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## **Investigating the Effects of Negative Affect on Creativity**

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## NEGATIVE AFFECT AND CREATIVITY

### Abstract

Prominent research of creativity and affect has historically illuminated the relationship between positive affect and creativity, whereas little is known about the effects-influence of negative affect on creativity. The present study aimed to investigate how negative affect influenced creativity by using a divergent and convergent creativity task. A sample of 54 participants was recruited and randomly assigned to a negative or positive affect condition. Before performing the creativity tasks, participants were exposed to a stimulus which were meant to induce either positive or negative affect. Results shows no significant differences between the participants' performance on either of the tasks. The limitations of the study, it's contributions and the potential cause for the non-significant results are discussed thoroughly.

*Keywords:* Creativity, Affect, Cognition, problem-solving.

### Investigating the Effects of Negative Affect on Creativity

“Creativity is one of the key factors that drive civilizations forward” (Hennessey & Amabile, 2010, p.570). The world has drastically changed over the last few decades, and is not what is used to be. Human progress and the thriving of mankind has led to advancements in technology, medicine and other societal areas, which have changed the way we interact, live and work. These changes have also, created new challenges and demands for the individuals and organizations of the 21<sup>st</sup> century (Hoff & Öberg, 2015; Dekker & van der Veen, 2017; O’rourke & Williamson, 2002). Phenomena such as globalisation accounts for a wide variety of changes by expanding consumer’s access of purchase products and services through the internet, whilst at the same time enabling global competition between organizations. Organizations previously known for their high-quality products and uniqueness, are now challenged by actors situated in other parts of the world, that can provide similar services and products for a fraction of the price. These new threats and challenges, requires the modern organization to become more creative and flexible to adapt and stay competitive in an increasingly diverse market characterized by uncertainty (Gronning, 1997; Kenney & Florida, 1988; Nonaka, 2007). In the development of creative products and ideas organizations are dependent on their employees’ contributions to survive (Shalley, Zhou & Oldham, 2004). In an increasingly uncertain labor market, knowledge is one of the few competitive advantages organizations can acquire to stay ahead (Nonaka, 2007), thus, making gaining as much knowledge about creativity as possible, an incentive for both organizations as well as researchers.

Who is creative, what makes people creative and when does creativity thrive, are just some questions that creativity researchers are concerned with today. The answer to these questions may very well vary, depending on who’s asking, with respect to their disciplinary background and which level of the creativity spectra the question is aimed towards since the study of creativity is both multidisciplinary and multifaceted in nature (Hennessey & Amabile, 2010). Despite this, certain research trends have been more prominent than others, such as the creative person, group, process, and product (e.g., Barron & Harrington, 1981; Brophy, 2006; Feist, 1998; Fryer, 2006), leaving other areas quite uncharted in comparison. The knowledge, or rather, the potential knowledge that could be accumulated, depending on the epistemological disposition, in areas such as neurology, affect - emotion and cognition, have previously been constrained by technology. However, technological advancements during the last decade have made it possible to pursue these areas (Miller, 2007). While

## NEGATIVE AFFECT AND CREATIVITY

studies on creativity, cognition and affect have been conducted, the scholars tend to focus on positives affect on creativity leaving the angle of negative affect greatly understudied

Therefore, this study instead aims to investigate, and hopefully expand the understanding of negative affect on creativity. In the section below, I will introduce and review empirical evidence and theories about creativity, affect and surrounding factors influencing the two.

### **Creativity**

Creativity is often referred to as one of the many characteristics that distinguishes human beings from other life forms. The ability to create and express ourselves, in various areas such as science, arts and technology, are unique for human beings (Radel, Davranche, Fournier & Dietrich, 2015). However, what creativity is and what it means to be creative, is somewhat ambiguous within the scientific community, which potentially could stem from the multifaceted nature of the phenomena, making it a challenge to study and measure (Runco & Jaeger, 2012).

The study of creativity can be viewed as multi-layered and composed of different sub fields/themes. There are “narrow” themes, concerned with what parts of the brain that are essential for creativity (neurology), which cognitive processes interplay when a problem is solved or something is created (cognition), and who are creative (individual/personality). There are also “broader” fields concerned with creativity in groups, different cultures, societies and systems. The different fields do however interplay and overlap in the sense of the nature, nurture continuum (Hennessey & Amabile, 2010). Hennessey and Amabile (2010) believe that, for the creativity research to move forward, it needs to be approach on multiple levels, interdisciplinary, as opposed to only be concerned with single layered approaches toward creativity such as personality, the creative process and the creative group (e.g Barron & Harrington, 1981; Mednick, 1962). Despite the multifaceted nature of the phenomena, many scholars do however, tend to include the criteria of originality and effectiveness/usefulness in their various attempts to define creativity. While the criteria of originality and effectiveness have been discussed frequently since the mid 50’s (Barron,1955; Stein,1953), with a narrative that suggests that both originality and effectiveness are required for something to be deemed as creative. Other researchers have proposed that creativity may require more criteria such as surprise (Simonton,2012), or can be adequate with only one criteria (Runco & Jaeger, 2012). However, independent of which definition one chooses to apply, it’s crucial to not forget that creativity does not exist within a vacuum but is in many

## NEGATIVE AFFECT AND CREATIVITY

cases dependent or at least partly dependent the context, meaning it can be affected in a variety of ways. Creativity in organizations can for example, be influenced by the culture, the complexity of the working tasks and the work environment (e.g Hoff & Öberg, 2015; Ruyi et al., 2016). Despite this, individual characteristics such as how we think or, our cognitive abilities can be crucial for creativity (Shalley et al., 2004).

**Creative Thinking.** “Creative thinking occurs when a problem solver invents or discovers a novel solution to a problem “(Dow & Mayer, 2004, p. 389). Scholars who focuses on creativity and cognition often takes an interest in the underlying cognitive processes that are involved in the creative performance of developing original and effective ideas and solutions (Hennessey & Amabile, 2010; Yuan & Zhou, 2008). Dual process models of creative thinking suggest that creativity requires interplay between cognitive processes, type one thinking and type two thinking to develop original and effective ideas and solutions. The type one thinking being intuitive, fast and automatic while type two thinking are effortful and logical, both play a central role in the creative process by simultaneously testing and refining ideas. Divergent and convergent thinking are also mentioned when discussing creative thinking as processes of thoughts that collaborate in the manufacturing of creative ideas and solutions (Allen & Thomas, 2011; Guilford, 1956). Divergent thinking is more intuitive and involves generating creative ideas by examining many different paths where a single “correct” solution does not exist. Divergent thinking can for example be such thinking that an artist may express while creating a painting, where there are no correct nor incorrect ways to paint, the artist explores many different potential paths to arrive a solution. In contrast, convergent thinking is more logical and requires prior knowledge to reach a single correct solution. Despite convergent and divergent thinking interplaying separate means are often used to measure the two (Cropley, 2006; Guilford, 1967).

A common way to measure and study creativity is to use creative problem-solving and individual’s performance in creativity tasks. Some studies have for measured divergent thinking by looking towards participants’ idea output where ideas are assessed by their *originality* which is the ideas rareness, *fluency* which are the quantity of ideas produced, *flexibility* which refers to the different areas in which the idea spans and *elaboration*, or how detailed the idea is (Forthmann et al., 2016; Kudrowitz & Dippo, 2013). Convergent thinking has been measured by applying insight problems. Dow and Mayer (2004) describes insight as “the process of moving from not knowing how to solve a problem to knowing how to solve a problem” (p. 389). Insight problems are non-routine problems where creative thinking and insight is involved. A non-routine problem is a problem with a not yet known solution method

## NEGATIVE AFFECT AND CREATIVITY

to the solver, requiring the individual to invent one as opposed to routine problems where the solution method is known. Insight problems can be verbal, mathematical, spatial and a combination of verbal and spatial where each requires a separate problem solving strategy (Dow & Mayer, 2004). Insight problems can be used to assess individuals' judgement, scientific understanding and creativity on complex tasks (Barr, Pennycook, Stolz & Fugelsang, 2015). Studies that have focused on assessing convergent thinking by using insight problems do as opposed to idea generation tasks, only provides scores for correct answers (e.g. Danek, Wiley & Öllinger, 2016; Nielsen, Pickett & Simonton, 2008; Pennycook, Cheyne, Koehler, Fugelsang, 2016). Despite insight problems frequent usage of insight problems in creativity research, Beaty, Nusbaum and Silvia (2014), argues that little is known about how performance on insight problems can predict real-world creativity. Further, their study found that personality and fluid intelligence, had a correlated high with real-life creativity whilst, insight problem solving skills and everyday creative behaviour had no relation to the participants' achievement (Beaty et al., 2014). Leutner, Yearsley, Codreanu, Borenstein & Ahmetoglu (2017), however, argue that assessments of individual differences in creativity, using, text based psychometric tests, can struggle to engage participants, allowing fake responses and not necessarily assess real life creativity. The authors argue that an image based creativity test can reduce misunderstandings, engage the participants' and be disposed more easily and could be seen as an alternative method for assessing creativity (Leutner et al., 2017).

### **Affect**

Affect can be considered as a cluster concept Barsade and Gibson (2007) argues, the term generally refers to feelings and includes temporary feeling states and feeling traits. The feeling states can be distinguished by emotions and mood, where emotions often are short-lived response aimed towards a cause while mood is the widely positive or negative feeling not directly related to a specific cause (Frijda, 1986, referenced in Barsade and Gibson, 2007; Lazarus, 1991; Tellgren, 1985, referenced in Barsade and Gibson, 2007). Feeling traits are the personality bound aspect of the concept and refers to the usually recurring feelings individuals are prone to feel. This could mean, that an individual with high degrees of neuroticism are predetermined to negative affect regardless if a distinct cause is present or not (Watson & Clark, 1984; Watson & Clark 1992). Age and sex also seems to play an important role in tendencies to experience affect. Studies have found that younger adults rated their negative affect higher in comparison to older adults (e.g. Mroczek & Kolarz, 1998; Ready et al., 2011),

## NEGATIVE AFFECT AND CREATIVITY

and that males report higher degrees of negative affect than females (Gohier et al., 2013). Watson and Clark (1984) explains that positive affect represents the extent an individual either feels up or down where high positive can be described with words such as excited, alert, while low positive affect can be described by words as drowsy and sluggish. Negative affect on the other hand, is to which extent a person feels upset or unpleasant. High negative affect includes affective states such as angry, guilty and distressed whereas low degrees of negative affect are characterized with terms such as calm and relaxed (Watson & Clark, 1984). Individuals affect can further be effected by a vast range of factors ranging from the climate at their workplace (Parke & Myeong-GU, 2017), and different daily events behaviours of others. Where a leader who expresses a self-sacrificial behaviour may facilitate her employees positive affect, authoritarian behaviour can facilitate negative affect (Ruyi, Lirong, & Po, 2016; Milgram, 1963).

A final remark, regarding the means researchers have used to place participants in positive or negative affect. Previous studies have for instance asked participants to recall and describe worrisome experience, grouped participants depending on their personality characteristics, used short video-clips, different wording of tasks, false memory tasks and false feedback to induce participant in a desired affective state (e.g. Leung et al., 2014.; Isen & Reeve, 2005; Makkar & Grisham, 2013; Storbeck, Davidson, Dahl, Blass & Yung, 2015). Coons and Weber (2014) calls these activities manipulation which they describe as a process influence.

### **Stress**

Stress has historically been associated with physicality's but the usage and has change since the concepts transition to other disciplines (Lazarus, 1993). Where Selye (1936) described stress as a nonspecific physiological response towards stimuli, adaptation towards external stimuli such as cold, shock and injury (Selye, 1936, referenced in Ursin & Eriksen, 2004; Selye, 1950), researchers from the 30's and 40's took an interest in stress from a physiological perspective. Interest of stress where placed on physiology where aspects such as the homeostatic concept was developed. Within the frames of the homeostatic concept a disruption in the normal homeostatic state was identified as stress, and stress was primarily associated with activation (Cannon, 1932). The term has since come to be more multifaceted with realizations such as that a stressful condition does not necessarily result in the same outcome for everyone. For some, stress may greatly arouse by a specific condition while others barley react, thus, realizing that individual differences in cognitive variables and

## NEGATIVE AFFECT AND CREATIVITY

motivation should be taken into consideration (Lazarus, Deese & Osler, 1952; Lazarus & Eriksen, 1952, referenced in Lazarus, 1993). To understand what accounts for differences in the way we respond to stress we should look inwards rather than towards the attributes and characteristics of a given stimuli (Levine & Ursin, 1991; referenced in Ursin & Eriksen 2010). Lazarus (1993) argues that psychologic stress should not simply be viewed as terms of activation in one dimension, but rather as a richly nuanced involving many diverse emotional states.

The appraisal theory assumes that the differences in how we experience and respond to stress in a situation is based on appraisal and coping. Cognitive appraisal is the process that takes place when individuals stands before a situation and determines if it is relevant or not for her well-being. The process consists of both primary and secondary appraisal the primary appraisal is the assessment of a stimuli's meaningfulness where events are appraised as either irrelevant, stressful or beneficial (Lazarus & Folkman, 1984). If an event is perceived as stressful, stress appraisal can be categorized in harm/loss, treat and challenge where harm and loss are based on previous events and experiences while challenge and threat are associated with anticipated events. The secondary appraisal (coping options) is concerned with evaluating what can be done in a situation and coping, which is the process where individuals examines what can be done about a situation by looking towards available resource. After the individual have appraised the situation an affective and emotional response comes forth because of the appraisal (Lazarus & Folkman, 1984; Folkman, 1984; Lazarus, 1993; Folkman, Lazarus, Dunkel-Schetter, DeLongis & Gruen, 1986).

**Work-Related Stress.** Other researchers have proposed more integrated frameworks where factors such as work-related stress, health, subjective health and intervention are introduced to the stress spectrum. Work-related stress, or job stress is the harmful responses that occur when the worker's capabilities and resources do not match the requirements of the job which effect their ability to cope and performance (Lepine, Yiwen, Crawford & Rich, 2016). A study of job stress among nurses found a positive correlation between job stress and workload, lack of control and an information gap while confidence, support from managers and communication correlated negatively (Asgarnezhad Nouri & Soltani, 2017). In contrast to the appraisal theory, the Cognitive Activation Theory of Stress (CATS), proposes a psychophysical approach towards stress viewing stress in a systematic manner where the term refers to four different aspects of stress that are measured separately. The aspects of stress the term refers to are, *stress stimuli*, stress experience, the non-specific, general stress response and experience of the stress response (Ursin & Eriksen, 2010). The stress stimuli are



## NEGATIVE AFFECT AND CREATIVITY

appraised as either threatening or pleasant based on previous experiences and outcomes of the stimuli where the stress response is a general alarm in the homeostatic system, stress first occurs when the homeostasis is threatened or in imbalance (Ursin & Eriksen, 2010; Levine & Ursin, 1991; referenced in Ursin & Eriksen 2010). Viewing stress systematically allows for it to be measured in more than one way. The stressor can for example be measured by looking at the characteristics and the experience of it by asking how an individual perceives stress towards a certain task or situation. The stress response on the other hand, can be measured by focusing on individuals' arousal, which is expressed in both behaviors, such as coping and physiology. The fourth aspect of the experience of the stress response, can be measured by self-reported questionnaires about emotions (Ursin & Eriksen, 2004).

### **Affect and Creativity**

The relation between creativity and affect has primarily been studied in experimental context where there seems to be a prevailing consensus that positive affect is beneficial for creativity. Studies have found that positive affect facilitates problem solving and flexible thinking while negative affect are associated with lower creativity and flexible thinking, findings also suggests that positive affect seems to broaden the cognitive processes while a negative affective state narrows the cognitive processes (e.g. Isen & Reeve, 2005; Baas, De Dreu & Nijstad, 2008; De Dreu & Nijstad; Ashby, Isen & Turken, 1999; Fredrickson, 2001; Finucane, 2011). Despite a prevailing "consensus" a small body of research, have found opposing evidence, suggesting that negative affect can in fact, be beneficial to creativity (e.g. Carlsson, Wendt & Risberg, 2000; Clapham, 2001).

In a study by George and Zhou (2002), where employees in charge of developing creative designs and techniques for manufacturing were examined, they found that negative affect was positively related to creative performance. This, when the employees' recognition and reward for their creative performance and understanding of their own feelings were high. The authors argue that the reason for this may be that the employees with high degrees of negative affect may try harder and put in more effort to come up with new ideas, since a negative mood can indicate that something is wrong, encouraging that the individual to put in more effort and try harder (George & Zhou 2002). Similarly, Leung et al., (2014) found that participants with higher degrees of neuroticism came up with more creative designs in a workshop, and could generate more flexible uses for a brick. Friedman, Förster and Denzler (2007) argue that the framing of a task may also induce a positive respective a negative mood and argues that a serious framing of a task as opposed to a funny, may inspire individuals to

## NEGATIVE AFFECT AND CREATIVITY

invest effort in the task. Harmon-Jones, Gable and Price (2013), however, found that the nature of the affect may not be so relevant to wheatear or not the cognitive processes are broadened or narrowed, in their study. Instead, the motivational intensity, which is described as the strength/urge to move towards or away from stimuli (Harmon-Jones, Harmon-Jones & Price, 2013), was key, where low motivational intensity broadened the cognitive processes and high motivational intensity narrowed the cognition, regardless of the nature of the affect (Harmon-Jones, Gable & Price, 2013).

### **Stress and Affect**

Stress and affect are also seems to have a close relationship where stress can influence the affective response and vice versa. Almeida, Wethington and Kessler (2002) found that days individuals had encountered a stressor they to report higher levels of negative affect and lower levels of positive affect, than when days that they had not encountered a stressor. In contrast Dua (1993) found that participants that high levels of self-reported negative affect were related to higher levels of stress.

### **Creativity and Stress**

Stress can also influence the performance of a task in some conditions where stress can both increase and decrease the performance depending on the task and the individual (Lazarus & Eriksen, 1952; referenced in Lazarus, 1993). The findings of a study, also suggests that the performance of creativity tasks can be influenced by stress where participants that could relax systematically showed significant improvements on their performance of divergent creativity tasks in contrast to those who did get to rest unsystematically (Krampen, 1997). If the situation on the other hand, is stressful, skills to perform can fail. In a study of individual differences in working memory and problem-solving strategies under high respectively low pressure conditions. Participants were asked to solve math problems. In the study, it was found that pressure can harm or reduce performance by inducing worry about the situation, thus reducing the working memory capacities (Beilock, Kulp, Holt & Carr, 2004). Performance can also be influenced by stereotype threats where the performance on a task is associated to a negative stereotype. Women for example faces a stereotype threat when it comes to math which is the notion that men are better at math than women which can lead to that them perform worse which may be a result of confirming to a negative stereotype (Maloney, Schaffer & Beilock, 2013)

### **Self-Efficacy**

Self-efficacy, is the perception of one's ability to flourish in each situation or when undertaking a certain task can also determine the outcome of how well one fares by affecting both individuals thought processes and stress reactions (Bandura, 1977).

**Self-Efficacy of Creativity.** Seemingly self-efficacy also plays a role for creativity. Self-efficacy of creativity is the belief in one's ability and skill to produce creative outcome and affects individual creativity (Tierney & Farmer, 2004). Tan, Zou, Chen and Lou (2015) found in a study that individuals who managed to solve the insight problems, had rated themselves higher in overall creativity than those who did not manage to solve the problems. Tierney and Farmer (2004) also, found that when supervisors had reported that their subordinates expressed higher degrees of creativity in their work, the employees had rated that they felt high degrees of creativity.

**Self-Efficacy of Stress.** Self-efficacy of also seems to be of importance when individuals are exposed to potentially stressful stimuli. Folkman (1984) argues that how individuals perceive their control over a situation is crucial of the secondary appraisal since the evaluation reflects the efficacy of available coping resources to meet situational demands. However, Schönfeld, Preusser and Margraf (2017) found in their review that higher levels of self-efficacy led to an increased psychological stress response and decreases in performance which could indicating that high self-efficacy always isn't favorable for stress. While there can be a discrepancy between self-reported stress and actual stress, Grassmann, Vlemincx, von Leupoldt and Van den Bergh (2017) found that a avoidant coping behaviour were associated with lower cardiac arousal and argues that negative affect moderates the link between cardiac arousal and self-reported arousal.

In sum, as hopefully, illustrated above creativity is a broad field consisting of many different domains. With the presented review above we can assume that affect and stress shares a relationship, in the sense that they among a vast number of other factors can influence creativity. However, in what extent specific affective states influence creativity is not yet fully understood as the literature review suggests. Therefore, we can propose a hypothesis within this framework to further investigate the relationship between negative affect and creativity.

## NEGATIVE AFFECT AND CREATIVITY

### **Aim and Hypotheses**

The current study seeks to investigate how negative affect influences creativity using divergent and convergent creativity tasks. While it would be interesting to place a larger focus on self-efficacy, questions about self-efficacy of creativity and self-efficacy of stress was merely introduced as additional control variables to see if self-efficacy of creativity potentially influenced creative performance and if self-efficacy of stress influenced the participants rated affect. The following hypothesis were formulated:

*H1: Convergent creativity will be higher in the negative affect condition than in the positive affect condition*

*H2: Divergent creativity will be higher in the negative affect condition than in the positive affect condition.*

### **Method**

#### **Experimental Design**

To conduct the experiment a between-subject design where used where participants were randomly assigned into one of the two conditions. Participants either performed an insolvable mathematical assignment 1) which were explained as challenging but feasible and received false negative feedback (Negative affect condition) or 2) an easy mathematical assignment which were described as challenging but feasible and received false positive feedback (Positive affect condition). One dependent variable where used, which was Creativity Four independent variables where also assessed: self-efficacy of creativity, self-efficacy of stress, positive affect and negative affect. Self-reported emotions and stress, before and after the different conditions and prior experience of creativity tests where used as manipulation check.

#### **Participants**

The sample was collected from 54 Swedish university students, 39 (72.2%) male, 15 (27.8%) female. The participants ages ranged from 19 – 46 with the mean age of 24.61 ( $SD=3.89$ ). The participants were recruited on Lund's University campus, Mid Sweden University campus Sundsvall, Mid Sweden University Campus Östersund and on Stockholm University Campus through face to face interaction, e-mail and posters. While mass e-mails and posters where used in the recruitment of the participants face to face interaction ended up being the most successful means of recruiting the participants. I recruited all participants by approaching individuals and larger groups, and presenting myself and the experiment. Afterwards, I asked if they would like to participate. When someone showed interest, they were led to the experiment room and informed in detail about the experiment.

#### **Pilot project**

To test examine how long the experiment would take and if any instruction was unclear four students were recruited face to face. The participants completed the experiment in 18, 17, 13 and 15 minutes. The restriction of three minutes of the AUT task was not communicated to the participants in the pilot group.

### **Materials**

The experiments were held in small group rooms, with the assumption that a small group room in Lund should not differ from a small group room in Stockholm or Sundsvall. The rooms were all similar in setting and provided the possibility to close the doors to achieve a quiet environment to undertake the experiment. The materials used for the experiment were paper-based with the additional false feedback which was created in the interaction between the participants and the experiment leader.

### **Hypothesis Testing**

In accordance with the presumption that creativity can derive from both convergent and divergent thinking, a divergent (Guilford, 1967), and convergent (Frederick, 2005), creativity test was used to assess the participants' creativity.

**Divergent Creativity Test.** To assess the participants' divergent creativity The Alternative Uses Task (AUT) was used. The AUT is a test developed by Guilford (1967) and is a creativity test that measures divergent thinking by asking participants to rate as many uses as possible for a specific item. The item selected for this thesis was a paperclip. After the test has been distributed and collected the test user rates the provided answers by their originality, fluency, flexibility and elaboration (Guilford, 1967). To evaluate a test such as the AUT which do not have any solid answers can easily make the evaluator prone to bias, therefore a method inspired by the consensual assessment technique was used (Amabile, 1982). Me and an acquaintance rated the tests first individually, then compared the ratings. Each score that differed was averaged in to the closest integer. To use non-expert raters for non-complex tasks can be highly reliable (Amabile, 1982), however, Kaufman, Baer, Cole and Sexton (2008), found a high inconsistency when the non-expert raters' were compared to the experts.

**Convergent Creativity Test.** To assess the participants' convergent creativity, the Cognitive Reflection Test (CRT) (Frederick, 2005), was used. The cognitive reflection test consists of spatial, mathematical and verbal insight problems. The test can be perceived as a useful tool, when assessing judgements and decisions and mainly operates on the dual process of thinking (Baron, Scott, Fincher & Elmen Metz, 2015). The test consists of four different questions where participants are asked to provide an answer where the answer is wrong if they rely on their intuition and don't re-evaluate their answer. The scores were rated from 0–4

## NEGATIVE AFFECT AND CREATIVITY

by the me where each correct answer was worth one point (See Appendix B for full account of insight problems).

### **Manipulation Checks**

To assist me in determining if the participants affect had changed due to the manipulation affective measurements were used as manipulation checks.

**False Feedback & Task** To temporarily influence the participants affective state, false feedback and a mathematical task were used. The mathematical task for the experiment group was designed to be unsolvable by removing necessary information required to be solved. Mat was selected since many tend to feel anxiety towards it and was thought to produce minor affective responses from the participants (Ashcraft & Moore, 2009). Since both groups performed a mathematical task, positive feedback was introduced to the control group to combat potential negative affect that could arise. The stereotype threat was also informed to the female participants to create equal conditions to the participants (Maloney et al., 2013). The false feedback and math task were in other words, used as manipulation where the different measurements were used to examine if the manipulation had an effect.

**Positive Negative and Affect Schedule.** To measure the effect of the manipulation a translated Swedish version of the positive and negative affect schedule short form (PANAS) was used (Hillerås, Jorm, Herlitz & Winblad, 1998). The initial PANAS measurement consists of 20 items', where participants are asked to rate their current mood on a five-point scale where 10 items represented positive affect and 10 negative. The instrument has since, been shorted to consist of only 10 items, where a validation of the measurement shows high internal consistent and good discriminant correlations with longer measurements (Watson, Clark & Telegen, 1988). A study also found that the tool held high validity and reliability while testing the English based short form towards cross culturally (Thompson, 2007).

**Self-Assessment Manikin.** The Self-Assessment Manikin (SAM) which is a visual scale for measuring affective responses towards stimuli was used before and after the manipulation to assess the participants' reaction to manipulation. Sam was perceived as a visual fast complement to PANAS that would make participants to answer more intuitively and hopefully reduce the tendencies of self-serving bias (Leutner, Yearsly, Codreanu, Borenstein & Ahmetoglu, 2017). While high levels of reported, negative affect has been related to high levels of stress (e.g Dua, 1993; van Rijsbergen et al, 2015), the SAM

## NEGATIVE AFFECT AND CREATIVITY

measurement provided an additional opportunity to assess to the participants response to the manipulation by looking towards slightly different aspects from PANAS, such as dominance and arousal (Bradley & Lang, 1994).

**Negative Affect Condition.** The mathematical assignment was presented as challenging but feasible to facilitate negative affect, where the participants were told that they should be able to complete the assignment within two minutes (Hemmings, Grootenboer, & Kay, 2011; Prawat & Anderson 1994). Independently if the participants had written down an answer for the unsolvable math assignment, the experiment leader provided false negative feedback when the two minutes had passed (Beedie, Lane, & Wilson, 2012).

**Positive Affect Condition.** The assignment presented to the control group was presented as challenging but feasible to facilitate positive affect, where the participants were told that they would be able to complete the assignment in around two minutes. After two minutes, the experiment leader entered the room, collected the material and provided positive false feedback to the participants independent of their performance on the mathematical assignment (Beedie et al., 2012).

### Control Variables

To determine if other potential factors influenced the participants' performance on the creativity tasks, self-efficacy of stress, respectively creativity and self-reporting of previous experiences utilized.

**Self-Efficacy of Stress.** Further, variables regarding the participants' self-efficacy of stress was introduced as a secondary variable that potentially could be interesting to investigate if something showed up in the in the assimilated data. The participants where asked how they perceived their own reactions on stress and could answer from -5 very negatively to 5 very positively.

**Self-Efficacy of Creativity.** A question regarding participants perceived creativity was also introduced as a secondary variable. The participants where asked how creative they perceived themselves and had the possibility to rate their own creativity from not creative at all 1 to very creative 7.



## NEGATIVE AFFECT AND CREATIVITY

**Previous Experiences.** As a control measurement, the participants were after undertaking the experiment presented with a secondary background sheet where they were asked to score their previous experiences of creativity tests. They were given the possibility to rate their experiences from (1) no previous experiences to (7) previous experiences.

### **Procedure**

All participants were tested individually in a small group room that had the possibility to close the door. All the material used in the study was paper-based. First participants were briefly instructed that they would have the possibility to take part in an experiment which involve filling out some questionnaires about their background, how they feel and solve some creativity problems and that the procedure would roughly take about 20 minutes. Further, the participants were informed of what their participation would require, that they had the right to withdraw from the experiment at any time and that the data will be handled completely anonymous. The same information was also provided to the participants in written form where they could provide written consent. After the participants had provided consent to take partake in the study they were provided with a background questionnaire, a SAM questionnaire and a PANAS questionnaire and an envelope. When they had completed filling in the questionnaires, participants were presented with the mathematical task which they were told should take about two minutes to solve. Female participants were informed about the stereotype threat in conjunction with the presentation of the mathematical task. When two minutes had passed, the author provided positive respectively negative false feedback depending on which condition the participants were in.

Afterwards, the participants were presented with the remaining experiment material consisting of one alternative uses task, a cognitive reflection test tasks, two questionnaires about affect and another background questionnaire regarding their previous experiences of creativity tests. Before allowing the participants to start with the alternative uses task the participants were informed that they could spend three minutes on it and that the author would tell them when three minutes have passed. After three minutes had passed the researcher informed the participants and asked them to place all their material in the envelope when they were done. Finally, participants were debriefed about the tasks, the different conditions, the false feedback and thanked for participating and asked if they had any questions or comments.

### **Ethical Considerations.**

Since parts of the experiments did contain elements of manipulation, I thoroughly overlooked and considered ethical aspects when designing the thesis. While manipulation within research is not risk free Boynton, Portnoy and Johnson (2013) suggests that false feedback, and not revealing the true hypotheses poses little psychological harm to the participants and can be reduced by contentious behavior, well trained experiment leaders and debriefing. I also considered the four research ethical principles provided by Vetenskapsrådet (2002) consisting of the information, consent, confidentiality and usage requirement and incorporated them in the following way. The information requirement was overseen by providing written information regarding the studies purpose, what was expected of the participants if they selected to participate. The purpose was partially hidden, the participants were informed about it in its whole after participating of if they selected to quit. The requirement of consent was partially fulfilled by providing the participants the possibility to provide written consent if they selected to participate. The confidentiality requirement was overseen by not collecting any sensitive data, and providing codes to all participants.

While my experiment contained a small element of manipulation the potential affect that the participants where to feel would only be temporary and could easily naturalized by informing them about what had been done. According to me the potential gains that the study could bring weighed heavier than the potential risk to induce participants to temporary negative affect.

## Results

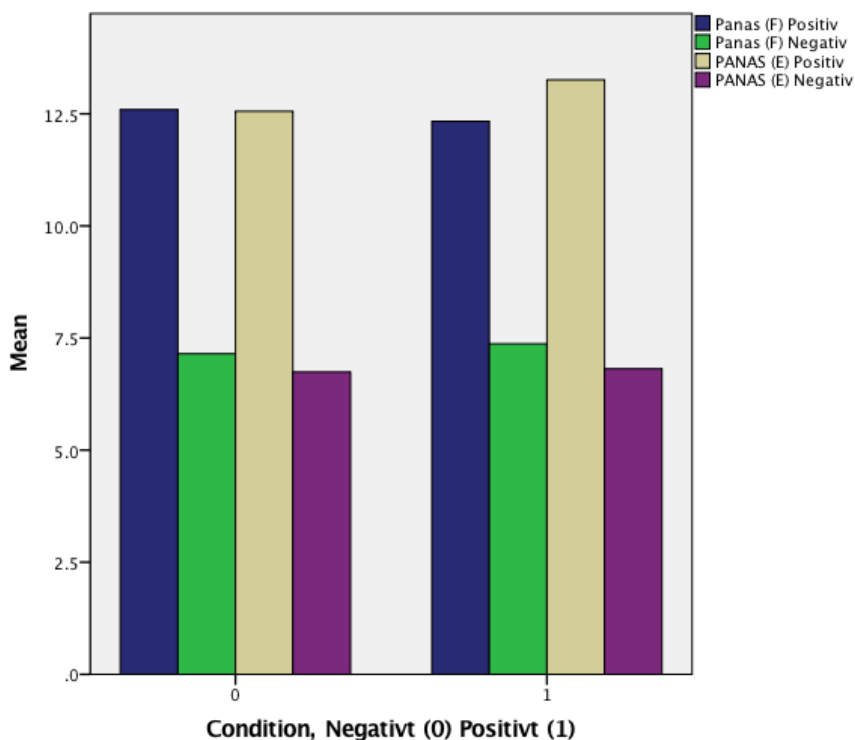
### Preliminary Analysis

Screening the data prior to the analysis two outliers were detected on the variable fluency within the divergent creativity task, one within the control group and one within the experiment group. The score of the outliers were of three, respectively four points above from the non-outlier set. An additional outlier was detected within the experiment group for the variable elaboration and originality with an exceeding score of one above non-outlier set. Analyzing the data without the outliers however, did not affect the result, therefore the outliers were kept and their scores replaced with the nearest value within the non-outlier set (Djurfeldt & Barmark, 2009).

### Manipulation Check

**Affect (PANAS).** A mixed ANOVA was conducted to examine the effect of the manipulation. There was no significant effect of the manipulation, *Wilks Lambda* = 0.97,  $F(3,50) = 0.50$ ,  $p = .68$ . The result indicates that the participants rated positive and negative affect did not differ significantly before and after the manipulation.

*Figure 1. Mean difference of group ratings of PANAS before (F), respectively after (E) the manipulation.*



## NEGATIVE AFFECT AND CREATIVITY

**Affect (SAM).** A mixed ANOVA was conducted to examine the effect of the manipulation. There was no significant effects  $Wilks\ Lambda = 0.95, F(5.48) = 0.44, p = .82$ . The results indicate that the participants' ratings of valence, arousal and dominance did not significantly change from before to after the manipulation.

### Testing of Hypothesis

**Divergent Creativity.** A one-way ANOVA was conducted to compare the different conditions effect on the participants' divergent creative task performance. There was no significant effect for the two conditions [ $F(1.52) = .29, p = .59$ ]  $\eta^2 = 0.0055$ . The results suggest that there was no significant difference in the conditions performance on the divergent creativity test and that the differences in scoring that the manipulation accounted for was small.

*Table 1. Alternative Uses Task scores for each assessment criteria.*

Groups	Originality <i>M (SD)</i>	Fluency <i>M (SD)</i>	Flexibility <i>M (SD)</i>	Elaboration <i>M (SD)</i>
Experiment	1.11 (1.48)	5.59 (2.65)	4.48 (2.20)	1.15 (.95)
Control	1.30 (1.20)	5.93 (2.59)	4.81 (2,02)	1.04(.70)

**Convergent Creativity.** A one-way ANOVA was conducted to compare the differences between the groups performance on the convergent creativity task. There was no significant variance between the conditions [ $F(1.52) = .31, p = .58$ ]  $\eta^2 = 0.0058$ . These results suggest that the different conditions had no effect on the participants' performance on the creativity tests. The variance in the performance on the test that the manipulation accounted for was small.

### Control Variables

**Previous Experience of Creativity Tests.** Independent-samples t-test analysis showed that the previous experience of creativity tests did not significantly differ between the experiment group ( $M = 2.52, SD = 1.67$ ) and the control group ( $M = 2.33, SD = 1.36; t(52) =$

## NEGATIVE AFFECT AND CREATIVITY

.45,  $p = .66$ ). A Pearson correlation coefficient was further computed to assess the relationship between the tests scores and the participants previous experience. A Pearson correlation for the AUT  $r = 0.27$ ,  $n = 54$ ,  $p = .06$ , suggests a non-significant relationship between the participants' previous experiences and their score on the task. The correlation for the CRT  $r = 0.18$ ,  $n = 54$ ,  $p = .19$ , also indicates a non-significant correlation between the participants' performance and their previous experiences. The results from both Pearson correlation tests conducted proposes that there was no relationship between the participants' previous experiences of creativity tests and their performance on the creativity tests provided in this experiment.

**Self-Efficacy of Creativity.** An independent samples t-test analysis showed no significant differences in the ratings of self-efficacy of creativity. Ratings for the experiment group ( $M = 4.22$ ,  $SD = 1.21$ ) and for the control group ( $M = 4.56$ ,  $SD = 0.75$ ;  $t(52) = -1.21$ ,  $p = .23$ , two-tailed). The results suggest there was no significant difference between how the groups rated their self-efficacy of creativity. To determine if the participants' self-efficacy of creativity affected their score on the creativity tasks a Parson's correlation coefficient was conducted. Parson's correlation for the CRT  $r = 0.20$ ,  $n = 54$ ,  $p = .14$  and for the AUT  $r = 0.19$ ,  $n = 54$ ,  $p = .15$ . The results suggest that the participants reported self-efficiency of creativity did not significantly correlate with their scorings on either of the creativity tasks.

**Self-Efficacy of Stress.** An independent-samples t-test was conducted to compare the self-reported self-efficacy of stress between the two conditions and showed no significant differences in the ratings. The rating for the experiment group ( $M = 1.30$ ,  $SD = 1.99$ ) and for the control group ( $M = 1$ ,  $SD = 2.33$ ;  $t(52) = 0.5$ ,  $p = .62$ , two-tailed). The results suggest that there was no difference significant difference between the groups in how they rated their self-efficacy of stress.

To examine if there was a correlation between the participants' ratings of affect on the SAM measurements and their self-efficacy of stress a Pearson correlation was conducted. The valence,  $r = -.10$ ,  $n = 54$ ,  $p = .46$ , the arousal,  $r = -.07$ ,  $n = 54$ ,  $p = .60$ , and the dominance before the manipulation,  $r = .16$ ,  $n = 54$ ,  $p = .25$ , and the valence,  $r = .14$ ,  $n = 54$ ,  $p = .41$ , the arousal  $r = .22$ ,  $n = 54$ ,  $p = .10$ , and the dominance after the manipulation,  $r = .11$ ,  $n = 54$ ,  $p = .44$ . The results suggest there was no significant correlation between how the participants rated their affect based on their self-efficacy either before or after the manipulation.

## NEGATIVE AFFECT AND CREATIVITY

To examine if the participants' self-efficacy of stress had an influence over their affective ratings on the PANAS a Pearson correlation was conducted. The results for the participants' positive affect ratings  $r = -.08$ ,  $n=54$ ,  $p=.57$ , and their negative affect ratings before the manipulation,  $r = -.008$ ,  $n=54$ ,  $p=.95$ , and the positive affect ratings  $r = -.16$ ,  $n=54$ ,  $p=.25$ , and negative affect ratings after the manipulation,  $r = -.09$ ,  $n=5$ ,  $p=.54$ . The results suggests that the participants' self-efficiency of stress did not significantly correlate with the participants ratings of affect.

$r = -.07$ ,  $n=5$ ,  $p=.46$

### **Discussion**

The study aimed to examine negative affect's effect on creativity throughout the use of a divergent and convergent creativity task. The hypothesis presumed that the group with the negative affect condition would perform better with regards to inconsistent previous findings regarding affective states influence on creativity (e.g De Dreu & Nijstad, 2008; George & Zhou, 2002). The results showed no statistically significant differences between the performance on the creativity tasks between the two conditions. Thus, the findings of this thesis did not support any of the proposed hypothesis *H1* and *H2*.

### **Interpretation of Results**

The results that emerged in this study implies that there were no significant differences between the negative affect condition and the positive affect condition on creativity. This means that negative affect nor positive affect did affect the participants' creativity. If this were the case, these findings would not be in the line with the body of research suggesting that negative affect has a negative effect on creativity (Isen & Reeve, 2005), or that negative affect under certain conditions have a positive effect on creativity (George & Zhou, 2007). However, examining the manipulation checks, reveals that the manipulation failed, meaning that there were no differences between the groups that were tested. The failure of inducing positive and negative affect in the conditions resulted in a testing of two experiment groups or two control groups since the manipulation did not manage to differentiate the groups. This could potentially account for the lack of variability in the participants' performance on the creativity tasks. Even though, I did not manage to find any significant results I would argue that the study contributes to the existing body of research.

### **Contributions**

Despite no significant findings in support of the hypothesis, the attempt to examine negative affect on creativity, hopefully contributes to the branch of research interested in creativity and affect. My findings, or lack thereof, most likely stems from a failed manipulation, flaws in the design and different limitations which probably is a result from my inexperience in conducting experiments. Despite my failed attempt to find results in favor of negative affect's influence on creativity, this will hopefully illuminate that continuous relevance for the proposition and encourage more experienced researcher to attempt to provide an alternative view towards the creativity and affect continuum. Perhaps negative affect is not sufficient to

## NEGATIVE AFFECT AND CREATIVITY

acquire a fair understanding of creativity. Maybe negative affect influences individuals' creativity differently depending on their personality, self-efficacy or motivation where openness or neuroticism perhaps could explain the relationship. Where negative affect for an individual with high degrees of openness would benefit from the affect while someone with high degrees of neuroticism would be hindered from the same affect. While the results by themselves do not point in any direction in support of a specific affective state, that is beneficial for creativity, the study illuminates a continuous need for research of affect and creativity and perhaps even the complex relationship between the two.

Below I will discuss some limitations that were prominent in this study and suggestions for future research directions.

### **Limitations and Future Research Directions**

The sample of students that I managed to recruit by myself with my limited resources, was quite small which generally makes it more difficult to detect smaller effects than in a larger sample. A larger sample, may have reacted differently to my manipulation if that were the case. Since I only included a small sample of students and students from different universities, the generalizability of the results to the general population is also limited. Studies in the future that wish to study negative affect and cognition, should preferably recruit a much larger sample.

Regarding the manipulation, I have a few thoughts on what may have contributed to its failure. My first thought was that the manipulation was too obvious or weak. I decided to not use a more common manipulation such as pictures or videos since my initial speculation was that students of my generation are generally dulled towards such stimuli. Also, I didn't think I had the experience to select a stimulus that ethically would induce negative affect sufficiently. While I could have used a stand-up clip to facilitate positive affect and sad scene from a movie to facilitate negative affect (Storbeck et al., 2015), I did not find that appealing and boring to be frank. I instead wanted to create a more interactive manipulation where some elements were imbedded in a task and some from my interactive false feedback. I also perceived a less concern towards that the use of a video or pictures would make the attempt to make participants feel something, obvious. While it may not be the case, Coons and Weber (2014) argues that a too obvious manipulation can render the manipulation ineffective.

My next thought regarding the weakness of the manipulation was that the selected insolvable math task, and false feedback may simply have been too weak. Chang and Beilock (2016) reports in their study that an estimate of 25% of four-year college students, and up to



## NEGATIVE AFFECT AND CREATIVITY

80% of community college students in the US experiences anxiety towards math. Anxiety towards math also, seems to be a global phenomenon and is occurring in 65 countries (Chang & Beilock, 2016). The participants of my study did however, not seem to have experienced a notable negative affect towards the presented math problem. During the experiment after the two minutes was up, some participants of the negative affect condition expressed that the problem could not be solved and wrote so in the comment section on the last page. Other participants of this condition, also wrote this on the provided answering area on the actual task, which was observed when I went through the participants answer sheets to transform the data to my data set. The false-feedback may also, potentially have failed, by me not being serious enough or that the participants didn't perceive it as relevant enough. The math assignment may also have been too easy to be perceived as threatening, which could explain the lack of the participants' reactions (Lazarus & Folkman, 1984). The same goes for the positive condition, that my positive false feedback was not enough to additionally increase their degrees of positive affect. Participants of both conditions, also expressed that the creativity tasks and their partaking of the experiment was fun and exciting which potentially suggests that something in the experiment material, my behavior or the setting unintentionally may have induced positive affect to all participants.

A concluding remark regarding my initial thoughts on the manipulation, is that my mathematical task in combination with false-feedback was probably not enough to create concern for my sample of young Swedish students who already study at a high level and presumably are fairly acquaint with numbers. Studies in the future should instead perhaps, test their false feedback and selected task on a larger sample to ensure that an affective response is generated. A more even gender distribution would be beneficial since it would more fairly represent the sample. Also, if they select to precede with using a mathematical task as part of their affective manipulation, examine how their selected population relates to math.

My second thought, regards my own role in the experiment. While it often is spoken about more thoroughly in qualitative studies, about the researcher's role, I think my role in the experiment may have affected the outcome. Kvale and Brinkmann (2009) mentions that a tension between professional distance and personal friendship exists in research where an engaged interviewer can come to be a warm researcher or even a friend. While I did not specifically conduct interviews, I approached almost every participant face to face and communicated with them in a friendly manner. Since I did not have access to resources such as gift cards, movie tickets, or other rewards that perhaps would have increase the incitement to partake in a study, I had to rely on participants own interest in creativity, and perhaps my

## NEGATIVE AFFECT AND CREATIVITY

communication skills to get participants to partake in my experiment. My friendly approach towards the participants may have resulted in them seeing me as friendly. This in its turn could potentially have led to that the participants of the negative affect condition did not perceive my false feedback as stressful or threatening (Lazarus & Folkman, 1984).

Another reason could have been that I was not successful in providing false feedback in a believable or convincing fashion manner. If someone else on the other hand were to recruit the participants and they did not get to meet me before the experiment, the participants may have perceived me otherwise. For future studies that wishes to take a similar approach, using false feedback, I would recommend using a different recruiter than the experiment leader. If the negative affect group instead were phased by an authoritarian experiment leader (Milgram, 1963), that perhaps took the mathematical assignment out from the experiment room and provided false feedback to them, inducing negative affect may have been more successful.

My third and final thoughts are regarding the design and measurements. Using a variation of the consensual assessment technique without using experts and relying on my own and my acquaintances ability to rate the tests may have weakened the results validity. Amabile (1982) argues that the difference between expert judges as opposed to non-expert judges were low when a poem was judged, while the reliability greatly differed when the creativity of complex items and products were judged. Whether the Alternative Uses Task is a complex task I'm not quite sure of but the assessment of the participants' originality, fluency, flexibility and elaboration may have been different if expert judges had been used instead. Another weakness in my study is that I did not examine the interrater rater reliability between myself and the other rater which also could had affected the validity of the ratings (Kaufman et al., 2008).

Another limitation in the use of my measurement of my study was that I used both the SAM and PANAS measurement close to each other. This could lead to a response bias and that that the participants remember what they previously answered, which would affect the validity of their answers (Tompson, 2007). Then regarding self-reported affect there might be a discrepancy between their actual affect and stress response and rated scores (Ursin & Eriksen, 2004), if I would be to measure changes in participants' pulse or skin conductance instead there may have been a difference, therefore I suggest that future researchers use both self-reporting scales and physiological measurements to provide an additional measurement of the same variables. A visual validated complement for both the self-reporting assessments

## NEGATIVE AFFECT AND CREATIVITY

and the creativity tests would also perhaps be desirable in order to further engage the participants, and potentially reduce misunderstandings (Leutner et al., 2017).

I also think my control question regarding previous experiences of creativity is flawed and could be developed further. As it stands now the answers that stems from that question may provide an insight in that the participants have previous experiences of creativity, but not specifically what kind. That could for example mean that two participants who rates their previous experiences at the highest level have very different experience, where one might have partaken in a creativity experiment whilst the other has taken an online creativity test. Despite their identical ratings, the meaning behind could be very misleading which in its turn affect the validity of the measurement. I suggest that researchers who selects to include these kinds of control questions ask more specific questions or ask their participants to elaborate on what their previous experiences consists of. And, regarding my creativity measurements. In line with Beaty et al (2014) the question remains if insight problems really measure real life creativity or just the participants' creativity in relation to the test. While I would like to think that I did measure their "real" creativity, their findings pose questions regarding this. If future studies took this into consideration and developed a real-life task that required creativity they could perhaps bridge the gap between theory and practice and be certain to a larger degree that they measured real life creativity. Additionally, I would also recommend future researchers to continue to use visual complements while testing creativity as Leutner et al (2017), argues, it could be a complement to current creativity assessments if it's validity and reliability is developed. The use of math may also have provided an unequal possibility for the participants' affective response since women generally react more negative towards math (Maloney et al., 2013).

Finally, as Hennessey and Amabile (2010) argues that creativity needs to be studied interdisciplinary and on multiple levels, I would propose that future researchers overlooked more factors besides from affect such as motivation, cultural background and personality (e.g, Harmon-Jones, Gable & Price, 2013; Leung, et al., 2014), to achieve a broader view of the creativity continuum.

### **Conclusion**

This thesis took off in the pursue of examining affect and creativity by posing questions regarding an already given relationship between the two but where however unsuccessful, leaving many questions still unanswered. Perhaps the manipulation failed which seems to be the most reasonable explanation and the non-significant results forces me to dismiss my proposed hypothesis. But what if the most obvious explanation where not the case, and I simply did not manage to capture the affective response of the participants due to insufficient measurements, perhaps the relationship between negative affect and creativity is not as direct as my hypothesis proposed but rather just one among a vast range of factors that correlates with creativity. While this thesis whether that where actually the case thesis, this thesis will hopefully further illustrate the need for more studies to investigate the partially prioritized dimension of negative affect on creativity in the ever-growing study off affect and creativity.

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**Appendix A**

Manipulation of negative affect condition (0) and positive affect condition (1)

**(0) Mathematical Task for Experiment Group**

$$\text{Banana} + \text{Banana} + \text{Banana} = 30$$

$$\text{Banana} + \text{Apple} + \text{Apple} = 20$$

$$\text{Apple} + \text{Pear} + \text{Pear} = 9$$

$$\text{Banana} + \text{Apple} \times \text{Strawberry} = ?$$

Skriv ditt svar här: \_\_\_\_\_

**(1) Mathematical Task for Control Group**

$$\text{Banana} + \text{Banana} + \text{Banana} = 30$$

$$\text{Banana} + \text{Apple} + \text{Apple} = 20$$

$$\text{Apple} + \text{Pear} + \text{Pear} = 9$$

$$\text{Banana} + \text{Apple} \times \text{Pear} = ?$$

Skriv ditt svar här: \_\_\_\_\_

## Appendix B

### Experiment material.



**LUNDS**  
UNIVERSITET

## Kreativitetsexperiment

I denna studie ges du möjligheten att utmana din kreativa förmåga genom att lösa några problem som kräver kreativitet. Syftet med studien är att undersöka hur personers kreativitet tar utlopp. Eftersom att begreppet kreativitet är mångfacetterat och svårt att mäta direkt, används problemlösningsförmåga som instrument för att operationalisera begreppet. Förmågan att vara kreativ är något som alla människor delar, trots detta har kreativitet ett personligt utlopp för varje enskild individ.

Intresset inom ramarna för denna studien är att undersöka potentiella skillnader och eftersträvar där av inte att hitta ”bra” respektive ”dåliga” sätt att lösa problem. Det finns inga rätta eller felaktiga svar, exempelvis kan ett inkorrekt svar inom matematikens ramar anses korrekt ur en psykologisk synpunkt.

Alla svar som samlas in genom enkäten kommer endast att användas i studien som presenteras i form av en masteruppsats inom psykologi. Samtliga svar som anges är anonyma och kan inte knytas till dig som person. Att delta i studien är helt frivilligt och du kan när som helst avbryta ditt deltagande utan motivering. Väljer du att återta ditt deltagande, raderas dina svar.

Enkäten tar mellan 15 och 20 minuter att besvara och den består av tre olika delar. I den första delen kommer du bland annat svara på några frågor om hur du känner dig, i den andra lösa en uppgift och i den tredje lösa några kreativitetsproblem.

Kryssa i rutan nedan om du har läst instruktionerna och samtycker till att delta i studien.

---

**Tack för att du tar dig tid att delta i denna undersökning, dina svar är värdefulla!**

## Bakgrundsinformation

**Kön:** Man: \_\_\_\_\_ Kvinna: \_\_\_\_\_ Annat: \_\_\_\_\_ Vill inte definiera: \_\_\_\_\_

**Ålder:** \_\_\_\_\_

**Sysselsättning:** \_\_\_\_\_

**Studieområde / Yrkesområde:** \_\_\_\_\_

**Hur kreativ upplever du dig själv vara? Svara på en skala från ”inte alls kreativ” till ”mycket kreativ”.**

1	2	3	4	5	6	7
Inte alls kreativ kreativ					Mycket	

**Hur anser du dig reagera på stress? Svara på en skala från ”Väldigt positivt” till ”Väldigt negativt”**

5	4	3	2	1	0	-1	-2	-3	-4	-
5	Väldigt positivt				Inte alls			Väldigt negativt		



**PANAS - 10**

Denna skala består av ett antal påstående som beskriver olika känslor. Läs varje påstående noggrant och markera sedan ett lämpligt svar på det avsedda svarsfältet. Gradera ditt nuvarande mående enligt skalan nedan 1 – 5.

<b>Väldigt lite eller inget alls</b>	<b>Lite</b>	<b>Något</b>	<b>Ganska mycket</b>	<b>Mycket</b>
1	2	3	4	5

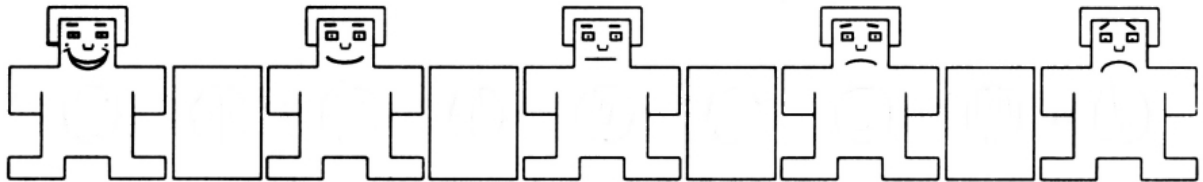
1. Upphetsad \_\_\_\_\_
2. Besvärad \_\_\_\_\_
3. Entusiastisk \_\_\_\_\_
4. Upprörd \_\_\_\_\_
5. Pigg \_\_\_\_\_
6. Inspirerad \_\_\_\_\_
7. Rädd \_\_\_\_\_
8. Nervös \_\_\_\_\_
9. Bestämd \_\_\_\_\_
10. Skrämd \_\_\_\_\_

## SAM

Du skall besvara följande frågor genom att kryssa över den bild som bäst representerar hur du känner dig just nu. Det går även bra att kryssa i rutorna mellan figureerna.

Hur känner du dig?

Hur positiv/negativ känner du dig just nu?

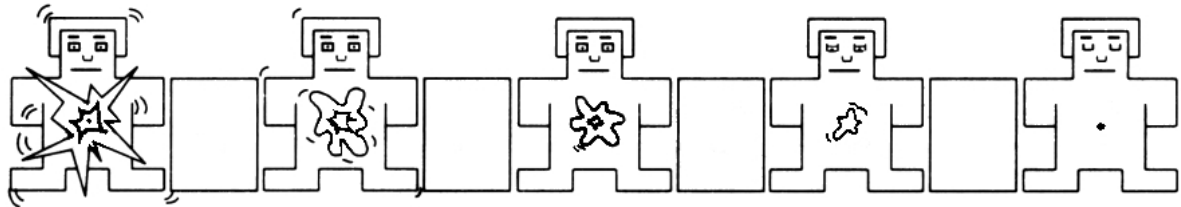


Positiv

Neutral

Negativ

Hur upphetsad/lugn är du

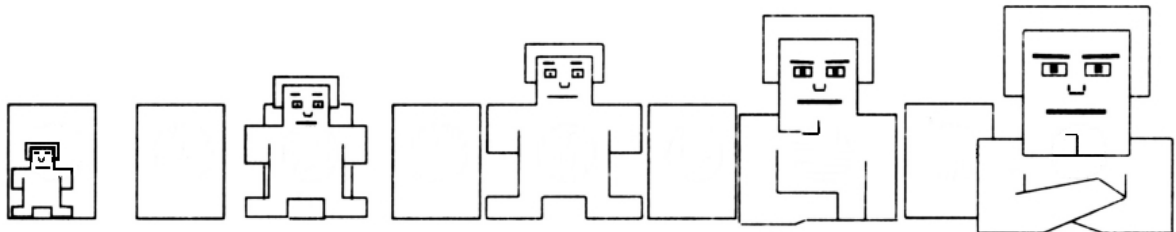


Upphetsad

Neutral

Lugn

Hur kontrollerad/hur mycket kontroll upplever du att du har?



Kontrollerad

Neutral

I kontroll



## Kreativitetsuppgift 2

### Problem 1: Maskinerna

Om det tar 5 minuter för 5 maskiner att tillverka 5 prylar, hur lång tid skulle det ta för 100 maskiner att tillverka 100 prylar?

Skriv ditt svar här \_\_\_\_ minuter.

### Problem 2: Ytan täckt av näckrosblad

I en sjö finns det en yta täckt av näckrosblad. Varje dag fördubblas ytan med näckrosblad. Om det skulle ta 48 dagar för näckrosbladen att täcka hela sjön, hur länge skulle det ta för dem att täcka halva sjön.

Skriv ditt svar här \_\_\_\_ Dagar

### Problem 3: Slagträ och bollen

Ett slagträ och en boll kostar tillsammans 110 kr. Slagträet kostar 100 kr mer än bollen. Vad kostar bollen?

Skriv ditt svar här \_\_\_\_ kr

### Problem 4: Fadern hans son

En pappa och hans son kör på en hårt trafikerad motorväg när de plötsligt frontalkrockar med en annan bil. Pappan dör direkt, men hans son körs till sjukhuset för en livsavgörande operation. Kirurgen, som kommer för att undersöka patienten, utbrister. ”Jag kan inte operera. Det där är min son!”

Hur är detta möjligt?

Skriv ditt svar här \_\_\_\_\_

## Bakgrundsinformation II

Hur ser dina tidigare erfarenheter av kreativitets tester? Svara på en skala mellan ”Inga tidigare erfarenheter” till ”Tidigare erfarenheter.

1	2	3	4	5	6	7
Inga tidigare erfarenheter					Tidigare erfarenheter	

## NEGATIVE AFFECT AND CREATIVITY

Om det finns någonting du skulle vilja tillägga, lämna gärna en kommentar:

Tack för din medverkan!

Är ni intresserad av att ta del av den fulländade studien eller har funderingar gällande dess publikation eller användning, vänligen kontakta Mastersstudent Marcus Hurtigh via mail [par15mhu@student.lu.se](mailto:par15mhu@student.lu.se) eller handledare Simon Granér Universitetslektor vid institutionen för psykologi i Lund [Simon.graner@psy.lu.se](mailto:Simon.graner@psy.lu.se) .

Återigen, tack för er medverkan, utan dig hade denna studie inte kunnat genomförts.

TACK!