations must be specific to prevent catastrophic interference between episodes that may overlap in time or place. Computational models suggest that the hippocampus performs pattern separation in order to establish distinct memory representations. Our data demonstrates that the ability to establish distinct, pattern-separated memory representations is critically dependent on hippocampal integrity. This ability seems to depend on intact neurogenesis in the dentate gyrus. This conclusion is supported by findings that memory specificity decreases in normal, healthy aging, is related to volume of CA3/dentate gyrus, and is reduced in major depressive disorder.

# Memory encoding and learning

**I111 session**
Thursday, 21 July 2016 | 13:00 - 15:00 | Room 8
**Chair/Organizer: Kristin E. Flegal**

**A-0451 Generation effect in source memory for actions after enactment**
Nicholas Lange, Timothy J. Hollins, Patric Bach
Plymouth University
Paired participants generated or were provided with action instructions involving two objects from an array, and then either performed the action or observed their partner perform it. A day later, participants were asked to re-enact either the actions they had performed or the actions they had observed (target set). Participants were instructed to enact all actions that came to mind (availability) and to verbally indicate which ideas came from the target set (monitoring). Generating relative to being provided with instructions had limited impact on action availability but led to better monitoring. Participants were more likely to attribute actions they had generated to themselves, and less likely to give them away to their partner, compared to actions provided to them.

**A-0515 PowerpointLESS - implementing more active encoding strategies in lectures to promote recall**
Katie Coria, Philip Higham
University of Southampton
Our previous findings showed that longhand note-taking during lectures leads to enhanced encoding and improved recall. This study investigated what mechanisms within note-taking promote encoding over printed slide annotation. Participants watched a 45-minute lecture in one of six different encoding conditions; observers, annotators, note-takers, verbatim note-takers, condensed note-takers (only summarising the key points) and condensed note-takers with feedback (shown suggested key points after writing their own). We measured immediate and delayed recall, confidence, JOLs and concentration. Preliminary results indicate that, in line with theories including the testing effect, hypercorrection and our previous results, the condensed note-takers (particularly with feedback) outperformed the other groups and in turn longhand note-takers outperformed annotators and controls.

**A-0789 Motor responses modulate episodic memory encoding in humans**
M. Yebra [1], A. Galarza-Vallejo [1], V. Soto-León [2], J. Gonzalez-Rosa [1], A. Oliviero [2], MCW. Kroes [3], B.A. Strange [1,4]
[1] Laboratory for Clinical Neuroscience, CTB. Madrid, Spain [2] Fennsi, Hospital Nacional de Parapléjicos, Toledo, Madrid [3] New York University, New York, NY [4] Fundación Reina Sofía, Madrid, Spain
The assessment of memory requires engagement of the motor system. However, how actions influence memory remains unknown. By crossing incidental memory encoding with a Go/Nogo task we demonstrate that when human subjects make a button-press to a stimulus, encoding is enhanced. Across a series of experiments, remember accuracy for stimuli paired with Go responses is better than for NoGo stimuli. fMRI scanning reveals an interaction between motor response and subsequent memory in an area consistent with locus coeruleus (LC), region functionally coupled with parahippocampal cortex. Recordings of pupil diameter, an indirect measure of LC activity, also reveal an interaction between motor responses and subsequent memory. We conclude that deliberate action can enhance episodic memory encoding via an adrenergic mechanism.

**A-0163 Anticipation measures of sequence learning: manual vs oculomotor versions of the serial reaction time task**
Eli Vakil, Ayala Bloch, Haggar Cohen
Department of Psychology and Multidisciplinary Brain Research Center, Bar-Ilan University, Ramat-Gan, Israel
In an attempt to elucidate the underlying cognitive processes enabling sequence acquisition we compared reaction time (RT) and anticipation in a standard manual activated (MA) to an ocular activated (OA) version of the SRT task. Although overall, RT was faster for the OA group, the rate of sequence learning was similar to that of the MA group. Because the S-R association is automatic in the OA task, the decreased RT reflects a purer measure of the sequence learning. Thus, eye tracking anticipation can serve as a direct measure of sequence learning. Finally, using the OA version of the SRT presents a significant methodological contribution by making sequence learning studies possible among populations that struggle to perform manual responses.

**A-0198 Adaptive task difficulty promotes neural plasticity and transfer of training**
Kristin E. Flegal [1,2], J. Daniel Ragland [3], Charan Ranganath [2,4]
[1] Institute of Neuroscience and Psychology, University of Glasgow, Scotland, UK; [2] Center for Neuroscience, University of California, Davis, CA, USA; [3] Department of Psychiatry and Behavioral Sciences, University of California, Davis, CA, USA; [4] Department of Psychology, University of California, Davis, CA, USA
To test the hypothesis that adaptive task difficulty promotes transfer of training gains, we measured behavioral and neural plasticity in fMRI sessions before and after 10 sessions of working memory updating (WMU) training, in which task difficulty either adaptively increased in response to performance or was fixed. Adaptive training resulted in far transfer to an untrained episodic memory task and activation decreases in striatum and hippocampus on a trained WMU task, and the amount of training task improvement was associated with near transfer to other WMU tasks and with hippocampal activation changes on both near and far transfer tasks. These findings encourage use of adaptive task difficulty to broaden transfer of training gains and maximize changes in task-related brain activity.

**A-0957 Parallel activation of implicit and explicit category learning processes in case of naturalistic stimuli**
Anett Rago [1], Mate Varga [2], Eszter Somos [3]
[1] University of Eotvos Lorand, Budapest [2] Budapest University of Technology and Economics [3] University of Hull
We investigated the nature of the background learning processes in a supervised category-learning paradigm. An information integration task was used with naturalistic Gestalt-like stimuli, where all the exemplars also possessed non-diagnostic idiosyncratic features. Additionally, we introduced a salient explicit characteristic in a 5% of cases. Hit rates show that the 89% of participants detected the explicit rule. Furthermore, 67% of them were able to learn the complex implicit rule. Their memory for individual exemplars in the immediate test was as weak as a week later. With our method we could test the long-term retention of the learned information, and the memory for individual exemplars. By activating both explicit and implicit category learning processes we argue against their competitive nature.

# Intrusive memories in daily life and psychopathology: a special form of memory challenging mainstream theories?

**S0044 session**
Thursday, 21 July 2016 | 15:30 - 17:30 | Room 1
**Chair/Organizer: Alex Lau-Zhu**
**Discussant: Emily A. Holmes**

**A-0380 Using diary methods to study participants' spontaneous and film-induced intrusive memories**
Lia Kvavilashvili [1], Ben Plimpton [1], Chris Brewin [2]
[1] University of Hertfordshire, Hatfield, UK; [2] University College London, London, UK
Intrusive memories of real traumatic events have been typically studied via interview/questionnaire methods, whereas research on non-repetitive involuntary autobiographical memories (IAMs) has used predominantly diary methods. In two studies, we adopted a structured, event-contingent diary method to study participants' own intrusive memories over a 7-day period (Study 1), or non-personal intrusions over a 3-day period after watching a traumatic film of road traffic accidents (Study 2). In addition to studying the intrusion frequency, on-going activities and triggers, Study 2 also examined the effects of initial intrusions on the number of intrusions recorded in diaries and individual differences in imagery. Results show that a structured diary method can be successfully employed to study personal and film-induced intrusive memories in general population.

**A-0381 Can we capture intrusive memories in the lab? The role of personalised cues**
Ben Plimpton, Lia Kvavilashvili
University of Hertfordshire, Hatfield, UK
Intrusive memories (IM) of past traumatic events have often been studied via interviews/questionnaires, though more recently a diary has been used. The aim of the present research was to capture participants' own currently intrusive memories in the lab using a modified version of the vigilance task developed to study ordinary (non-repetitive) involuntary autobiographical memories (Plimpton et al., 2015). Participants are probed eight times for current thoughts during a monotonous vigilance task in which they are exposed to a stream of verbal cues, some of which relate to the content of their IM. The frequency of reported IM, the identified triggers, and associated characteristics was examined, with results suggesting the viability of this method for studying IM under controlled laboratory conditions.

**A-0382 Involuntary intrusions versus voluntary memory of trauma films: dissociable consolidation processes?**
Alex Lau-Zhu [1], Rik Henson [1], Emily A. Holmes [1,2]
[1] Medical Research Council Cognition and Brain Sciences Unit, Cambridge, UK; [2] Department of Clinical Neuroscience, Karolinska Institutet, Sweden
Introduction: Involuntary intrusive memories of psychological trauma are the hallmark symptom of post-traumatic stress. Involuntary intrusions -but not voluntary recognition- of trauma films have shown to be selectively disrupted by a cognitive task procedure applied during the time window of memory consolidation of the trauma films, challenging standard consolidation theories which would expect a general disruption effect. Methods & Results: In unpublished experiments, we investigated the mechanisms of such selective disruption by devising novel trauma film memory measures, and found that the cognitive task procedure disrupted self-reported intrusions both outside and within the laboratory. Conclusion: The modulation of memory 'intrusiveness' without compromising voluntary memory of trauma is ethically desirable. Do standard consolidation theories need revision to accommodate intrusive emotional phenomena?

**A-0383 Does dual-tasking neutralize emotional memory and reduce conditioned responses?**
Iris Engelhard, Angelos-Miltiadis Krypotos, Arne Leer, Evi-Anne van Dis
Clinical Psychology, Utrecht University, The Netherlands
This experiment tested whether dual-tasking (i.e., recalling the emotional memory while performing a visuospatial dual-task) neutralizes emotional memory, thereby decreasing conditioned responses. Undergraduates completed a differential conditioning paradigm with pictures of food items as conditioned stimulus (CS) and an aversive film clip (someone vomiting) as unconditioned stimulus (US). Following acquisition, there were three conditions: dual-tasking, recall only, or a filler task. Next, in the test phase, CSs and actual food items were presented. We expected that dual-tasking, relative to control conditions, would decrease vividness/emotionality of the US memory, reduce CRs and increase willingness to eat the actual food items. Results and theoretical and clinical implications of the findings are discussed.

**A-0384 Opposing effects of negative emotion on associative and item memory and its relation to intrusive memory**
James Bisby, Lone Hoerlyck, John King, Neil Burgess
Institute of Cognitive Neuroscience, University College London, UK
Experiencing a negative event can enhance memory for individual items, whilst disrupting associative memory processes, and in some situations can lead to intrusive imagery re-experiences as in posttraumatic stress disorder (PTSD). Little is known about the specific mechanisms that underpin these memory disturbances and unwanted intrusions. We will present data showing that negative events can down-regulate hippocampal function to disrupt associative/contextual memory representations. In contrast, we show that emotional events up-regulate the amygdala to enhance item memory. In addition, using results from trauma paradigm studies, we will discuss how this imbalance between reduced associative/contextual memory and enhanced item/sensory representations, and their neural correlates, contribute to intrusive memories, and how these results relate to dual-representation theories of PTSD.

**A-0385 Neural mechanisms of conditioned intrusive memory formation revealed by fMRI and sleep recording**
Lisa M. Grünberger [1], Stephan F. Miedl [1], Jens Blechert [1,2], Martin Kronbichler [2,3], Victor I. Spoormaker [4], Frank H. Wilhelm [1]
[1] Clinical Stress- and Emotion Laboratory, Division of Clinical Psychology, Psychotherapy and Health Psychology, University of Salzburg, Salzburg, Austria [2] Center for Cognitive Neuroscience, University of Salzburg, Salzburg, Austria. [3] Neuroscience Institute, Christian-Doppler-Clinic, Paracelsus Medical University Salzburg, Salzburg, Austria [4] Max Planck Institute of Psychiatry, Department of Translational Research in Psychiatry & Neuroimaging, Munich, Germany
Using a novel fear conditioning procedure with aversive films ("conditioned intrusion paradigm"), previous studies from our laboratory (Wegerer et al., 2013, 2014) demonstrated that intrusions are conditioned emotional responses. Since we have not addressed the neural mechanisms underlying intrusive memory formation, we implement an adaptation of the paradigm in fMRI and record one polysomnographic night of sleep at

subjects´ home. For the following 3 days, participants enter any occurring intrusive memory of the aversive films into an electronic diary application. Preliminary analyses indicate successful fear acquisition, showing differential activation of the amygdala, insula and ACC. Results regarding the hypothesized positive relationship between amygdala activation during conditioning and subsequent intrusions, with REM sleep as moderator, will be presented at the symposium.

**A-0386 Narrative thinking, amnesia and fictional memories**

Martin A. Conway
Department of Psychology, City University London

In this paper I develop the concept of 'narrative thinking'. Narrative thinking occurs when the brain is in default mode and not task-focused. It features autobiographical remembering, future thinking, and what I will term 'fictionalization' of the self. Four attributes of narrative thinking are coherence, meaningfulness, perspective and emotion. It is the thinking we default to and I suggest that it is critical in maintaining a dynamic and healthy self. I consider how this conceptualization of narrative thinking can be used to give new insights into memory impairment following brain damage and the generation of fictional (false) memories.

**A-0387 Understanding the "intrusiveness" of intrusive memories. Contributions from research on everyday involuntary memories**

Dorthe Berntsen
Department of Psychology and Behavioural Sciences, Aarhus University, Denmark

Involuntary autobiographical memories are memories of personal events that come to mind spontaneously – i.e., with no preceding attempt at retrieval. Such memories are highly frequent in daily life, but were long ignored by modern cognitive psychology. In clinical psychology intrusive involuntary memories have been studied for decades, but only in the context of intrusive memories for negative, stressful events in psychological disorders. I try to combine the two literatures by reviewing evidence for the position that key mechanisms underlying the activation of everyday involuntary memories may be extrapolated to account for the 'intrusiveness' of intrusive memories, when these mechanisms are applied to extreme events and vulnerable populations.

# Mechanisms underlying familiarity and novelty decisions: Two sides of the same coin?

**S0046 session**

Thursday, 21 July 2016 | 15:30 - 17:30 | Room 2

**Chair/Organizer: Christine Bastin, Emmanuel Barbeau, Christopher Moulin**

**A-0452 Familiarity and novelty detection signals: Evidence from neuroimaging and eye tracking**

Alexandros Kafkas

University of Manchester, UK

Novelty and familiarity detection encompasses a wide range of memory functions critically affecting the encoding and the retrieval of information. Recent findings from neuroimaging studies (fMRI and EEG) will be presented showing that novelty and familiarity signals are computed in a distributed network of brain structures critically involving inputs from the MTL, the thalamus and selective fronto-parietal regions. Differential eye movement and pupillometric effects during the processing of familiar and novel stimuli will also be presented, with an emphasis on the utility of the pupil response as an indicator of explicit and implicit memory. Finally, the mechanisms by which contextual novelty (encompassing both familiar and novel stimuli) leads to memory facilitation will be discussed.

**A-0453 Bridging familiarity and novelty detection: a matter of timing?**

Emma Delhaye [1], Emmanuel Barbeau [2], Christopher Moulin [3], Gabriel Besson [1], Christine Bastin [1]

[1] University of Liège, Belgium; [2] University of Toulouse, France; [3] University of Grenoble, France

The computational mechanism underlying novelty detection and how it relates to memory is not yet understood. Some models consider familiarity and novelty to rely on a unique discrimination system while others propose familiarity and novelty to stem from distinct processing pathways. To advocate between these, we probed early behavioral performance of novelty compared to familiarity in twenty participants across two conditions of a speeded go/no-go recognition memory task. The results showed correlated accuracies and biases, symmetrical biases and similar speed between conditions, but poorer performance for novelty. This suggests a unique familiarity/novelty discrimination system, although more efficient for familiarity under high time constraints, possibly due the more fluent perceptual processing of repeated stimuli leading to more automatic familiarity decisions.

**A-0454 Expecting novelty: Effects of expectations on novelty processing**

Martijn Meeter

University of Amsterdam, The Netherlands

Novel stimuli are processed differently by the brain from familiar ones. Using single-cell recording, ERP techniques and fMRI, many reflections of this differential processing can be found throughout the brain. Previously (Schomaker & Meeter, 2015; Neurosci Biobehav Rev), we have argued that some of these signatures of novelty processing are caused by the fact that a novel stimulus has no representation in the brain, while others reflect surprise more than novelty per se. This suggests that these latter brain responses would be attenuated if observers could be brought to expect novelty – i.e., to not be surprised by novelty. Here, I present fMRI and EEG evidence that expecting novelty indeed alters the way that novel stimuli are processed.

**A-0455 Familiarity for faces, but not novelty, improves recognition memory**

Pierre-Yves Jonin [1,2], A. Noël [1], E. Le Lann [1], S. Belliard [3], A. Barillot [1], E. Barbeau [2]

[1] University of Rennes, France; [2] University of Toulouse, France; [3] CHU Pontchaillou, Rennes, France

Influence of experimental or pre experimental familiarity on learning remains controversial. We report findings from a source memory recognition paradigm for faces in 16 young, 20 middle-aged and 20 elderly healthy participants. A careful control of familiarity, either experimentally or pre-experimentally induced, yielded a clear memory improvement by comparison with the novelty condition, across all participants. Further, source memory proved to be boosted through pre-experimental familiarity only in young and middle-aged subjects, while the elderly failed to show any advantage of familiarity. We therefore suggest that declarative learning of faces benefits from familiarity, not novelty, speaking against the “Novelty-Encoding Hypothesis”. This may hold as long as recollection memory processes, known to be sensitive to ageing, are preserved.

**A-0456 Novelty and recognition memory in Alzheimer’s disease**

Chris J.A. Moulin [1], Christophe Fitamen [2], Emmanuel Barbeau [3], Jonathan Meyer [4]

[1] LPNC CNRS 5105, Grenoble, France; [2] Department of Psychology, University of Fribourg, Switzerland; [3] CerCo CNRS 5549, Toulouse, France; [4] Consultation Mémoire, Hospices Civils de Beaune, France

There has been much research into familiarity in Alzheimer’s disease (AD), but less into novelty detection. We tested 12 AD patients and controls in order to examine novelty detection and its relation with recognition memory. Participants studied visual scenes (e.g. living room) and were asked to detect novel elements (e.g. electric guitar). In a later task on the same materials, they reported forced-choice recognition for the elements. Patients with AD showed the expected recognition deficit. They also showed a deficit in detecting novel elements, and these two scores correlated. In particular, people with AD tended to report novel elements when there were none. Finally, memory was no better for elements encountered in the context of novelty.

**A-0457 Recognition goals bias the endorsement of fewer but 'better' goal responses**

Akira R. O’Connor [1], Ravi R. MILL [2]

[1] University of St Andrews, Scotland; [2] Rutgers University, USA

We have previously found that yes/no recognition tasks implicitly bias participants against identifying targets (“old?”) or lures (“new?”) depending on the question the participant is presented with. We interpreted this finding as indicating that the question format establishes a goal judgement category for which the participant emphasises the quality rather than quantity of responses. We sought to explicitly manipulate the goal state by providing mixed monetary incentives for a single response type (e.g. old). Across a range of task domains, we found that explicitly emphasised goal judgements yield analogous shifts in bias. These findings indicate the importance of cognitive control-maintained goal states even in standard recognition paradigms.

**A-0458 Knowing by heart: How visceral feedback shapes familiarity in recognition-memory judgments**

Stefan Kohler, Chris Fiacconi

Western University, Canada

Theories of emotion have noted the importance of afferent autonomic feedback in generating feelings. I will review research that examined whether such feedback also shapes feelings of familiarity. We capitalized on natural variation in baroreceptor-mediated feedback associated with the cardiac cycle, synchronizing the brief presentation of memory probes with individual heartbeats. Across multiple experiments, we found that faces presented during cardiac systole (when feedback is maximal) were more likely endorsed as ‘old’ than those presented during diastole. This effect was observed for faces with fearful or neutral expressions and was specific to trials characterized by feelings of familiarity. Our findings reveal the role of a specific autonomic channel, previously implicated in emotion, in feeling states that pertain to memory experience.

# Grids cells: spatial navigation and beyond

**S0009 session**
Thursday, 21 July 2016 | 15:30 - 17:30 | Room 3
**Chair/Organizer: Aidan Horner, Christian Doeller**
**Discussant: Neil Burgess**

**A-0073 Using Grid Cells for Navigation**
Daniel Bush [1,2], Caswell Barry [3], Daniel Manson [3,4], Neil Burgess [1,2]
[1] UCL Institute of Cognitive Neuroscience, London, UK; [2] UCL Institute of Neurology, London, UK; [3] UCL Department of Cell and Developmental Biology, London, UK; [4] UCL Centre for Maths and Physics in the Life Sciences and Experimental Biology, London, UK
Mammals are able to navigate to hidden goal locations by direct routes that may traverse previously unvisited terrain. Empirical evidence suggests that this goal-directed ‘‘vector navigation’’ relies on an internal representation of space provided by the hippocampal formation. The periodic spatial firing patterns of grid cells offer a compact combinatorial code for location within large-scale space. I will discuss the computational problem of how to determine the vector between start and goal locations encoded by the firing of grid cells, specifically when this vector is longer than the largest grid scale. I will then describe an algorithmic solution to the problem, inspired by the Fourier shift theorem, and introduce several potential neural network implementations of this solution.

**A-0213 Coordinated Grid and Place Cell Replay during Rest**
Freyja Olafsdottir, Francis Carpenter, Caswell Barry
Department of Cell and Developmental Biology, UCL
Hippocampal replay has been hypothesized to underlie memory consolidation and navigational planning, yet the involvement of grid cells in replay is unknown. We found grid cells were spatially coherent with place cells during replay, lagging them by 9ms, with directionally-modulated grid cells and forward replay exhibiting the highest degree of grid-place cell coherence. Suggesting that grid cells are engaged during the consolidation of spatial memories to the neocortex.

**A-0077 Trigonometric computations in entorhinal cortex support wayfinding**
Tobias Navarro Schröder, Christian F. Doeller
Donders Institute for Brain, Cognition and Behaviour, Radboud University, Nijmegen, The Netherlands
Entorhinal grid cells fire in spatial pattern of equilateral triangles, resembling triangulation networks used in cartography. Here, we test the hypothesis that the entorhinal grid-system relates to Euclidian triangulation. We employed computational modelling to demonstrate that paths perpendicular to environmental reference axes are optimal for triangulation. Next, in two fMRI studies with human participants freely navigating virtual environments, we used proxy-measures of grid cell-like activity to estimate putative entorhinal grid orientations, which aligned with optimal triangulation angles relative to environmental axes. Finally, we found, that participants’ distance estimates were more precise on paths along directions preferred by the grid-system. Our results demonstrate a crucial link between the entorhinal grid-system and triangulation, provide a mechanistic explanation for its role in spatial.

**A-0174 Grid-like processing of imagined navigation**
Aidan Horner [1], James Bisby [2], Ewa Zotow [2], Daniel Bush [2], Neil Burgess [2]
[1] University of York, York, UK; [2] Unversity College London, London, UK
Grid cells in the entorhinal cortex (EC) of mammals fire in a spatially periodic manner. Alongside other cells in the medial temporal lobe (MTL), they provide a representation of our location in an environment, and are thought to allow this representation to be updated by self-motion. Grid cells may allow us to move our viewpoint in imagination, a useful function for goal-directed navigation and planning, and episodic future thinking. Using fMRI, we find grid-like signals in human EC during virtual navigation and imagined navigation of the same paths. We show that this signal is present in periods of active navigation and imagination, with a similar orientation in both, and with the 6-fold rotational symmetry characteristic of grid cell firing.

**A-0110 Grid-cell representations in mental simulation**
Jacob L.S. Bellmund [1], Lorena Deuker [1,2], Tobias Navarro Schröder [1], Christian F. Doeller [1]
[1] Radboud University, Donders Institute for Brain, Cognition and Behaviour, Nijmegen, The Netherlands [2] Ruhr University Bochum, Institute of Cognitive Neuroscience, Department of Neuropsychology, Bochum, Germany
Anticipating the future is a key motif of the brain, possibly supported by mental simulation of upcoming events. Single-cell recordings in rodents suggest the ability of spatially tuned cells to represent upcoming trajectories and locations. Using fMRI in humans combined with virtual reality, we show an involvement of the entorhinal grid system during imagination, implying a role of grid-cell computations in mental simulation and future thinking beyond spatial navigation.

**A-0076 Organizing conceptual knowledge in humans with a grid-like code**
Alexandra O. Constantinescu, Jill X. O’Reilly, Timothy E.J. Behrens
University of Oxford
It has been hypothesized that the brain organizes concepts into a mental map, allowing conceptual relationships to be navigated in a similar fashion to space. Grid cells use a hexagonal code to organize spatial knowledge and are the likely source of a precise hexagonal symmetry in the functional magnetic resonance imaging signal. We found that humans navigating conceptual two-dimensional knowledge show the same hexagonal signal in a strikingly similar brain network to that activated during spatial navigation. This grid-like signal is consistent across sessions acquired hours and more than a week apart. Our findings suggest that grid-like codes can be used to organize non-spatial conceptual knowledge, and imply that such global relational codes provide organizing principles for advanced human cognition.

**A-0090 Impaired grid-cell-like representations in humans at genetic risk for Alzheimer’s disease**
Lukas Kunz [1,2], Tobias Navarro-Schröder [3], Christian Doeller [3], Nikolai Axmacher [1,2,4]
[1] German Center for Neurodegenerative Diseases (DZNE), Bonn, Germany; [2] Department of Epileptology, University of Bonn, Bonn, Germany; [3] Donders Institute for Brain, Cognition and Behaviour, Radboud University, Nijmegen, The Netherlands; [4] Department of Neuropsychology, Institute

of Cognitive Neuroscience, Ruhr-University Bochum, Bochum, Germany

The entorhinal cortex is one of the first regions affected in Alzheimer's disease (AD). Human APOE-e4 carriers have an increased risk of developing AD, but the functionality of the grid cell system was never investigated in these subjects. Here, we show that young (around 20 years of age) APOE-e4 carriers exhibit strongly reduced grid-cell-like representations and altered navigational behavior in a virtual arena. Spatial memory performance was not impaired, however, suggesting recruitment of compensatory mechanisms. Indeed, grid-cell-like representations were inversely correlated with hippocampal activity. These findings demonstrate behaviorally relevant entorhinal dysfunction in human APOE-e4 carriers decades before potential disease onset. Investigating the grid cell system may provide a new basic framework for preclinical research on AD in humans and rodents.

# Good vibes for memory: How rhythmic neural activity shapes when, how, and what we remember

**S0016 session**

Thursday, 21 July 2016 | 15:30 - 17:30 | Room 4

**Chair/Organizer: Markus Werkle-Bergner, Myriam C. Sander**

**A-0199 Dynamic Mapping of Spatial and Temporal Networks during Memory-Guided Attention**

Eva Zita Patai, Anna Christina Nobre

[1]Oxford Centre for Human Brain Activity, University of Oxford, Oxford, United Kingdom [2]Dept. of Experimental Psychology, University of Oxford, Oxford, United Kingdom

Spatial and contextual associations in long-term memory are known to guide attention through top-down biasing of sensory processing. In this study, we used magnetoencephalography (MEG) to reveal the spatial and temporal dynamics of the brain areas involved during the incremental learning of spatial contextual associations, and how this relates to neural and behavioural signatures of memory-based perceptual facilitation. An increase in theta activity during learning was localized to the left hippocampus, precuneus, and frontal-parietal areas. Hippocampal power changes, specifically, correlated with behavioral benefits of memory-guided attention in a subsequent attention-orienting task. Our results provide important crossover between neural signatures that reveal the dynamics in networks participating in learning and the use of spatial-contextual information to guide adaptive behaviour.

**A-0263 Frontal-Midline Theta Oscillations as a Gear-Box in the Brain**

Paul Sauseng, Barbara Berger, Tamas Minarik

Ludwig-Maximilian-University Munich, Germany

Depending on which kind of information needs to be retained in working memory, and dependent on what exact mental transformation this information has to undergo, different working memory sub-processes will be necessary. These sub-processes are supposed to be implemented within different cortical networks. But how are these networks coordinated? How is communication in one reinforced and coupling of another one reduced depending on the task-requirements? Here we will provide data arguing that slow brain oscillations in the prefrontal cortex – and specifically their phase to which fast frequency brain activity is locked - allow a simple and efficient mechanism by which fronto-parietal brain networks can be dynamically coupled or desynchronized, and hence, working memory processes can be coordinated.

**A-0197 Content-specific representations via intracranial EEG oscillations**

Nikolai Axmacher [1]

[1] Department of Neuropsychology, Institute of Cognitive Neuroscience, Faculty of Psychology, Ruhr University Bochum, Bochum, Germany

EEG oscillations are widely believed to reflect brain states of improved information processing: Local (“event-related”) synchronization increases the impact of neural activity on downstream areas; inter-regional synchronization reflects the coordination of receptive time periods (the “communication through coherence” hypothesis) and may facilitate the induction of spike-timing dependent plasticity. These general computational mechanisms are likely to play a role for various cognitive operations including those involving memory. In addition, recent data from our group as well as others indicate that the temporal dynamics and the spatial distribution of oscillatory activity reflect specific contents during perception and memory. I will describe these findings and discuss their potential relevance for theories of neural coding.

**A-0205 Hippocampal pattern completion and gamma power increase during recollection**

Bernhard P. Staresina

School of Psychology, University of Birmingham, Birmingham, UK

How do we retrieve vivid records of our past upon encountering a simple reminder? Computational and theoretical work suggests that this feat is accomplished by pattern completion processes in the hippocampus. However, evidence for such a mechanism as gleaned by functional neuroimaging has remained elusive, and the macroscopic dynamics driving pattern completion are poorly understood. Here we recorded direct intracranial Electroencephalography from the human hippocampus as participants performed a source memory task. We found evidence for enhanced representational reinstatement of individual learning episodes during successful source retrieval. Critically, this reinstatement was preceded by power increases in the high gamma band (50-100 Hz) and followed by a sustained decrease in the alpha/beta band (8-30 Hz).

**A-0196 Rhythmic neural alpha activity during encoding tracks the depth of mnemonic processing**

Myriam C. Sander [1], Yana Fandakova [1,2], Thomas H. Grandy [1], Yee Lee Shing [1,3], Markus Werkle-Bergner [1]

[1] Max Planck Institute for Human Development, Berlin, Germany; [2] University of California, Davis & Berkeley, United States; [3] University of Stirling, Scotland

Craik and Lockhart (1972) suggested that the quality of memory traces depends on the depth of semantic elaboration. Decreases in low-frequency activity provide time frames for information generation and integration. We argue that prolonged alpha (~ 10 Hz) desynchronization allows for deeper semantic elaboration on individual items. Younger and older adults studied scene-word pairs in several learning and recall cycles in an EEG setting. Decreases in alpha activity during initial encoding (1 – 2.5 sec. after stimulus onset) gradually tracked differences in memory strength, predicting the time point of successful recall (after one or two learning cycles). Since younger and older adults reveal qualitatively similar effect patterns, we suggest that successful encoding depends on comparable neural mechanisms across the adult-lifespan.

**A-1033 The Synchronization/De-Synchronization Model: A New Account on Oscillations and Memory**

Simon Hanslmayr [1], George Parish[2], Howard Bowman[1,2]

[1] School of Psychology, University of Birmingham, UK; [2] School of Computing, University of Kent, UK

Brain oscillations are one of the core mechanisms underlying the formation and retrieval of episodic memories. However, a conundrum exists as some studies highlight the role of synchronized oscillatory activity, whereas others highlight the role of desynchronized activity for memory. We here present a new realistic neural network model that resolves this conundrum by integrating the two opposing oscillatory behaviours. Specifically, the model builds on the assumption that synchronization and desynchronization reflects a division of labour between a hippocampal system that binds different aspects of an episode, and a neocortical system that represents the sensory information of these different aspects. While the hippocampal neurons form memories via theta driven synchronization, the neocortical neurons represent information via alpha desynchronization.

**A-0200 Oscillatory mechanisms of memory reactivation during sleep**

Björn Rasch [1,2]

[1] University of Fribourg, Departement of Psychology, Division of Cognitive Biopsychology and Methods, Switzerland [2] Zurich Center for Interdisciplinary Sleep Research (ZiS), Zurich, Switzerland

The beneficial effect of sleep on memory consolidation is assumed to rely on a spontaneous reactivation of memory during Non rapid-eye movement (NREM) sleep. Consequently, inducing reactivations by presenting external memory cues during NREM sleep improves consolidation processes. In the talk, I will give a brief overview of our recent findings on the oscillatory correlates associated with successful memory reactivation during sleep. In particular, I will discuss the potential role of slow-waves, sleep spindles and theta oscillations in the reactivation and stabilization of reactivated memories during NREM and REM sleep.

# Beyond Yes and No: Memory is Conditional

**S0034 session**
Thursday, 21 July 2016 | 15:30 - 17:30 | Room 5
**Chair/Organizer: Avi Karni, Sara Ferman**
**Discussant: Peter De Weerd**

**A-1032 Cerebral Pre-Requisite for Optimal Sleep-Related Procedural Memory Consolidation**
Geneviève Albouy
Movement Control and Neuroplasticity Research Group, Kinesiology Department, KU Leuven, Leuven, Belgium
Understanding the conditions under which optimal memory consolidation processes are triggered is one of the most exciting challenges in our field. I will review neuroimaging studies demonstrating that optimal motor memory consolidation in young healthy adults is conditional on the particular combination of (1) specific patterns of cerebral activity and connectivity - within and between the hippocampus and the striatum - during memory encoding and (2) subsequent sleep episode. I will also present recent results showing that the recruitment of these cerebral structures can be modulated by different factors including task requirements, performance level and behavioral interference, which in turn can influence consolidation processes. Altogether, these results should constitute an important stepping-stone in the quest for memory optimization.

**A-1061 Conditions that matter: skill learning and long-term procedural memory in senescence and ADHD**
Avi Karni
University of Haifa, Haifa, Israel
As we develop and mature, procedural memory consolidation processes are more stringently controlled (gated). In some learning conditions, stringent gating may lead to less-than-expected performance gains; this may be the case in the elderly and individuals with ADHD. However, post-training sleep can override these constraints on procedural memory consolidation in both groups. More stringent gating may constitute an advantage; it is implemented through changes in the time windows in which new knowledge can be tested for relevancy and consistency before it is allowed to consolidate. Thus, puberty, senescence, as well as atypical attention mechanisms bring about more stringent selectivity to what is to be consolidated into long-term memory rather than a decrease in the potential for plasticity per se.

**A-1034 Sleep-facilitated motor memory consolidation in older adults depends on initial encoding**
Bradley R. King
Movement Control and Neuroplasticity Research Group, KU Leuven, Leuven, Belgium
The majority of research to date suggests that, unlike in younger individuals, sleep following initial learning of a motor skill does not enhance subsequent consolidation processes in older adults. In this presentation, I will present recent research suggesting that this story is not that simple. I will review data indicating that sleep can facilitate memory consolidation in healthy elderly; and, this beneficial effect appears to be dependent on performance levels and cerebral activation patterns during the initial learning session. These data will be discussed in the context of the extant literature on young adults in order to provide a more detailed characterization of age-related effects on motor memory encoding and consolidation.

**A-1051 Unlike adults, children need special ‘enhanced' conditions to learn a complex language task**
Sara Ferman
Tel Aviv University, Tel Aviv, Israel & The Center for Academic Studies, Or Yehuda, Israel
Do the immature memory mechanisms of children benefit from ‘enhanced’ learning conditions? Under restrictive laboratory conditions, children (8 year olds), unlike adults, showed limited ability to learn and use an implicitly instructed complex linguistic rule over multiple daily sessions. Difficulties were encountered even in implicit phonological aspects of the task, but mainly in attaining explicit knowledge of the semantic aspect and consequently in rule generalization. However, explicit instruction, increased item variability, corrective feedback, or providing illustrative pictures, enhanced children’s implicit morpho-phonological pattern learning. Importantly, in each of these 'enhanced' conditions meta-linguistic problem solving improved, leading to explicit knowledge; this in turn enabled rule generalization. 'Enhanced' conditions, however, did not close the age gap, highlighting the importance of brain maturation.

**A-1047 Beyond age: A Developmental Perspective of the Dependence of Skill Learning on Conditions**
Esther Adi-Japha
School of Education, Bar-Ilan University, Ramat-Gan, Israel.
Developmental differences in the acquisition, consolidation, and retention of skills cannot be discussed independently of other conditions that affect task performance level. Training gains in children vs. young adults were shown to depend on many factors, including task complexity and task solution strategy. Furthermore, in some tasks consolidation gains may critically depend on a sleep interval following the learning experience in young adults, but not in children. Consolidation gains in children are also less susceptible to interference. Moreover, there is data to suggest that in children retention may depend on executive control. While long-term retention in adults persists for months, and even years, children may fully retain only some aspects of task performance.

**A-0293 Do memories consolidate? Insights from visual skill learning studies**
Gesa Lange

Previous studies have shown that skill learning, although quite stable in general, can be interfered with by additional training at a later time on similar tasks/stimuli. Our data support the notion that memory traces after their formation remain malleable, and behavioural interference occurs when memory formation in two tasks recruits a largely shared (i.e. insufficiently segregated) neuronal population subjected to incompatible requirements on network connectivity. In our experiment, training was completely serial; thereby maximizing the possibility that one task would induce a fully consolidated memory trace before onset of training the other one. Nevertheless, we found strong interference between the two tasks. Model simulations show that interference is best explained by reactivation and representational competition.

**A-1055 Direct and indirect measures of contextual memory in patients with traumatic brain injury**
Eli Vakil
Department of Psychology and Leslie and Susan Gonda Multidisciplinary Brain Research Center, Bar-Ilan University, Ramat-Gan, Israel

Previous studies reported that memory for contextual information in patients with traumatic brain injury (TBI) was impaired when measured directly but context effects were nevertheless beneficial. Eye movements were monitored in patients with moderate-to-severe TBI and healthy individuals. Participants were presented with photographs of faces (i.e. Target) shown each wearing a singular hat (i.e. Context). For both groups, eye tracking showed longer dwell-time on targets during the learning phase for the stimuli correctly answered subsequently. At the test phase, dwell-time on targets was longer for the control group than for the TBI group. The results suggest that the source of the differences in contextual memory performance in TBI is at the retrieval rather than the encoding stage of memory.

# Autobiographical Memory and Psychopathology

**S0050 session**

Thursday, 21 July 2016 | 15:30 - 17:30 | Room 6

**Chair/Organizer: Mirjam Vermeulen, Fortesa Kadriu**

**A-0868 OGM pre trauma as a vulnerability factor for current posttraumatic symptoms**

Sabine Schönfeld, Judith Schäfer, Michael Höfler, Hans-Ulrich Wittchen
Technische Universität Dresden, Dresden, Germany

Overgeneral memory (OGM) has been shown to be a correlate of several disorders, i.e. depression or PTSD. A longitudinal design pre/post deployment was implemented to investigate the etiological role of OGM and incident trauma in the occurrence of later symptoms of PTSD and depression. 449 soldiers (26th/27th German ISAF deployment cohort) were assessed pre/post deployment. At both times, the AMT together with further measures of rumination, working memory capacity, experiential avoidance and emotion regulation was given. Also, symptoms were assessed. First analyses show that OGM may be involved in the development of symptoms. Results regarding its interplay with cognitive emotional variables will be presented and discussed in the framework of current theories on OGM and psychopathology.

**A-0871 Autobiographical Memory and Future Goals in Dissociative Identity Disorder and Complex PTSD**

Rafaële J. C. Huntjens, Ineke Wessel
University of Groningen, Groningen, The Netherlands

The capacity to integrate past personal experiences is essential for the formation of a coherent identity. In this study, we investigated autobiographical memory (i.e., memory specificity, self-defining memories) and future goals in patients with Dissociative Identity Disorder (DID). These patients are hypothesized to selectively compartmentalize information in different identity states. Control groups consisted of patients with complex PTSD, healthy controls, and DID simulators. In both the DID and PTSD patients, trauma played a central role in the retrieval of self-defining memories as well as their formulation of goals for the future. Irrespective of identity state, DID patients were characterized by a lack of memory specificity and they retrieved a higher proportion of avoidance goals compared to PTSD patients.

**A-0872 Eating disorder symptoms and autobiographical memory bias in an analogue sample**

Ineke Wessel, Rafaële J. C. Huntjens
University of Groningen, Groningen, The Netherlands

Cognitive theories hold that dysfunctional cognitive schemas and associated information-processing biases are involved in the maintenance of psychopathology. In eating disorders (ED), these schemas would consist of self-evaluative representations, in which the importance of controlling eating, shape and weight is overrated. We examined whether ED symptoms are associated with a bias towards ED themes in negative self-evaluative autobiographical memories. Undergraduate females (n = 130) retrieved three memories of situations in which they had felt particularly bad about themselves. Prior to retrieval they had completed either an ED-related priming or a control task. Preliminary results suggest that ED symptoms as well ED priming predicted ED-related autobiographical memory. ED-content did not seem to affect mood or self-evaluation in an important way

**A-0874 Characteristics and content of intrusive images in patients with eating disorders**

Fortesa Kadriu, Julie Krans, Laurence Claes
KU Leuven, Leuven, Belgium

Intrusive images play a key role in maintaining eating disorders (ED) (Brewin, Gregory, Lipton & Burgess, 2010). This study explored the occurrence and content of intrusive mental images in patients with EDs. Data were collected from 61 female patients with different types of ED, using a set of self-report questionnaires. The majority of participants (92.1 %, N = 58) experienced intrusive images that typically contained visual, motion, and internal sensation modalities. Images tended to be vivid and distressing. Content analysis of the images showed that typical themes included distorted body image, body comparison, or negative comments from others about their body/weight. Differences among ED types in perspective of the images (observer or field perspective) and in themes, will be discussed.

**A-0877 Computerized Memory Specificity Training**

Keisuke Takano [1], Jun Moriya [2], Filip Raes [1]
[1] KU Leuven, Leuven, Belgium; [2] Kansai University, Osaka, Japan

Reduced autobiographical memory specificity (rAMS) is a vulnerability factor for depression, which has been a target of therapeutic interventions (e.g., Memory Specificity Training; MeST). In the current study, we developed an online tool to provide the essence of the MeST. This web-application analyzes participants' memory linguistically, and guides participants to enhance memory specificity. We asked participants with rAMS to use the web-application for two weeks (n= 21 and 19 for the experimental and control condition, respectively). Participants in the experimental condition showed a significant increase in memory specificity (d= 1.03), although the control group did not show any changes. These results are encouraging as to the effectiveness of the computerized MeST in enhancing memory specificity.

**A-0878 Selective autobiographical memory bias and memory bias modification in social anxiety**

Julie Krans
KU Leuven, Leuven, Belgium

Cognitive models of Social Anxiety Disorder (SAD) propose that social anxiety is maintained by a bias towards recalling negative experiences of social encounters. In this presentation, data will be presented that support the presence of a social anxiety-related autobiographical memory bias in high socially anxious students as well as SAD and PTSD patients. Subsequently, a Cognitive Bias Modification training was developed to induce positive expectations of future social encounters in healthy students. This training was based on neuropsychological research showing that biases that occur in autobiographical memory recall also similarly occur in future projections of the self. Thus, we expected that the CBM training would also induce a more positive recall bias in interaction with social anxiety.

**A-0879 Memory centrality of a distressing event and its effect on post-traumatic stress symptoms**

Mirjam Vermeulen [1], Adam D. Brown [2], Filip Raes [1], Julie Krans [1]
[1] KU Leuven, Leuven, Belgium; [2] NYU School of Medicine, New York, USA

Research has shown that individuals who tend to place the memory of a traumatic event more central in their life-story experience more symptoms of psychopathology. In our experiment, the effect of a centrality Cognitive Bias Modification (CBM) training on event centrality, symptoms of PTSD and depression was tested. Participants were asked to bring to mind their most central memory of a negative life event. Participants were randomly assigned to an experimental condition, aiming to decrease centrality, or a control condition.Results showed that the CBM was able to decrease event centrality and symptoms of PTSD in healthy participants who reported highly central memories of negative life events. The centrality CBM has potential to inform future applications in clinical practice.

# Forgetting III

**I022 session**

Thursday, 21 July 2016 | 15:30 - 17:30 | Room 7

**Chair/Organizer: Karl-Heinz T. Bäuml**

**A-0391 Beneficial memory effects of a forget cue: Reconciling prominent views on list-method directed forgetting**

Bernhard Pastötter, Karl-Heinz T. Bäuml
Regensburg University, Regensburg, Germany

In list-method directed forgetting (LMDF), participants are cued to forget a previously studied list (List 1) before studying a second list (List 2). Compared with remember-cued participants, forget-cued participants typically show impaired List-1 recall and improved List-2 recall, referred to as the costs and benefits of LMDF. Prominent views on LMDF suggested that the benefits arise from selective rehearsal at encoding or (inhibition- or context-based) interference reduction at retrieval. In contrast, more recent accounts of LMDF did not incorporate these views. We report the results of a series of recognition and recall experiments, which indicate that both (a restrictive version of) selective rehearsal and interference reduction at test contribute to the benefits of LMDF, thus reconciling prominent views on LMDF.

**A-0473 Beneficial effects of selective memory retrieval**

Karl-Heinz T. Bäuml, Lisa Wallner
Department of Experimental Psychology, Regensburg, Germany

Selective memory retrieval impairs recall of related episodes when study context access is maintained, but it improves recall of other items when study context access is impaired (Bäuml & Samenieh, 2010). Whereas the detrimental effect is retrieval specific and arises after selective retrieval, but not selective restudy, the beneficial effect occurs after both forms of item repetition. We examined whether the beneficial effect differs in amount between retrieval and restudy trials and is influenced by retrieval difficulty. We found larger beneficial effects after retrieval than restudy, and larger beneficial effects when retrieval was difficult. On the basis of the view that the beneficial effect reflects context reactivation processes, the results indicate that context reactivation is most effective after difficult retrieval.

**A-0610 Investigating the Effects of Forgiveness on Intentional Forgetting.**

Saima Noreen, Raynette Bierman, Malcolm D. MacLeod
University of St Andrews, Scotland, UK. (Now moved to Goldsmiths, University of London, UK)

Forgiveness is considered to play a key role in the maintenance of social relationships, and the ability to move forward with our lives. But why is it that some of us find it easier to forgive and forget than others? This study explored the supposed relationship between forgiveness and forgetting. Participants were initially given a series of hypothetical incidents and asked to indicate whether or not they would forgive the transgressor. They were then asked to complete the Think/No-Think task. Results revealed that whilst participants were successful at suppressing the details for incidents which had been forgiven, no such forgetting effects emerged for incidents that had not previously been forgiven. Implications for the relationship between forgiveness and memory are considered.

**A-0620 Retrieval induced forgetting (RIF) of autobiographical memories of experimentally induced real-life experiences**

Eszter Somos, Tjeerd Jellema, Giuliana Mazzoni
University of Hull

We address methodological limitations of previous studies in investigating RIF in consolidated autobiographical memories (ABMs). In this study autobiographical memories were created by experiencing real-life, experimenter-controlled events. The events were ‘team-building exercises’ consisting of two sets of games, which were made distinctive by being played in different contexts (rooms and buildings). Two days later in the retrieval practice half of the memories about one set were retrieved (rp+) while the other half (rp-) and memories from the other set (nrp) were not. At the final test the RIF effect was significant: participants retrieved less rp- memories than the nrp ones, demonstrating that RIF plays a role in autobiographical memory.

**A-0642 Retrieval-induced Forgetting as a Motivated Cognition Effect**

Gennaro Pica, Antonio Pierro, Arie W. Kruglanski
[1] University of Rome “La Sapienza”, Rome, Italy; [2] University of Maryland, College Park, USA

The present contribution reports evidence for a motivational account of retrieval-induced forgetting (RIF, Anderson, Bjork, & Bjork, 1994). Specifically, we report studies showing that the need for closure (Webster & Kruglanski, 1994) significantly enhances the forgetting of undesired materials to prevent uncertainty and confusion from the intrusion of such memories. Furthermore, we also report an experiment that shows that RIF does not respond blindly to the forgetting of interfering items during selective-retrieval, but instead is influenced by the type of item to be recalled and their congruency with the retriever’s goals. Overall, the present findings are consistent with the view that motivation can affect the magnitude of RIF effects that, in turn, can serve as mechanisms for justifying desired conclusions.

**A-0676 The Right, but Not the Left Prefrontal Cortex is Necessary for the Suppression of Unwanted Memories**

S. Shanker [1,2,3], O. H. Turnbull [2], M. R. Bracewell [2], M. C. Anderson [1]
[1] MRC Cognition and Brain Sciences Unit, Cambridge United Kingdom, [2] School of Psychology, Bangor University, North Wales, United Kingdom, [3] Department of Psychology, Bournemouth University, United Kingdom

When confronted with an unwelcome reminder, people often exclude the unwanted memory from awareness, a process that causes forgetting.This suppression-induced forgetting (SIF) can be measured using the Think/No-Think task (TNT) task. Imaging work indicates that suppressing retrieval engages the right dorsolateral prefrontal cortex (DLPFC), a region critical for inhibitory control, but no work has examined whether right-DLPFC is necessary for suppression. We adapted the TNT task for patients with frontal lesions (n=34). Strikingly, whereas patients with left-PFC lesions showed robust SIF, those with right-PFC lesions showed none, and this interaction was significant. These findings highlight the necessary and selective role of right DLPFC in enabling inhibitory control over memory, and support the broader role of right-PFC in inhibitory control.

# Neuroscience of memory IV

**I123 session**
Thursday, 21 July 2016 | 15:30 - 17:30 | Room 8
**Chair/Organizer: David Smith**

**A-0643 Intentional rehearsal bypasses the hippocampus during episodic memory encoding**
Aya Ben-Yakov [1], Ido Toren [1], Noga Cohen [2], Yadin Dudai [1]
[1] Weizmann Institute of Science, Rehovot, Israel; [2] Columbia University, New-York, USA
One of the most traditional methods of engraving information in our minds is by rehearsing it. For episodic memory, we find that intentional rehearsal of an episode immediately upon its conclusion increases subsequent memory. How does this transpire? Given previous findings that hippocampal activity at the end of events predicts subsequent memory, a plausible supposition could be that rehearsal increases this offset response. In two independent fMRI experiments employing movie clips as memoranda, we find that memorization does not increase hippocampal activity. Moreover, it eliminates the subsequent memory effect observed at event offset during passive viewing. This indicates that rehearsal promotes memory via an alternate route, with initial evidence suggesting this may be linked to an increase in parietal activation.

**A-0654 Explicit warnings on false memories: An event-related potential study**
Sara Cadavid [1], Maria Soledad Beato [2]
[1] University of Minho; [2] Universidad de Salamanca
Event-related potentials (ERP) were used to investigate the effects of explicit warnings on false recognition using the Deese-Roediger-McDermott (DRM) paradigm. In this paradigm, words associated to a non-presented critical lure are studied and, subsequently, critical lures are often falsely remembered/recognized. The FN400 (300-500 ms), the left-parietal (500-800 ms), and the late right-frontal (1000-1500 ms) old/new effects, associated with processes of familiarity, recollection and monitoring, were analyzed. The results showed a robust false recognition effect in both Warning and No-Warning conditions. At ERP level, true and false recognition showed similar patterns in Warning and No-Warning conditions. Findings suggest that, even when participants are provided with more strategic instructions, true and false recognition share some common underlying processes.

**A-0706 Baseline connectivity between the hippocampus and medial prefrontal cortex is associated with processing and encoding schema-consistent events**
Niv Reggev [1], Alexa Tompary [2], Amnon Yacoby [1], Oded Bein [2], Lila Davachi [2,3], Anat Marl [1]
[1] Hebrew University of Jerusalem, Israel [2] New York University, NY, USA [3] Center for Neural Science, NYU, USA
Schemas hold a pivotal role in memory by promoting the encoding of schema-consistent events. Here we address for the first time the effect of schemas on offline resting periods, focusing on the hippocampus (HC) and medial prefrontal cortex (mPFC) connectivity profile. Participants completed alternating rest and task scans; task included incidental encoding of schema-consistent or inconsistent materials. Across participants, the similarity between HC-mPFC connectivity patterns at baseline and post-schema-consistent blocks was greater than the similarity between baseline and post-schema-inconsistent blocks. Importantly, baseline and post-consistency connectivity patterns predicted subsequent memory only for schema-consistent items. Memory for schema-inconsistent information was correlated with task activity. These results suggest that schema-consistency is the preference of the HC-mPFC circuit, whereas schema-inconsistency requires additional resources.

**A-0715 Placing Memories in Context: Hippocampal Representations Promote Interference-Free Retrieval of Context-Appropriate Memories.**
David A. Bulkin, David M. Smith
Department of Psychology Cornell University Ithaca, NY USA
Returning to a familiar context is a powerful trigger for the retrieval of relevant memories and a likely benefit of this phenomenon is that memories from other contexts are less likely to intrude and cause interference. I will present evidence that hippocampal ensemble firing patterns represent the context and, more importantly, the characteristics of these representations are consequential for memory retrieval. When the current hippocampal representation is not very distinct, subjects experience interference and they make retrieval errors. In contrast, when highly distinctive hippocampal representations are present, subjects are better able to retrieve context-appropriate memories and they are less susceptible to interference from memories that belong to other contexts. Thus, hippocampal context representations provide an important mechanism for preventing interference.

**A-0726 Functional and structural correlates associated wtih mnemonic control**
Garikoitz Lerma-Usabiaga [1], Silvia A. Bunge [2], Lorna García [1], Manuel Carreiras [1,3], Pedro M. Paz-Alonso [1]
[1] BCBL. Basque Center on Cognition, Brain and Language, Donostia-San Sebastián, Spain; [2] Helen Wills Neuroscience Institute & Department of Psychology, UC Berkeley, CA, USA; [3] Ikerbasque. Basque Foundation for Science, Bilbao, Spain.
Research evidence with the Think/No-Think paradigm have showed that attempts to suppress memory retrieval are associated with memory reductions for these items in a subsequent memory test. This form of intentional retrieval suppression is associated with concomitant increases in lateral PFC engagement and reduced hippocampal activation. Here, we used imageability to equate between-participants deployed strategies during suppression attempts, as well as to equate task demands across conditions. Behavioral results replicated memory suppression effects, functionally we observed no activation differences in PFC engagement between conditions, but a significant decrease in bilateral hippocampal activation during No-Think. Structural analysis revealed that reduced anterior hippocampal volume and white-matter microstructure of white-matter tracts connecting hippocampus with frontal regions were associated with memory suppression effects.

**A-0727 Optimizing trial timing in memory experiments for fMRI decoding analyses**
Dasa Zeithamova, Maria-Alejandra De Araujo Sanchez, Anisha Adke
University of Oregon, USA
Multivariate, “brain decoding” approaches to fMRI data analysis, such as representational similarity analysis (RSA), have become increasingly popular. However, it is unknown how to optimize designs for decoding in memory studies where the number of presentations of individual items is strongly constrained. Here, participants encoded 12 unique stimuli from 2 categories under 5 different trial timing designs, ranging from slow event-related (2 repetitions per stimulus) to rapid trials (4 repetitions per stimulus; with and without jitter). All designs had equal run length. Category decoding was high and equivalent across designs. Item decoding was more reliable and predictive of subsequent memory in slow designs. Results

highlight reliability of RSA in memory designs, even with small number of stimuli and repetitions.

**A-0731 Associative reinstatement memory measures hippocampal function in Parkinson's Disease**

Melanie Cohn[1,3], Irene Giannoylis[2], Maya De Belder[4], Mary Pat McAndrews[1,2,3]
[1] Toronto Western Hospital UHN, Toronto, Canada; [2] Krembil Research Institute, Toronto, Canada; [3] University of Toronto, Toronto, Canada; [4] Ghent University, Ghent, Belgium

In Parkinson's Disease(PD), hippocampal atrophy is associated with cognitive decline, but clinical memory measures which tap hippocampal function also rely on executive functions or use material that is not optimally engaging hippocampal networks. We suggest that an experimental task, Associative Reinstatement Memory(ARM), may address these limitations. In this study, we demonstrate that ARM is poorer in PD relative to controls and is correlated with verbal memory, but not with executive functioning in PD. Using fMRI, we show that ARM-related hippocampal activation is reduced in PD and covaries with performance. To conclude, ARM is a sensitive and specific measure of hippocampal function in PD. Our study highlights the benefit of integrating cognitive neuroscience frameworks to improve the practice of clinical neuropsychology.

**A-0769 The ultimate role of the perirhinal cortex in familiarity: a novel hypothesis**

Gabriel Besson, Christine Bastin
Cyclotron Research Center, University of Liege, Belgium

Neurocognitive investigations indicate a clear implication of the perirhinal cortex (PRC) in familiarity (i.e. acontextual sense of prior exposure). Yet, the nature of this implication remains unknown. Recent evidence in perception showed that PRC is viewpoint-invariant and critical to discriminate resembling items. Here, we propose the novel hypothesis that PRC, ultimately representing the entity-level, supplies through its processing fluency (i.e. ease with which processing occurs, known to be enhanced when processing reoccurs) the major, even if not unique, contribution to familiarity. This original hypothesis would explain long-lasting discrepancies regarding the nature of PRC and fluency contributions in familiarity, prescribing new ways to probe it and promising new insights on the onset of Alzheimer's Disease whose neuropathology starts in PRC.

# Keynote session IX

**K9 session**

Thursday, 21 July 2016 | 17:40 - 18:25 | Room 1

**Chair/Organizer: Barbara Knowlton**

**A-1074 KEYNOTE LECTURE: Benefits from Poor Attention Regulation**

Lynn Hasher
University of Toronto

Attention regulation plays a critical role in performance on a wide range of cognitive tasks. When it is efficient, as is frequently the case for healthy young adults, it permits rapid learning and accurate retrieval of goal - relevant information. When attention regulation is not efficient, as is frequently so for older adults (and for young adults tested at off peak times of day), performance patterns are quite different and non-goal relevant information (i.e., distraction) will play a larger role than is otherwise the case. Distraction is a double - edged sword when cognitive control is reduced: It can be disruptive, slowing responses, increasing errors, reducing retrieval. Distraction can also be facilitative, resulting in greater learning of information (including both relevant targets and irrelevant distraction), greater binding of information, and, perhaps most surprisingly, less forgetting. This talk will focus on the benefits of reduced control over attention, using healthy aging as a model with some evidence from young adults operating at off peak times of day and others induced to be in a good mood.

# Keynote session X

**K10 session**

Friday, 22 July 2016 | 08:30 - 09:20 | Room 1

**Chair/Organizer: Lynn Nadel**

**A-1011 KEYNOTE LECTURE: Mental time travelling about memory neuroscience - what's new since ICOM5?**

Eleanor A. Maguire

Wellcome Trust Centre for Neuroimaging, University College London, UK

From ultra-high field neuroimaging in humans, to optogenetics and intracellular recordings in awake behaving animals, the five years since ICOM5 continued to see dramatic developments in memory neuroscience. Focusing in particular on humans, in this talk I will consider whether these advanced approaches have hastened answers to long-standing questions in the field, if in fact we are asking the right questions, and whether we need to take a new perspective on how memories are instantiated in the brain. Using cognitive, neuropsychological and brain imaging data, I will try to account for the increasing number of reports of traditional 'memory' brain regions being vital for functions such as perception, different modes of thinking, problem-solving and decision making. Further, recent high resolution structural and functional MRI data will demonstrate how the underlying processes and mechanisms involved are now tractable in vivo in humans. Overall, this work will illustrate the connected nature of cognition and reveal how its wheels may be oiled by processes in the hippocampus.

# Ageing and neuropsychology of memory II

**I152 session**

Friday, 22 July 2016 | 09:30 - 11:30 | Room 1

**Chair/Organizer: Jennifer Ryan**

**A-0629 Specific alterations of thalamic nuclei in alcoholics with and without Korsakoff's syndrome: a Diffusion Tensor Imaging (DTI) investigation**

Shailendra Segobin [1], Ludivine Ritz [1], Coralie Lannuzel [1], Celine Boudehent [1,2], Francois Vabret [1,2], Francis Eustache [1], Helene Beaunieux [1], Anne-Lise Pitel [1]

[1] Inserm-EPHE-Université de Caen Normandie UMR_S 1077, Caen, France. [2] Service d'addictologie, UMR_S 1077, Centre Hospitalier Universitaire de Caen, Caen, France.

The thalamus is a relay organ shared between the frontocerebellar circuit (FCC) and the Papez circuit (PC), both being particularly affected in alcoholism. We used DTI and volumetric MRI to examine how thalamic nuclei connected to key regions of the FCC and PC are altered in terms of volume and connectivity in alcoholics with and without Korsakoff's syndrome. Our findings suggest two different mechanisms affecting the thalamus, depending on the connections of the nuclei to the FCC or PC. The first involves atrophy of the nuclei connected to the prefrontal area as the leading factor. The second is dictated by disconnection of the nuclei connected to the hippocampus. Correlations with neuropsychological scores were also carried out and will be discussed.

**A-0678 Associative memory errors formation in deaf people**

Joanna Ulatowska [1], Justyna Olszewska [2], Tomasz Rogowski [2]

[1] Institute of Applied Psychology, Maria Grzegorzewska University, Warsaw, Poland [2] University of Social Sciences and Humanities

The Deese/Roediger-McDermott paradigm is well established procedure of testing associative memory errors. Most studies use visual or auditory version of the procedure and examine participants whose phonological processing is not impaired. In the current study, however, we tested deaf participants who encoded either written words or their equivalents in sign language. Although it has been previously revealed that auditory deprivation does not generally seem to enhance visual perception, it does alter the morphology of the brain and its functional organization. Therefore, it was hypothesized that the difference in spreading activation would be significant not only between deaf and hearing individuals but also between these two formats of encoding. The results are discussed in the framework of distinctiveness heuristic.

**A-0683 Breaking down unitization: Is the whole greater than the sum of its parts?**

Maria C. D'Angelo [1], Alix Noly-Gandon [1], Arber Kacollja [1], Morgan D. Barense [1,2], Jennifer D. Ryan [1,2]

[1] Rotman Research Institute, Baycrest, Toronto, Canada; [2] University of Toronto, Toronto, Canadarn

Relational memory impairments are often observed in older adults, who have difficulty linking disparate elements. We have recently shown that unitization can mitigate impaired relational learning in the Transverse Patterning task in both amnesia and healthy aging. This unitization strategy is comprised of three component processes: (1) fusion, (2) motion, and (3) comprehension of action/consequence sequences. We examine which of these components are necessary and sufficient to mitigate age-related impairments. Healthy older adults showed equivalent impairments under standard training instructions across groups both immediately and following an hour delay. Only participants given unitization and action/consequence-only strategies showed improved performance following the 1-hour delay. Therefore, comprehension of action/consequence interactions is both necessary and sufficient to mitigate age-related relational memory impairments.

**A-0694 Using Discrepancy Analysis to characterize collaborative memory of older adults with and without very mild dementia**

Thomas Morris [1], Amanda J. Barnier[1], David Balota[2], Janet Duchek[2], Celia Harris[1]

[1] Macquarie University, New South Wales, Australia [2] Washington University, Missouri, USA

In collaborative recall, group performance typically is characterized by comparing the nominal sum of people tested alone to the total sum of people tested together. This method assumes similar levels of ability across group members and may mask instances of collaborative facilitation, especially in groups with asymmetrical abilities. In contrast, Discrepancy Analysis (DA) characterizes group performance as the differences between collaborating partners both before and during collaboration. This paper applies DA to the collaborative performance of 20 men and women with very mild dementia (Clinical Dementia Rating of 0.5) and their healthy spouses who were asked to learn and remember categorized word lists both alone and together. Results demonstrated underlying benefits of collaboration not identified by conventional analyses.

**A-0695 Did that just happen again? Adult memory for repeated events**

Celine van Golde, Helen Paterson, Annabel Marsh

University of Sydney, Sydney, Australia

Eyewitness research has historically focused on memories for one-off events, however many incidents can be ongoing (e.g. bullying, domestic violence, sexual abuse). While there is an abundance of research on children's memories for repeated events, similar research with adults is sparse. In our study adult participants watched four separate videos of bullying over a 4 week time period. Witnesses in the experimental condition were asked to record their account immediately after viewing each video; witnesses in the control condition did not complete this task. One month after the initial video presentation, all participants were questioned about the four incidents. Completeness and accuracy of their recall were assessed. Results will be discussed in terms of their practical and theoretical implications.

**A-0776 Synaesthesia is protective of memory decline in older age**

Andy D Mealor, Julia Simner, Farrah Sow, Jamie Ward

University of Sussex

Grapheme-colour synaesthetes experience sensations of colour in the presence of letters or numbers, and have improved memory relative to matched controls. We tested whether this memory advantage is maintained in older age. In two studies we compared older (mean age: 65) and younger synaesthetes (mean age: 23) and controls on a visual associative memory task and an old/new recognition task for items from different modalities (digits, images, music). In both studies, we found independent benefits of synaesthesia and youth on performance. Furthermore, the performance of older synaesthetes was comparable to that of younger controls. Thus, we contend that synaesthetes in their sixties may have similar memory function to non-synaesthetes in their twenties.

# Collective memory/social II

**I052 session**
Friday, 22 July 2016 | 09:30 - 11:30 | Room 2
**Chair/Organizer: Shamsul Haque**

**A-0531 Life script semantic knowledge about familiar and unfamiliar cultures**
Shamsul Haque [1], Aris Safree [2]
[1] Monash University Malaysia, Bandar Sunway, Malaysia; [2] Universiti Malaysia Terengganu, Malaysia
Three groups of college students estimated timing for the ten most important events likely to occur in an idealized life course specific to three cultures: their own, an unfamiliar human culture and a fictitious alien culture. Unexpectedly, significant cross-cultural similarities were observed in the event contents, and in the temporal distributions for the positive events, with typical reminiscence bumps. Similar bumps were also observed across cultures for work, relationship, socio-cultural and education related events. There was more of a consensus on the proposed ages for positive, rather than negative, events, which was reflected across cultures. It is suggested that participants utilized their own life script semantic knowledge to estimate timing for events in unfamiliar cultures, resulting in such cross-cultural similarities.

**A-0536 Social cognition and decision-making across the lifespan**
Daniel M. Bernstein [1], Daniel G. Derksen [1], Joshua A. Weller [2]
[1] Kwantlen Polytechnic University [2] Oregon State University
We completed year 1 (N = 176; Age Range = 3 to 89 years) of a 4-year longitudinal lifespan study of perspective-taking (hindsight bias, theory of mind), executive function (working memory, inhibitory control), and judgment / decision-making (sunk-cost fallacy, risky decision making, peak-end rule). Participants completed the identical tasks wherever possible. Otherwise, participants completed age-appropriate versions of the task (e.g., Stroop). Results: Few measures correlated with each other. Age predicted performance on most tasks; however, many of these age effects were quadratic in that younger children and older adults performed differently from, but not always worse than, older children and younger adults. Our results illustrate the complex nature of cognition across the lifespan.

**A-0546 The transmission of embodied memories and skills as effect of social interaction**
Lucas Bietti, Adrian Bangerter
University of Neuchatel
In order to tackle some of these issues that create the conditions for the spreading of memories and skills across different individuals and social groups during face-to-face social interactions, we conducted an experimental study. The experiment consisted of a study of the serial reproduction of memories and performances collected in a joint complex task under different conditions and across transmission chains. Transmission chains were interactive and video-recorded in order to see and understand better the embodied features of informational transfer. Our preliminary findings suggest that memories became conventionalized (e.g. gradual loss of embodied features) as they move away from the original event within the communication chains. Such conventionalization affected task performance in the joint task.

**A-0560 Exploring Cultural Memory through Photography: A Methodological Experimentation**
Yajing Liu
Nanyang Technological University, Singapore
The notion of cultural memory is developed and affected by the problems along with contemporary society, such as the heritage crisis. Previous research has explored cultural memory in humanities, social sciences, and literature to state, the discourse of cultural memory emerged to emphasize historical matters, our understanding of the past, and influences on the present. This presentation will explore cultural memory through the lens of photography, showing ways in which photographs figure importantly in cultural memory. I will begin with my photography project of the heritage village in China, to describe the experience, considerations, methods, and strategies in the exploration of cultural memory. I will also conclude by the role of photographs to understand social and cultural aspects of memory.

**A-0645 Do Life Scripts Inform Perceptions of National Development? A Cross-Cultural Comparison**
Travis G. Cyr, William Hirst
The New School for Social Research, New York City, USA
Is there a national analog to personal life scripts? Participants from the US, UK, and India listed events from the “life” of a “typical” nation or identified the five most important events in their own and another country’s history. Participants produce national life scripts, with certain events more likely to occur in a “typical” country than others. The scripts were culturally specific. National life scripts, in turn, guided participants’ recall of the history of both their own and the other country, with the effect weakest when non-US participants recalled US history. The findings are discussed in light of past work on social representations of history and the hegemony of Western history on the world stage.

**A-0693 A Cross-Cultural Investigation of Self and National Appraisals**
Martin M. Fagin, William Hirst
The New School for Social Research
Our memories often become skewed to create a positive representation of self. According to temporal self-appraisal theory (TSAT) individuals are more likely to disparage past selves so as to boost positive self-regard in the present. The groups we belong to can also serve to boost positive self-regard. The current study attempted to cross-culturally replicate previous self-appraisal findings, and to extend into the study of collective appraisals. Results indicated that in most nations self-appraisals were skewed in line with the expectations of TSAT. For national appraisals, more developed nations showed a “nostalgia effect,” while less developed nations show the opposite trend. Implications for representations of self and collectives we belong to are discussed.

**A-0735 The Lived Semantic and Distant Semantic distinction in the Collective Memory of Argentine Crisis of 2001**
Felipe Muller [1,2], Federico Bermejo [2]
[1] National Scientific and Technical Research Council (CONICET), Argentina; [2] Universidad de Belgrano, Buenos Aires, Argentina
Research on collective memory distinguishes lived semantic collective memories (LSCMs) from distant semantic collective memories (DSCMs). LSCMs are memories of historical events that people lived through. DSCMs are learned indirectly, through family stories, media, textbook, etc. For

different generations, the same event can be either a LSCM or a DSCM, suggesting that there might be qualitative mnemonic differences for the same event across generations, a version of the generational cohort effect. We tested this claim by studying Argentines' memories of the political, economic and social crisis of 2001. A total of 100 participants responded to free recall and cued recall tests. Narrative and statistical analysis revealed expected qualitative differences, accounting in part for different generational views of history.

**A-0972 Memory, identity, nostalgia (The possibilities and impossibilities of creating a post-totalitarian national identity)**

Beata Benczeova
Faculty of Arts, Comenius University, Bratislava, Slovakia

The article is based on the assumption that collective memory is the key to creating national identity and that it cannot be maintained institutionally, but rather through impulses and activities "from below". These methods include discussions initiated by the public or literature, which represent a juxtaposition of private narrations and petit histoire. The complexity of identity is concisely described in literary works of exiles from totalitarian regimes (e.g. Milan Kundera, Dubravka Ugresic, etc.), who are of crucial importance from the perspective of the goals of the article. The intention of the article is to outline and understand the issues of identity in post-socialist countries on the axis of memory – forgetting through the specific poetics of novels reflecting everydayness.

# Emotion and memory III

**I142 session**

Friday, 22 July 2016 | 09:30 - 11:30 | Room 3

**Chair/Organizer: Caitlin Hitchcock**

**A-0631 Why specific memories are important: The role of boundary conditions on the generalizability of negative self-beliefs**

Caitlin Hitchcock, Catrin Rees, Tim Dalgleish

[1] MRC Cognition and Brain Sciences Unit; [2] University of Cambridge

A wealth of research has demonstrated that impoverished access to specific autobiographical memories drives the onset and maintenance of affective disturbance. However, it is unclear exactly why specific memories are needed for stable emotional health. One intriguing possibility is that specific memories may define the boundaries within which generalized schemas about the self are applicable. To assess this hypothesis, groups of currently-, remitted- and never-depressed individuals completed a cued-recall task that involved recall of specific memories that were either consistent or inconsistent with schema-relevant generalisations. The data revealed important differences in the degree to which positive and negative schema-relevant generalisations are bounded by specific memories in healthy individuals versus those with a history of depression.

**A-0641 Integration of new information into emotional memories in humans**

Alison Montagrin [1,2,3], Athina Zafeiriou [2], David Sander [2,3], Ulrike Rimmele [1]

[1] Department of Fundamental Neurosciences, University of Geneva, Switzerland;[2] Department of Psychology, University of Geneva, Switzerland; [3] Swiss Center for Affective Sciences, University of Geneva, Switzerland

While it has been shown that neutral episodic memories in humans can be updated with new neutral information, here we test whether emotional episodic memory can be updated with new information of either emotional or neutral content. Replicating previous findings (Hupbach et al. 2007, 2008), we show that a subtle reminder triggers integration of neutral information into an existing neutral memory. Likewise a subtle reminder triggers integration of neutral information into an existing emotional memory. Crucially, similar to the updating a neutral memory (Hupbach et al. 2007, 2008), updating of emotional memories with neutral information requires a period of reconsolidation as it is not evident if participants are tested right after the reminder and learning of the second list.

**A-0673 Seeing you angry makes me suspicious: The role of emotion in memory conformity.**

Katarzyna Zawadzka [1], Magdalena Rychlowska [2], Laura Gambling [2], Maciej Hanczakowski [2]

[1] Nottingham Trent University, UK; [2] Cardiff University, UK

In this study we investigated whether the willingness to rely on other person's memory responses depends on the emotion that this person displays. Participants completed single-item recognition tests while being presented with external cues coming either from a 'happy' or an 'angry' source. When both sources were equally reliable, participants relied more on cues from the 'happy' source. When the 'angry' source was noticeably more reliable than the 'happy' one (75 vs. 50% correct), conformity depended on participants' ability to identify the better source. Those who failed at this task still relied more on cues from the 'happy' source. Only participants who later indicated correctly that the 'angry' source was more often correct conformed more to this source.

**A-0675 Trigger warnings worsen expectations but minimally affect PTSD-like symptoms**

Mevagh Sanson [1], Maryanne Garry [1], Deryn Strange [2]

[1] Victoria University of Wellington, Wellington, New Zealand; [2] John Jay College of Criminal Justice, New York, USA

Trigger warnings are cautionary instructions that summarise negative material a person is about to encounter and warn it might "trigger" symptoms associated with post-traumatic stress disorder (PTSD), such as involuntary memories of trauma. These increasingly common warnings are intended to help prevent such unpleasant symptoms, but there is reason to suspect they may instead produce them—perhaps by changing people's expectations about the material. We addressed this possibility by asking subjects what they expected the material to be like, having shown only some a trigger warning. We then showed them negative material, and measured their related involuntary memories. Our data suggest trigger warnings worsen people's expectations about the material, but have little effect on their PTSD-like symptoms.

**A-0679 A closer examination of episodic specificity in depression**

Sylvia Hach [1,2], Lynette J. Tippett [2,3], Donna Rose Addis [2,3]

[1] Unitec Institute of Technology, Auckland, New Zealand; [2] The University of Auckland, Auckland, New Zealand; [3] Brain Research New Zealand, New Zealand

Individuals with current or remitted depression exhibit reduced episodic specificity when remembering past and imagining future events. Despite this, individuals with depression can generate some specific events. It remains unknown, however, whether these specific events are comparable in quality to those generated by control participants. We used the Autobiographical Interview to analyse past and future event descriptions from a depression group and a matched control group. Relative to the control group, the depression group generated fewer internal (episodic) details, in particular event details, for past and future events. This was accompanied by an increase in external (non-episodic) details. Our findings suggest that even when individuals with depression generate specific autobiographical events, subtle differences in the quality of events persist.

# Face memory and Eyewitness II

**I132 session**

Friday, 22 July 2016 | 09:30 - 11:30 | Room 4

**Chair/Organizer: Philip A Higham**

**A-0738 From Prosopagnosia to Super-Recognition: Mapping the spectrum in face-memory with new societally-appropriate tests.**

Ashok Jansari [1], Emily Green [2], Hamza Tai [1], Ian Hannent [1]

[1] Goldsmiths, University of London, UK; [2] University of East London, London, UK

Passport officers can make 14% errors in face-matching (White et al, 2014) while some police-officers are found to be exceptional at recognising criminals with minimal information (Davis, Jansari & Lander, 2013). To map these individual differences seen in face-processing and to address the need for more societally-appropriate tests, we developed the Unfamiliar Face Memory Test (UFMT) and the Before They Were Adult (BTWA) test. The results of 647 participants demonstrated the sensitivity of the UFMT and those of 4162 demonstrated the sensitivity of the BTWA; further we found a significant correlation between the UFMT and the BTWA (r = .739, p

**A-0739 Automatically Guilty: Associations Between Evidence and Guilt**

William Crozier [1,2], Deryn Strange [1]

[1] John Jay College, CUNY, New York, USA [2] The Graduate Center, CUNY, New York, USA

We created a Deese-Roediger-McDermott word (DRM) list to test the hypothesis that some forms of forensic evidence spontaneously activate the concept “guilty.” We tested a 14-word list that generated false memories of “guilty” in 73% of participants. Then, we substituted different forms of evidence (Confession, DNA, Bitemark, Eyewitness) into the list, hypothesizing that false memory rates would vary in line with the perceptions of the evidence, creating a stronger (or weaker) association than the original list. Surprisingly, we found participants (N=699 across 3 samples) false alarmed to the critical lure “guilty” at consistently high rates (73-85%). Yet participants who saw “Confession” were more confident in their false memories. Implications for these findings, the paradigm, and future research directions are discussed.

**A-0844 Yes, I Can Recognize: Is My gender and Age Important for Eyewitness Testimony?**

Asheek Mohammad Shimul, Rimy Ahmed

University of Dhaka, Bangladesh

Purpose of the study is to investigate whether there is any effect of age and gender on eyewitness testimony. Forty four participants of three age groups took part in this experiment. Artificially constructed short video clips of stimulating crime were presented to the participants in lab. Immediate after presentation of the video clips, participants were shown six photographs with perpetrator present lineup for identification. Later on identification supporting questionnaire (victim’s details) appeared on the screen. Mann-Whitney U test and Chi Square tests revealed that there was no significant gender difference in correct identification of hijackers, but correct recall of supporting detail was found to be significantly different. There was no significant age effect in correct recall of supporting details.

**A-0895 Regulating eyewitness memory accuracy with multiple-option answers in interviews and questionnaires**

Philip A Higham

University of Southampton, Southampton, UK

People can regulate memory accuracy by offering plural- instead of single-option answers (plurality option). However, confidence ratings underestimate the large increase in accuracy that plural answers afford when options are explicit and finite (as with multiple-choice tests). In three experiments, we investigated confidence underestimation and variables that may moderate it. In each experiment, participants first viewed a videotape of a crime and then were either interviewed about the crime or completed a questionnaire. Underestimation was larger with interviews than questionnaires (Experiment 1). The underestimation with interviews was not solely due to visual availability of the answer options (Experiment 2), nor was it eliminated by using a binary confidence scale instead of 100-point scale (Experiment 3).

**A-0907 Memory Errors in Police Interviews: The Bait Question as a Source of Misinformation**

Timothy J. Luke [1], William Crozier [1,2], Deryn Strange [1]

[1] John Jay College, CUNY, New York, NY USA [2] The Graduate Center, CUNY, New York, NY USA

During an interrogation, police sometimes ask hypothetical “bait questions” about nonexistent incriminating evidence as a cue to detect deception. Here, we questioned whether those hypothetical questions can act as misinformation, producing a typical misinformation effect in jurors. In two experiments, participants (Study 1=100 mTurkers; Study 2=208 mTurkers) read a police report (Event Phase), watched an interrogation film with bait questions (Misinformation Phase), and then completed both forced-choice and source memory tests. We found that bait questions affected mock-jurors memories for the evidence, producing a large misinformation effect (ds>1.00) and causing participants to believe the hypothetical evidence existed. We discuss future research directions and real-world implications for this troubling interrogation tactic for jurors, interrogators, and suspects.

# Miscellaneous I

**I161 session**
Friday, 22 July 2016 | 09:30 - 11:30 | Room 5
**Chair/Organizer: Rosalind Potts**

**A-0004 Memory and Self in Kazuo Ishiguro's The Remains of The Day**
Assil GHARIRI [1], Khaldia BELKHEIR [2]
Tahri Mohamed University, Bechar, Algeria
This article studies the process of rewriting the self through memory in Kazuo Ishiguro's novels, The Remains of the Day. It argues that the presence or the absence of memory has a great impact on rewriting the self. It shows how the protagonist takes a journey through the unconscious to find his real self with the help of memory. The article coins the term of rewriting the self from Mark Freeman. It uses, also, Carl Jung's theory of individuation, concentrating on the idea of archetypes. The memory, in this article, is discussed as one of the great abilities of mind, without which people's lives will become a tremendous chaos and the reality of their selves would eternally remain lost.

**A-0005 The optimist view of the colors of 'the dress'**
Bodil S. A. Karlsson, Magnus K. G. Bergquist, Carl Martin Allwood

Judgments of answerability are related to optimism. When the blue/black or white/gold dress photograph, with remarkable color perception differences, went viral, we asked 183 participants, shown the photograph, what colors they perceived and afterwards what they considered the right answer. Optimists that had not seen the picture more often chose "there is no right answer". 46 participants didn't believe their perceived color was right. Judging a photograph is an event per se and represents another event. Can people who recall autobiographical memories of an occurred event have accurate autobiographical memories, but still consider their memory experience not veridical? Can this be due to different interpretations of what the remembered "event" is and to features of optimists' belief updating?

**A-0008 Sociopsychological effects in language forgetting/attrition; the case of Russian in Hungary**
Szilvia Bátyi [1 2], Kees de Bot [1 2]
[1] University of Pannonia, Veszprém, Hungary, [2] Transcarpathian Hungarian College named after Rákóczi Ferenc II, Beregovo, Ukrainern[1] University of Groningen, the Netherlands, [2] University of Pannonia, Veszprém, Hungary
There is a general assumption that not using a language leads to loss of linguistic skills. This 'use it or lose it' assumption has recently come under critique. A number of studies have shown that many of the factors that play a role in L2 acquisition like attitude, motivation, etc. also have an effect in language attrition. In this study we looked at the impact of attitudes towards Russian and Russians by people who had to learn the language as a mandatory subject. Lexical skills were tested on two levels: recall and recognition. The findings show that a positive attitude was not necessary to maintain skills in an L2, but that they do play a role.

**A-0035 Mimicry manipulations affect performance on cognitive tasks**
Katinka Dijkstra , Marjet Kalkman-Blankenberg
Erasmus University Rotterdam, the Netherlands
If someone tells an emotional experience, we tend to mimic the emotional expressions on this person's face. The possibility of expressing emotions on the face or not has been found to affect recognition memory (e.g., Niedenthal, Brauer, Halberstadt, & Innes-Ker, 2001). We examined effects of facial expression manipulations on offline memory tasks. Participants watched videos that elicited different emotions under mimicry prevented or mimicry possible conditions. The results indicated that the mimicry possible condition yielded better retention for affective information (Experiment 1) and better memory performance regarding the video evoking disgust (Experiment 2) than the mimicry prevented condition. Being able to simulate emotions through facial expression seems to facilitate understanding of and subsequent memory for emotional information.

**A-0322 Explicit and implicit memory in evaluative conditioning: an investigation of metacognitive judgements about memory.**
Laurent Waroquier [1], Marlène Abadie [2], Zoltan Dienes [3]
[1] Université Clermont Auvergne, Université Blaise Pascal, Clermont-Ferrand, France [2] Université de Fribourg, Suisse [4] University of Sussex, Falmer, United Kingdom
Evaluative conditioning refers to a change in liking of a conditioned stimuli consecutive to its repeated pairing with a valent stimuli. We adapted the knowledge attributions method (Dienes & Scott, 2005) to investigate the role of implicit and explicit memory of the pairings. This method is based on the phenomenological experience of the participants while performing the recognition test. More specifically, on each trial of this test, participants made a metacognitive judgement about the basis of their response. Memory, intuition, and familiarity and guess attributions were distinguished. We obtained evaluative conditioning for memory and feeling based attributions. These results suggest that both implicit and explicit memory play a role in evaluative conditioning.

**A-0685 Optimizing real world learning: the Memrise Prize**
Rosalind Potts [1], David R Shanks [1], Ed Cooke [2], Ben Whately [2]
[1] University College London, UK; [2] Memrise, London, UK
We report outcomes from the Memrise Prize, an international optimal learning research competition launched in collaboration with online learning company memrise.com. In Phase 1, research groups were tasked with devising a study regime for learning 80 Lithuanian-English word pairs such as to optimise recall in a final test a week later. Competitors tested their solutions in their own laboratories against a baseline task that we provided. The top five solutions were selected to be implemented on the Memrise platform and compete against each other in Phase 2, with Memrise users as participants. While distinctly different, successful methods shared several key features. In addition to final scores, we collected metamemory, effectiveness and enjoyment ratings, exploring relationships between these and test performance.

**A-0559 Autobiographical Recollections of Repeated Events: A Longitudinal Assessment**
Berivan Ece [1], Sami Gulgoz [2]
[1] MEF University [2] Koç University
We investigated autobiographical memory processes for repeated life events longitudinally. A sample of 38 (18 females; Mage = 21.71; SD = 3.08)

dancers, who experience similar events (competitions) repeatedly, completed autobiographical memory questionnaires following competitions in 2014 and 2015. In both cases, they responded to questions about their dance history and the competition. They further rated event qualities such as importance, emotional valence and intensity, vividness, distinctiveness, typicality, rehearsal, confidence, and perspective. Results revealed that some event qualities were relatively vulnerable to the effects of repetition and time whereas others were resistant. We discuss these findings with an approach aiming to specify the components of self-in-action scripts and the differential effects of time and repetition on event representations.

# Memory in the 'Real World': Factors influencing memory in forensic settings

**S0057 session**
Friday, 22 July 2016 | 12:00 - 14:00 | Room 1
**Chair/Organizer: Julie Gawrylowicz**
**Discussant: Lorraine Hope**

**A-0964 Memory and the Operational Witness**
Lorraine Hope [1], Fiona Gabbert [2]
[1] University of Portsmouth, [2] Goldsmiths, University of London
Investigations following critical events often depend on accurate and detailed recall accounts from operational witnesses (e.g., police, military personnel, emergency responders). However, the challenging nature of such events, together with the cognitive demands imposed on operational witnesses as a function of their active role, may impair subsequent recall. Across three studies manipulating response role, exertion and team recall conditions, we examined the memory performance of officers for simulated live scenarios involving armed perpetrators. Police responders displayed heart rate activity consistent with increased stress response and typically reported significantly fewer correct details about the incidents than officers in control conditions. Findings highlight the need to consider both the impact of operational involvement and stress-related effects on memory in dynamic applied environments.

**A-0965 Alcohol protects memory against negative effects of misleading post-event information.**
Julie Gawrylowicz, Anne Ridley, Ian Albery
London South Bank University
The current study examined whether alcohol consumption after having witnessed a crime can make individuals less suggestible to misleading post-event information (PEI). Participants watched a simulated crime video. Thereafter, one-third of the participants expected alcohol and received alcohol (alcohol group), one-third did not expect alcohol but received alcohol (reverse placebo) and one-third did not expect alcohol and received no alcohol (control). After 1-hour absorption, participants were exposed to misinformation embedded in a written narrative about the simulated crime. Finally, participants completed a cued- recall questionnaire about the event one day later. The proposed study is the first to find that alcohol can have beneficial effects on eyewitness memory by protecting against misleading PEI. Theoretical and applied implications are discussed.

**A-0966 The effects of alcohol and alcohol expectancies on the development of intrusive cognition for trauma**
Melanie Takarangi [1], Heather Flowe[2], Ella Moeck[1], Joyce Humphries[3]
[1] Flinders University; [2] Loughborough University; [3] Edge Hill University
Intrusive cognition is a hallmark symptom of Post-Traumatic Stress Disorder (PTSD). Research examining how alcohol consumption affects intrusive cognition is limited. We examined the psychological and physiological effects of alcohol on intrusive memories of a sexual assault scenario. Subjects were allocated to a placebo, low or high dose condition, and received true or false information about their beverage content. We monitored intrusive symptoms immediately after analogue trauma exposure and either 24 hours, or one week, later. People who believed they had consumed alcohol reported more intrusive symptoms, regardless of actual beverage content. Our data point to the important role of alcohol expectancies, and have theoretical implications for PTSD development among sexual assault victims in cases where alcohol is involved.

**A-0967 The effects of acute alcohol intoxication during encoding on memory for a sexual assault scenario**
Heather Flowe [1], Melanie K.T. Takarangi [2], Nilda Karoğlu [3], Kasia Zelek [4]
[1] Loughborough University; [2] Flinders University; [3] Kent University;[4] University of Leicester
We studied the effects of acute alcohol intoxication and alcohol expectancy on remembering in the context of sexual assault. Across a series of studies, women were randomly assigned to consume an alcoholic (dosed to achieve a 0.08% BAC) or a placebo beverage, and alcohol expectancy was controlled. They participated in an interactive hypothetical sexual assault scenario, and 7 days later, their memory recall for the event was tested with the Cognitive Interview or the Self-Administered Interview, followed by a recognition test. Participants were exposed to misleading, consistent, and neutral information about the scenario prior to recall. Intoxicated participants recalled the scenario as accurately than their sober counterparts, but their recognition performance was poorer.

**A-0968 Was that how it happened? Exploring the effects of co-witness discussion on metamemory.**
Joanne Rechdan [1,2], Lorraine Hope [1], Melanie Sauerland [2], James Ost [1]
[1] University of Portsmouth; [2] Maastricht University
Previous research has examined how co-witness discussion alters the accuracy of eyewitness reports, but not how discussion affects metacognitive mechanisms that dictate the quantity (number of questions attempted) and quality (level of detail) of memory reports. In Experiment I (N= 92), we examined the effect of receiving confirming or disconfirming feedback from a co-witness on memory reports. Participants receiving disconfirming feedback (cf. confirming or no feedback) provided fewer fine-grained answers on a subsequent recall questionnaire. In Experiment II, (N=60) participants viewed a crime video and answered questions about it, either immediately or following a discussion with a co-witness who had seen a different version. Analyses will explore the effects of co-witness discussion on the quantity and quality of recall reports.

**A-0969 Facilitating Retrieval Through Use of Self-Generated Cues**
Rebecca Wheeler [1], Fiona Gabbert [1], Lorraine Hope [2], Siân Jones [1], Tim Valentine [1]
[1] Goldsmiths, University of London; [2] University of Portsmouth
Associative Network models of memory suggest the quality of overlap between encoded information and retrieval cue predicts the likelihood of successful retrieval. This work demonstrates that self-generated cues increase recall, without cost to accuracy, compared to cues generated by another witness, or free recall alone. Participants witnessed a live event, before completing a free recall task. Retrieval strategies varied by condition, with three self-generated cue techniques utilised; keywords, a timeline, and concept map. Self-generated cues improved performance on the free recall task. In addition, different self-generated cue techniques elicited different types of information (person, action, setting details). Self-generated cue techniques could be utilised strategically prior to a full interview to aid the retrieval of details most pertinent to the investigation.

**A-0970 Enhancing the quality of investigative interviews using a novel Structured Interview Protocol**
Fiona Gabbert [1], Lorraine Hope [2], David La Rooy [3], Rebecca Milne [2], Tom Ellis [2]

[1] Goldsmiths University of London; [2] University of Portsmouth; [3] Royal Holloway, University of London

There is a need for new and effective evidence-based interview procedures and techniques that complement national guidelines on the collection of evidence, whilst also increasing the efficiency of obtaining evidence, and enhancing the quality of evidence obtained. In response the 'Structured Interview Protocol' (SIP) has been developed and tested in a randomised controlled trial. The protocol draws upon relevant memory theory and principles of memory, current psychological theory on the strategic control of memory reporting, and cutting-edge psychological developments in investigative interviewing research. Results indicate that the SIP promotes high quality, effective interview performance via skilled use of rapid rapport techniques, enhanced ‘engage and explain’ skills, and a clear increase in appropriate question types used in a structured manner.

# I remember it now, but not a day later: Accelerated long-term forgetting

**S0051 session**

Friday, 22 July 2016 | 12:00 - 14:00 | Room 2

**Chair/Organizer: Suncica Sunny Lah, Laurie Miller**

**A-0589 Forgetting in temporal lobe epilepsy: when and why?**

Anneli Cassel [1], Robin Morris [1], Michael Koutroumanidis [2], Michael Kopelman [1]

[1] King's College London, UK; [2] Guy's and St Thomas's NHS Foundation Trust, UK

Eighteen participants with temporal lobe epilepsy (TLE) and 18 matched controls performed two novel experimental tasks measuring long-term forgetting of verbal and visuospatial material at delays between 30 seconds and a week. Forgetting of verbal material was found to be progressively faster during the course of a week in the TLE group. On visuospatial memory, the TLE group showed faster forgetting during the first 10 minutes after learning, as indicated by planned comparisons, with parallel forgetting rates thereafter. Individual differences in the pattern of forgetting were related to a number of clinical factors. Our findings provide evidence for two patterns of disruption to early memory consolidation in this population, either occurring over the initial delays only or continuing progressively thereafter.

**A-0591 Accelerated long-term forgetting in children with epilepsy: Does temporal lobe focus matter?**

Michael Gascoigne [1,2], Richard Webster [3], Belinda Barton [4], Deepak Gill [3], Mary Lou Smith [5], Jayne Antony [3], Suncica Sunny Lah [1 6]

[1] School of Psychology, The University of Sydney, NSW 2006, Australia; [2] Australian College of Applied Psychology, Sydney, NSW 2000, Australia; [3] Department of Neurology, The Children's Hospital at Westmead, Sydney, Australia; [4] Children's Hospital Education Research Institute, The Children's Hospital at Westmead, Sydney, Australia; [5] University of Toronto Mississauga and Hospital for Sick Children, Toronto, Canada; [6] ARC Centre of Excellence in Cognition and its Disorders, Australia

This study examined long-term memory formation in 23 children with temporal lobe epilepsy (TLE), 20 children with idiopathic generalised epilepsy (IGE) and 58 controls. Participants completed two learning tasks (verbal list and spatial-location) which both involved recall after short (2-min, 30-min) and long (7-day) delays. Two-way ANCOVA revealed an interaction (p

**A-0594 Accelerated long-term forgetting in children: Are seizures really needed?**

Suncica Sunny Lah [1 2], Jasmin Grayson-Collins [1], Louise Parry [3], Carly Black [1], Chloe Gott [1], Belinda Barton [4], Richard Webster [5], Deepak Gill [5], Adrienne Epps [6], Michael B. Gascoigne [1 7]

[1] School of Psychology, University of Sydney, NSW 2006, Australia; [2] ARC Centre of Excellence in Cognition and its Disorders, Australia; [3] Brain Injury Rehabilitation Program Sydney Children's Hospital and Department of Psychology, Sydney Children's Hospital Randwick, Sydney, NSW 2031, Australia; [4] Children's Hospital Education Research Institute, The Children's Hospital at Westmead, Sydney, NSW 2145, Australia, [5] Department of Neurology, The Children's Hospital at Westmead, NSW 2145, Sydney, Australia; [6] Brain Injury Rehabilitation Program and Department of Psychology, Sydney Children's Hospital Randwick, Sydney, NSW 2031, Australia; [7] Australian College of Applied Psychology, Sydney, NSW 2000, Australiarn

Accelerated long-term forgetting (ALF) has mainly been investigated in patients with epilepsy and often attributed to seizures. To examine whether seizures are necessary for ALF we have conducted a set of studies. The first, cross-sectional study, included patients who have never experienced seizures: children with traumatic brain injury (TBI). The second, longitudinal study, involved children with idiopathic generalised epilepsy (IGE) whose seizures subsided over time. Compared to healthy control children, ALF was found at 7 days in children with TBI who have never experienced seizures as well as in children with epilepsy on follow-up, when their seizures subsided. Our findings suggest that seizures may not be necessary for ALF, which may be more prevalent than expected.

**A-0696 Sleep and memory consolidation in accelerated long-term forgetting due to transient epileptic amnesia**

Christopher Butler [1], Kathryn Atherton [2], Kia Nobre [3], Adam Zeman [4]

[1] Nuffield Department of Clinical Neurosciences, University of Oxford, UK; [2] Nuffield Department of Clinical Neurosciences, University of Oxford, UK; [3] Department of Experimental Psychology, University of Oxford, UK, [4] Department of Neurology, University of Exeter, UK

It has been hypothesised that accelerated long-term forgetting (ALF) is due to abnormal sleep-related memory consolidation. We have investigated this hypothesis in a series of experiments conducted in patients with transient epileptic amnesia, a form of epilepsy closely associated with ALF. In these patients, ALF emerges over wakeful intervals of 3 hours indicating that sleep is not necessary for ALF. Indeed, the overall benefit of sleep for memory retention is equivalent in patients and controls. However, we detect a clear difference in the relationship between slow wave sleep (SWS, the sleep phase associated with active memory consolidation) and subsequent recall, suggesting that, in contrast to its role in health, SWS is deleterious for memory in patients with ALF.

**A-0701 Remote memory impairment and accelerated long-term forgetting without transient memory disturbance: A variant of epileptic amnesic syndrome**

Greg Savage [1,2], Adam Zeman [1 3], Samrah Ahmed [4], Amy Gorsuch [4], Vana Webster [1], Jessica Hofmann [1], Christopher Butler [1,4]

[1] ARC Centre of Excellence in Cognition and its Disorders, Australia; [2] Department of Psychology, Macquarie University, Sydney, Australia; [3] University of Exeter Medical School, UK; [4] Nuffield Department of Clinical Neurosciences, University of Oxford, UK

The 'Epileptic Amnesic Syndrome' highlights the coexistence of transient memory disturbance, subtle seizures, and interictal anterograde/retrograde amnesia. Previously described in middle-aged and older adults, the syndrome overlaps with transient epileptic amnesia. We report objective memory data on seven predominantly young cases with self-reported remote memory impairment (RMI) and accelerated long-term forgetting (ALF). All presented initially with longstanding autobiographical memory difficulties and epilepsy only came to light subsequently. Transient amnesic episodes were not a feature. RMI was quantified using the Autobiographical Interview and autobiographical fluency measures. ALF was probed using tests of paired associate recall after 30 minutes, 1 day, 4 days, and 1 month. Our data demonstrate that profound autobiographical amnesia can be the presenting feature of otherwise inconspicuous epilepsy

**A-0702 Accelerated long-term forgetting of real-life events**

Nils Muhlert

School of Psychological Sciences, University of Manchester, Manchester, UK

In this talk I will discuss studies examining forgetting of real-life events in people with temporal lobe epilepsy (TLE). In each study, everyday events were captured using an automatic, wearable camera, the SenseCam. People with epilepsy and healthy controls wore the camera to a set event.

Their memories for those images were then assessed after varying delays. In the first study we found that people with transient epileptic amnesia showed normal memory for the event on the same day, but increased forgetting from the following day onwards. We later examined the patterns of neural activity seen when people with TLE retrieve these everyday memories. Last, I discuss an ongoing trial which aims to ameliorate accelerated forgetting in people with TLE.

**A-0703 Attempting to capture accelerated long-term forgetting (ALF) within one clinical visit: Towards a new assessment of ALF**

Ashok Jansari [1], Terry McGibbon [2], Micia Sanghera [1], Chenelle Owen [1]
[1] Department of Psychology, Goldsmiths College, University of London, UK; [2] University of East London, London, UK;

In the clinical evaluation of ALF, a major practical problem is that current measures can only capture it at intervals of a day or longer. To address this, we describe the case of patient RY who had demonstrated significant forgetting within a day of learning information (Jansari et al, 2010). We developed a word-pair learning paradigm for which RY demonstrated ALF within one hour of having learnt information to 100% criterion. To evaluate the utility of the paradigm in a broader context, we then applied it to looking at Normal Age-Related Memory Loss (NARML) with the eventual aim of testing it with Mild Cognitive Impairment (MCI) and Subjective Cognitive Impairment (SCI).

**A-0704 Adding measures of ALF to a neuropsychological assessment: Not hard to do and worth the effort**

Laurie A. Miller [1,2], Emma Flanagan [3], Annu Mothakunnel [4], Zoe Thayer [1,2]
[1] ARC Centre of Excellence in Cognition and its Disorders, Australia; [2] Central Medical School, University of Sydney, Sydney, NSW 2006, Australia; [3] Norwich Medical School, University of East Anglia, Norwich, UK; [4] Neuroscience Research Australia, Sydney, NSW 2031

Research indicates that ALF (poor memory at long delays, but normal at 30 min) occurs in patients with epilepsy and thalamic lesions, but until recently, few normative scores were available for its detection in clinical practice. We determined cut-off scores for diagnosing ALF on several measures, including two list-learning tasks [Rey Auditory Verbal Learning; Aggie Figures] (Miller et al., 2015). When 50 patients with focal epilepsy performed the list-learning tasks with 30-min and 7-day delayed recalls, we found 12% showed ALF for the verbal material and 6% for the visual. These new norms for the detection of ALF facilitate the investigation of patients' complaints and the consideration of treatment options.

# The representation of serial order in working memory

**S0036 session**
Friday, 22 July 2016 | 12:00 - 14:00 | Room 3
**Chair/Organizer: Steve Majerus**
**Discussant: Mike Page**

**A-0285 A common representation of serial order in working memory and language production**
Simon Fischer-Baum
Rice University, USA
Producing items one at a time in order is critical in memory and language. The representations that underlie this ability must contain information about the identity and position of the items in the sequence. I will present a series of studies that use errors to investigate how position information is represented in different domains - verbal and nonverbal working memory, spelling, spoken production. Different cognitive domains appear to rely on similar mechanisms for representing position information - a system which represents item position as their distance from both the beginning and end of the sequence. I will discuss these results in light of current computational theories of immediate serial recall.

**A-0286 Representational similarity of models of serial order**
Kristjan Kalm, Dennis Norris
MRC Cognition & Brain Sciences Unit, Cambridge, UK
Models of serial order can be broadly categorised in terms of how they represent order information (positional, chaining, ordinal, etc.). Importantly, these representations can be used to make predictions about the similarity structure of neural activation patterns observed in fMRI. First, I will briefly discuss the methodology behind representational similarity analysis (RSA) and show how this approach can be used to compare models of serial order based on the way they represent order. Second, I will give an overview of a series of neuroimaging experiments which used RSA distinguish between models proposing different representations of serial order.

**A-0287 Effects of rhythm on memory for spoken sequences: A model and tests of its stimulus-driven mechanism**
Mark Hurlstone [1], Tom Hartley [2], Graham Hitch [2]
[1] University of Western Australia, Australia, [2] University of York, UK
We investigate the idea that temporal grouping effects are an emergent property of a general serial ordering mechanism based on a population of oscillators locally-sensitive to amplitude modulations on different temporal scales. Two experiments show that the effects of temporal grouping are independent of the predictability of the grouping pattern, consistent with the model's stimulus-driven mechanism and inconsistent with alternative accounts. The second experiment reports detailed and systematic differences in the recall of irregularly grouped sequences that are broadly consistent with predictions of the new model. We suggest that the bottom-up multi-scale population (BUMP) oscillator mechanism is a useful starting point for a general account of serial order in language processing more widely.

**A-0288 Explaining Serial Order Effects in Working Memory with the Feature Model**
Ian Neath, Andrew Gabel, Aimée Surprenant
Memorial University of Newfoundland, Canada
Subjects recalled different classes of stimuli in strict serial order while completing a secondary task such as concurrent articulation. Manipulations with stimulus sets from one class (e.g., short vs. long words) produced interactions with secondary tasks whereas manipulations with stimulus sets from a second class (e.g., high vs. low frequency) did not. Models of immediate serial recall usually explain the findings with the first class using a "decay offset by rehearsal" account, but these accounts cannot explain the results with the second stimulus class. In contrast, the Feature Model is able to explain all the findings using identical serial order mechanisms. Simulations with the Feature Model offers insight into the difference between the two classes of stimuli.

**A-0289 The link between numerical codes and serial position codes in working memory**
Steve Majerus [1], Klaus Oberauer [2]
[1] Université de Liège, Belgium [2] Universität Zürich, Switzerland
We provide evidence for a link between serial order coding in working memory and numerical domains. In a first experiment using a numerical order interference paradigm, participants maintained and recognized the serial order of word lists while performing an ordinal number judgment task or a phoneme detection task. Serial order recognition performance was specifically slowed in the numerical interference condition. In a second experiment participants learnt associations between words and digit numbers; these words were then presented in lists for immediate serial recall. We observed decreased recall performance when the words occurred in serial positions that violated the number with which they had been associated in the learning phase, suggesting shared representations for numbers and serial order coding.

**A-0290 Using spatialization to SPoARC up the conversation about order coding**
Alessandro Guida
Université de Rennes 2, France
Since van Dijck and Fias (2011) discovered a positional SNARC effect- the SPoARC (Spatial-Positional Association of Response Codes)- various experiments have shown that verbal items entering immediate memory are spatialized, defined as the addition of a spatial dimension that is not in the input (Abrahamse, van Dijck, Majerus, & Fias, 2014; Guida & Lavielle-Guida, 2014). I will present new data about the conditions under which spatialization seems to occur and propose that a consequence of spatialization is order coding in immediate memory.

**A-0291 The Mental Whiteboard Hypothesis on Serial Order in Working Memory**
Elger Abrahamse [1], Jean-Philippe van Dijck [1], Steve Majerus [2], Wim Fias [1]
[1] Universiteit Gent, Belgium; [2] Université de Liège, Belgium
Prominent models hold that serial order coding in working memory is achieved by binding items to-be-maintained to fixed position markers. These models account for various empirical observations and received some neuro-imaging support, but provide few specifications on the cognitive and/or neural nature of position markers. Here we hypothesize about a novel mechanism to substantiate the notion of serial position markers. (I) Position markers underlying serial coding in multi-item WM should be understood as coordinates within an internal, spatially defined system, (II) internal

spatial attention is involved in searching through the resulting serial order representation, and (III) retrieval corresponds to selection by spatial attention. We sketch available empirical support and discuss how the hypothesis may frame a broad range of observations.

# Perception – Memory / Music

**I101 session**
Friday, 22 July 2016 | 12:00 - 14:00 | Room 4
**Chair/Organizer: Steffen A. Herff**

**A-0108 Everlasting tunes: The number of intervening items does not disrupt memory for melody**
Steffen A. Herff, Kirk N. Olsen, Roger T. Dean
MARCS Institute for Brain, Behaviour and Development, Western Sydney University, Australia
The number of intervening items has a significant effect on memory in various modalities. Most memory domains show clear recognition decrements as the number of intervening items between first exposure and reoccurrence of a stimulus increases. Music, however, has been demonstrated to be a paradox when it comes to memory and behaves differently when compared to other stimuli. Here, we investigate how the number of intervening melodies influences melody recognition and familiarization. In a series of experiments using continuous recognition paradigms, we demonstrate that the number of intervening items does not influence melody recognition or familiarization. Results were replicated using different melody corpora and implicit/explicit measurements. A novel 'regenerative multiple representations' model is proposed to explain the findings.

**A-0109 How expertise influences the effect of divided attention on memory for melody**
Steffen A. Herff [1,2], Daniela Czernochowski [2,3]
[1] MARCS Institute for Brain, Behaviour and Development, Western Sydney University, Australiarn[2] Institut für Experimentelle Psychologie, Heinrich Heine Universität Düsseldorf, Germanyrn[3] Cognitive Science, Technische Universität Kaiserslautern, Germanyrn
Divided attention often decreases memory performance, whereas domain specific expertise increases it. Here, 111 participants, three expertise groups, and two attention conditions reveal how musical expertise shapes the influence of divided attention on memory for melodies. Musicians outperform Non-Musicians in a continuous melody recognition task. A decrease in absolute recognition performance was statistically identical in all groups when a divided attention condition introduced a digit-monitoring task. However, Musicians performed significantly better in the digit monitoring task than Non-Musicians. Findings provide insight into the interaction of expertise, attention and memory, and are discussed in the light of attentional resource models. An augmented resource model is suggested to explain the results, theorizing an asymmetrical, non-linear trade off between two simultaneous tasks.

**A-0316 Affordances from words and objects in memory and vision**
Ashley James Chapman [1], Andriy Myachykov [1,2]
[1] Northumbria University, Newcastle-upon-Tyne, UK; [2] National Research University Higher School of Economics, Moscow, Russia
Object perception automatically activates object affordances – motor programs associated with an items use (Gibson, 1979). Affordances are activated automatically during perception (e.g., Tucker & Ellis, 1998), but it remains unclear what role, if any, affordances play in the representation of items in memory. The present study examines the nature of temporarily formed memory representations for power, precision, and non-affording objects. Participants viewed and memorized objects (Experiment 1) or their names (Experiment 2) before completing two tasks: (1) a colour-change detection task, which measures encoding, and; (2) answering a verification question about the object's identity, which measures recall. Our findings suggest that objects' affordances affect representation during recall but not during encoding.

**A-0325 Testing the Perceptual Fluency Hypothesis through Inverted Pictures**
Meltem Karaca [1], Nilsu Atılgan [1 2], Miri Besken [1]
[1] Bilkent University, Ankara, Turkey; [2] University of Minnesota-Twin Cities, Minnesota, USA
Perceptual fluency hypothesis claims that easily-perceived items will receive higher memory predictions, despite the fact that perception does not typically enhance recall. In the current set of experiments, participants were asked to identify the names of upright and inverted pictures during encoding, followed by a free recall test. Experiment 1 used item-by-item judgments of learning (JOLs) and Experiment 2 used aggregate JOLs at the end of the list. Even though the identification latencies were longer for inverted pictures than upright pictures in both experiments, this perceptual disfluency difference only produced higher memory predictions for upright pictures for Experiment 2 and no significant recall difference across experiments. This reveals that objective perceptual fluency differences are not always reflected in memory predictions.

**A-0508 Auditory Distraction in a Memory Task: The Benefits of Between-sequence Semantic Similarity**
Maciej Hanczakowski [1], C. Philip Beaman [2], Dylan M. Jones [1]
[1] Cardiff University, UK; [2] University of Reading, UK
The between-sequence semantic similarity effect refers to the impairment in memory performance observed when visually presented words are accompanied by semantically related auditory distracters. In the present study, we consider the possibility that processing the relationship between target words and distracters may convey category information which could disambiguate category membership of to-be-remembered words, benefitting memory for these words at recall. We show that the between-sequence semantic similarity effect is reversed when multiple-category learning lists are presented for study and a category-cued recall test is administered. The results indicate not only that irrelevant speech distracters are routinely processed for meaning, but also that semantic information gleaned from this supposedly unattended stream is retained until recall of the memoranda is cued.

**A-0517 The temporal signature of dynamic memories**
Sebastian Michelmann [1], Howard Bowman [1,2], Simon Hanlsmayr [1]
[1] School of Psychology, University of Birmingham, Birmingham, UK; [2] Centre for Cognitive Neuroscience and Cognitive Systems and the School of Computing, University of Kent at Canterbury, Kent, UKrn
When we reinstate dynamic events (e.g. music or videos) from memory, rich representations unfold in front of our mind in a temporally structured manner. Little is known however about the mechanisms that guide the replay of neural patterns from our past. Using dynamic audio and video material and applying time sensitive multivariate pattern analysis in a high-density EEG study, we show that memory reinstatement is accompanied by a decrease of low frequency (8 Hz) power, which carries a temporal phase signature, specific to the individual stimulus content. Replay effects in the visual and auditory domain could be localized to sensory specific regions, which suggest low frequency phase to be a domain general mechanism that orchestrates dynamic memory replay in humans.

**A-0740 Unconscious plagiarism in music composition: Investigating the effects of elaboration on source confusion in music**

Miriam Rainsford[1], Matthew A. Palmer[1], Timothy J. Hollins[2], Nicholas J. Beeton[1], Garth Paine[3]
[1]University of Tasmania, [2]University of Plymouth, [3]Arizona State University

In verbal idea-generation tasks, unconscious plagiarism (misremembering another's idea as one's own) is increased by some types of elaboration (improving others' ideas) but not other types (imagery tasks with others' ideas). We show that both imagery and improvement increase unconscious plagiarism in music composition. In two experiments, expert and non-expert musicians generated brief melodies with a simulated computer partner. Some melodies were then elaborated by imagery or improvement. Following a delay (up to one week), participants generated new melodies and completed a recognition test. As in verbal tasks, improving others' ideas increased plagiarism. However, unlike verbal tasks, imagery also produced unconscious plagiarism. Expertise did not influence plagiarism. These results suggest musicians are more susceptible to unconscious plagiarism than previously thought.

# Miscellaneous II

**I162 session**
Friday, 22 July 2016 | 12:00 - 14:00 | Room 5
**Chair/Organizer: Bodil S.A. Karlsson**

**A-0062 Denial deflation effect appears when people intentionally lie about true memories**
Veronika Nourkova, Anna Ivanova
Lomonosov Moscow State University, Russian Federation
What happens when people intentionally retell a subjectively false episode as true or deny the reality of a true episode? 55 young adults were asked to narrate two fictitious and two authentic episodes from their past, one as if it was authentic and one as if it was false, respectively. A week, and a year, later, participants rated how confident they were that each event actually occurred. The main finding was that a significant minority of participants (17% a week later and 23% a year later) recalled their retold-as-if-false authentic event as false with scores 1-3 on a 7 point scale. We call this phenomenon the “denial deflation” effect. The related “fabrication deflation” effect (Polage, 2012, 2014) was replicated, too.

**A-0155 Olfactory Memory Assessment: Reliability, Validity and Shortcomings of a New Measure**
Hamid R Sohrabi [1,2,3], Michael Weinborn [2,3], Kaikai Shen [3], Ralph N Martins [1,2,3]
[1] Edith Cowan University, Joondalup, Western Australia, Australia; [2] University of Western Australia, Crawley, Western Australia, Australia; [3] McCusker Alzheimer's Research Foundation, Nedlands, Western Australia, Australia
Olfactory memory is a challenging research endeavour. However, the translational value of such research in detecting individuals at higher risk of Alzheimer’s disease (AD) is critical and potentially rewarding. We report data for a cohort from the Western Australian Memory Study (N=131; aged 40-88 years old). We have developed an olfactory memory measure to investigate the retrieval processes involved in olfaction. We found significant associations between olfactory measure, verbal and visual memory modalities. We examined our olfactory measure against brain glucose metabolism, a measure used in AD research, and found significant association between the two AD markers. Defining a well validated odour memory test can improve our understanding of olfactory memory and its associated problems in AD.

**A-0557 Experts recall domain-specific random material better than novices: A meta-analysis**
Giovanni Sala, Fernand Gobet
University of Liverpool, Liverpool, United Kingdom
The ability to recall domain-specific unstructured material (e.g., random chess positions) is a litmus test for theories of expert memory. Theories emphasising high-level memory structures or holistic processing predict no difference between experts and novices, because no large structure or whole are present in such material. By contrast, theories assuming chunks (small meaningful structures) predict a skill effect, because chunks might occur by chance even in scrambled material. This meta-analysis assessed the correlation between expertise and recall of unstructured material in several domains, including board games and music. We found a moderate but significant overall correlation (r = .420, p

**A-0657 Learning is better with the hands free: The effect of affordance on memory**
Léo Dutriaux [1,2], Valérie Gyselinck [1,2,3]
[1] Laboratoire Mémoire et Cognition, Institut de Psychologie, Université Paris Descartes, France [2] Centre de Psychiatrie et Neurosciences (CPN), Inserm UMR S894, France [3] IFSTTAR - LPC, Versailles, France
Embodied cognition claims that conceptual system share processing resources with sensorimotor systems (e.g. Barsalou, 1999). Consistently, numerous studies have shown that the processing of action-related concepts involves a motor simulation of the action (Fischer & Zwaan, 2008). Whereas those studies have clearly shown that the processing of such concepts result in a motor simulation, they did not show that this motor simulation has a role in the memory of action-related concept. In a series of experiment (see Dutriaux & Gyselinck, submitted), we showed that an interfering posture (the hands behind the back) decrease the memory of manipulable object, but not of nonmanipulable objects. It suggests that motor simulation participates to the conceptual representation of manipulable objects.

**A-0001 including Conjunction Faces in a Recognition Test Alters How Old Faces Are Recognized**
Mark Tippens Reinitz [1], Geoffrey R. Loftus [2]
[1] University of Puget Sound, Tacoma, USA; [2] University of Washington, Seattle, USA
Using a state-trace methodology we show that conjunction faces (combining features of separately studied faces) in recognition tests alter how old faces are recognized. Faces were studied for 1 sec each and then tested at varying durations; for each, participants made “old”/“new” and confidence ratings, and indicated whether recognition was based on features or familiarity. When conjunction faces were not included in the test we found that, given equal confidence, familiarity-based responses were more accurate than feature-based responses, supporting a multidimensional model where familiarity and features independently contribute to recognition. This feature/familiarity difference disappeared even for old faces when conjunction faces were included in the test, supporting a unidimensional model where only features contribute to recognition.

**A-0003 I can't believe what I saw: Non-believed memories of colors when judging ‘the dress’**
Bodil S.A. Karlsson
Department of Psychology, University of Gothenburg, BOX 500, 405 30 Göteborg, Sweden
Occasionally when facing a difficult question, people may wonder what the right answer is, and judge if it is possible for anyone to answer it right. When a photograph of ’the dress’ went viral some perceived the dress to be white/gold, others blue/black. This study investigated what colors participants perceived and what they considered the right answer. 69 participants were shown the photograph and were asked what colors they perceived and what colors the right answer was. Eleven participants perceived white/gold but believed the right answer was blue/black. Can people accurately recall an autobiographical memory of an event that has occured, but dismiss the memory since they do not believe it is in line with factual states of the world?