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Construal of motion events and linguistic relativity

Comparing German and Spanish speakers

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Abstract

This thesis investigates a possible influence of language on thought in the domain of motion event descriptions using a cognitive-semiotic framework. Previous studies (e.g., von Stutterheim et al., 2012) have claimed that speakers of languages who construe situations as temporally ongoing through morphological aspect tend to focus more on the action itself and less on other details such as possible endpoints than speakers of languages without morphological aspect. Such differences in *linguistic construal* also seemed to enhance memory of the landmarks in question: a form of *linguistic relativity*. There are, however, a number of theoretical and empirical issues surrounding such claims.

While previous studies have focused extensively on endpoints, this study explored whether the assumptions about endpoints could also be extended to starting points. To test for linguistic relativity effects, the study consisted of two tasks: a description and a memory task. Speakers of German (no morphological aspect) and Spanish (morphological aspect) were presented with a series of short video clips of everyday motion events and asked to describe these. Subsequently, screenshots of the target items were used to check the speakers' memory of the landmarks.

The findings revealed that Spanish speakers indeed linguistically construe the events as temporally ongoing to a much higher degree than the German speakers. This, however, did not correlate with a lesser encoding of landmarks, where both language groups mentioned equally many landmarks. Further, while both speaker groups remembered endpoint-landmarks to a similar extent, starting point-landmarks were better remembered by the Spanish speakers. Finally, a positive correlation between landmark mentioning and memory was observed irrespective of language. Thus, the results show that linguistic construal may indeed enhance memory. However, they also justify the need to distinguish between different kinds/levels of construal that influence our conception a given situation, which, in return, may affect memory, amounting to a rather weak form of linguistic relativity.

Keywords: aspect, boundedness, cognitive semiotics, construal, linguistic relativity, motion events, phenomenology, Semiotic Hierarchy

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Abbreviations

DE	German
E	Expression
E0	(control condition) Endpoint reached
E1	(critical condition) Endpoint not reached (but implied)
ES	Spanish
FoR	Framework of reference
GH	General hypothesis
H	Specific hypothesis
IQR	Interquartile range
LHQ	Language history questionnaire
LM	Landmark
LTR	Left to right
MR	Landmark mentioned and remembered
NAM	Non-actual motion
NR	Landmark not mentioned but remembered
O	Object
Q-bounded	Qualitatively bounded
RTL	Right to left
S	Subject
S0	(control condition) Departure from starting point shown
S1	(critical condition) Departure from starting point not shown (but implied)
T-bounded	Temporally bounded
T1	Task 1 (description task)
T2	Task 2 (memory task)

1 Introduction

The phenomenon of language and its relation to thought has been debated for centuries by philosophers, linguists, and other researchers. Especially the age-old question of whether language influences thought has encouraged an ever-growing body of empirical research on the interrelatedness of the two. This area of scientific inquiry is generally known as *linguistic relativity* (e.g., Zlatev and Blomberg, 2015) and has given rise to many subdomains and theories.

One such subfield of investigation is the domain of *motion event construal* (e.g., Slobin, 1987). While much research in this domain has concentrated on the semantic differences observed in motion event descriptions between different languages (e.g., Talmy, 1985), recent studies have shifted their focus to whether such differences affect the way speakers construe events in experience, for example in memory. For instance, studies by von Stutterheim and Nüse (2003) and von Stutterheim, Andermann, Carroll, Flecken and Schmiedtová (2012) claimed that speakers of some languages, such as German and Czech, typically encode more *endpoints* when describing motion events than speakers of languages, such as English and Spanish, and that such encoding correlates with the ability to remember such goals. They proposed that this is due to differences in *linguistic aspect*, and in particular the marking of an event as “ongoing”. While English speakers may mark aspect morphologically on the verb itself, as in (1), German speakers would need to add lexical means to express the ongoingness of an event, as in (2).

(1) *A man is walking to a shop.*

(2) *Ein Mann geht (gerade) zu einem Geschäft.*

A man walks (*at the moment*) to a shop

‘A man is walking to a shop.’

Von Stutterheim et al. (2012) suggest that due to this difference, English and Spanish speakers tend to focus more on the process/activity itself and may therefore bypass the expression of

endpoints in their verbal descriptions, while German and Czech speakers would tend to construe the events as more bounded, and thus focus on endpoints.

However, such studies leave several open questions. If the lack of morphological aspect for the expression of ongoingness in German is responsible for such differences, why should it only manifest itself in more endpoints and not also in more starting points? Further, should there not be a distinction made between different kinds of boundedness as shown by Croft (2012): temporal (T) and qualitative (Q), which do not necessarily correlate? Finally, how should the relation between linguistic and experiential/conceptual construal be understood, considering that some researchers assume that the former can *determine* the latter (Zlatev and Blomberg, 2015)?

The present thesis aims to shed light on these questions and, in a more general sense, to contribute to research on linguistic relativity with the help of cognitive semiotics, a new discipline that investigates meaning making by combining methods and concepts from cognitive science, semiotics and linguistics (Zlatev, 2015; Konderak, 2018). Empirically, this was done by means of an experiment involving German and Spanish participants, which comprised a description and a memory task. This allowed investigating if (a) speakers of German encode more starting and endpoints than speakers of Spanish when describing motion events, and (b) if such encoding enhances memory performance.

The structure of this thesis is as follows. Chapter 2 provides the necessary theoretical background, including key concepts and an overview of previous studies, and concludes with the general hypotheses. Chapter 3 introduces the methods and procedures applied in the empirical study and spells out the specific hypotheses. Chapter 4 describes the results, which are then discussed in Chapter 5, taking into account the theoretical background. Finally, Chapter 6 presents the conclusions and implications derived from the findings of this study and makes suggestions for further research.

2 Theoretical background

The aim of this chapter is to provide the necessary theoretical background for the thesis. In a top-down manner, relevant concepts from the discipline of cognitive semiotics are introduced in Section 2.1; these build the basis for the general theoretical and methodological framework of the present study. The theory of the *Semiotic Hierarchy* (summarized in Section 2.1.3) is particularly relevant for discussing the nature of language and its relation to thought. The chapter then proceeds by discussing the key concept of *construal* (Section 2.2) and its implications for linguistic relativity (Section 2.3). Section 2.4 presents a brief overview of previous studies on motion event construal with special attention paid to methodology. The chapter concludes with a summary and the formulation of several general hypotheses (Section 2.5).

2.1 Key concepts in cognitive semiotics

Cognitive semiotics is a relatively young discipline that integrates methods and theories from linguistics, cognitive science, and semiotics to study the phenomenon of (human and non-human) meaning making (Zlatev, 2015). The ultimate goal is to provide new insights into how various kinds of meaning are created and how they manifest in communication and experience. Previous studies have focused on awareness (Mouratidou, 2020), agency (Mendoza-Collazos and Sonesson, 2021), metaphors (Stampoulidis, Bolognesi and Zlatev, 2019; Bundgaard and Sonesson, 2019), non-actual motion in language and experience (Blomberg, 2014, 2015), and the typology of motion event description (Zlatev, Blomberg, Devylder, Naidu, and van de Weijer, 2021), among other topics. Cognitive semiotics also studies similarities and differences between the cognition and communication of human beings and other animals (e.g., Zlatev et al., 2013). Its most general ambition is to “mend the gap between the humanities and the sciences” (Zlatev, 2015, p. 1059).

As this thesis aims to contribute to the research field of linguistic relativity: the possible influence of different languages on thought processes, adopting a cognitive-semiotic framework

seems particularly appropriate for several reasons. Firstly, the combination of perspectives, definitions, and explanations of difficult higher-order concepts such as meaning (making), language and construal pave the way to a more complete picture of the field, which is essentially transdisciplinary. An example of how cognitive-semiotic theory is applied in the present study is presented in Section 2.1.3 where the concept of language is explored on the basis of the *Semiotic Hierarchy* (Zlatev, 2018).

A second reason lies in the tools offered by cognitive semiotics, such as the *conceptual-empirical loop* (Zlatev, 2015), creating a cycle of interaction between conceptual issues and empirical investigation, and *pheno-methodological triangulation* (Pielli and Zlatev, 2020), which emphasizes the importance of 1st-, 2nd-, and 3rd- person perspectives in the study of meaning (making). Both are opportune for the topic of this thesis, as described in the following subsections.

2.1.1 The conceptual-empirical loop

One of the central characteristics of cognitive-semiotic research is to approach highly meaningful phenomena, such as language and cognition, by integrating conceptual and empirical questions in a *conceptual-empirical loop*. This tool allows researchers to explore the nature of a given phenomenon from both a conceptual and empirical perspective, thereby obtaining deeper insights into the phenomenon studied.

On the conceptual side of the loop, questions of the kind *What is X?* are posed to obtain an initial understanding of the concept(s) under study. Subsequently, questions such as *How does X, e.g., manifest itself, develop in Y, etc.?*¹ on the empirical side add to the answers obtained on the conceptual side and will enhance this knowledge, allowing for a possibly endless spiral that enriches our understanding of X with every loop. The idea is that “results of empirical studies do not just follow from but also help explicate the phenomena in question” (Pielli and Zlatev, 2020, p. 4). Applying the conceptual-empirical loop to the present topic, the questions posed are as follows:

¹ Note that questions on the empirical side of the loop do not always have to be formulated as “How?”-questions; it is essentially their empirical nature that distinguishes them from the kind of questions posed on the conceptual side.

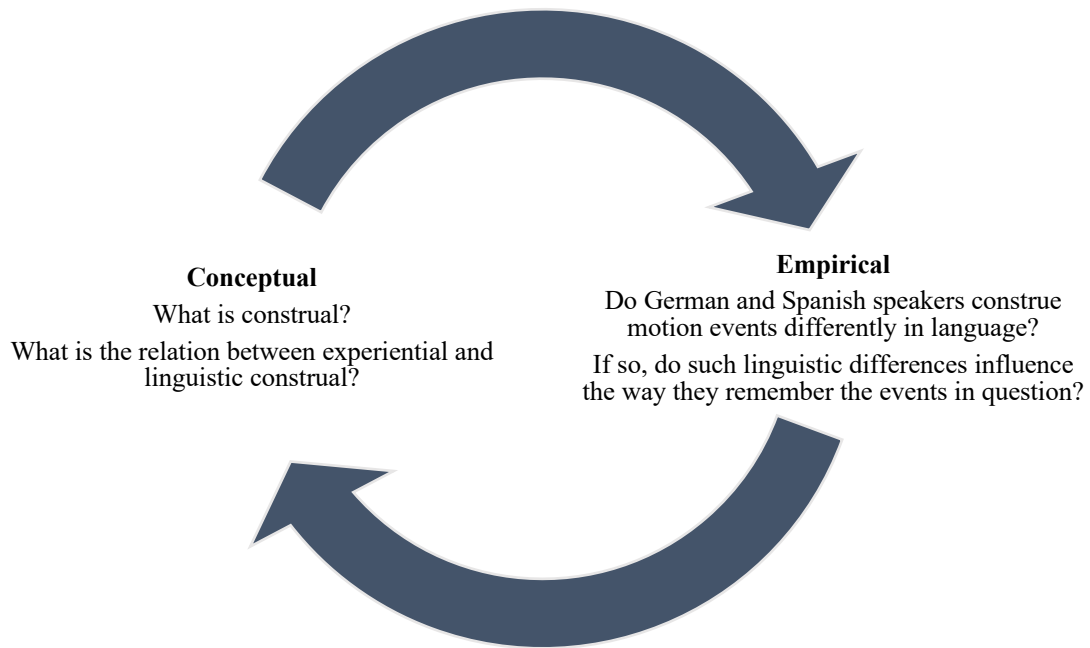


Figure 1: The conceptual-empirical loop applied to the present thesis

The questions on the conceptual side of the loop are explored in the course of this chapter and aim to provide an initial understanding of the role of language in motion event construal. This knowledge is then applied in Chapters 3 – 5 to answer the empirical questions by means of an elicitation-based experiment. In Chapter 6, the findings obtained are used to offer new insights into the concepts discussed in this thesis, and thus a return to the conceptual side.

2.1.2 Phenomenology and pheno-methodological triangulation

A second indispensable tool in cognitive-semiotic research is *pheno-methodological triangulation*, acknowledging the indebtedness of most cognitive-semiotic research to the philosophical school of *phenomenology* (e.g., Husserl, 2001; Merleau-Ponty, 1962; Sokolowski 2000). As Sokolowski (2000, p. 2) aptly states, phenomenology is “the study of human experience and of the ways things present themselves to us in and through such experience”. Its main premise is to “*depart from experience itself*” (Zlatev, 2015, p. 1060) and to describe it as accurately as possible. In other

words, phenomenology aims to describe subjectively experienced phenomena in intersubjectively valid terms through “the careful description of what appears to consciousness precisely in the manner of its appearing” (Moran, 2005, p.1).

The integration of ideas from phenomenology in this thesis becomes apparent in several aspects. Firstly, it is applied in the present section where I proceed in describing pheno-methodological triangulation. Secondly, it plays a significant role in the account of different kinds of meaning, e.g., in perception, memory and language, and their relations. For instance, the experimental study is based on *perception* of motion events (represented in video clips), their subsequent expression in language, and finally in the way they are remembered by the participants. The assumption is that by identifying and analysing differences in the event descriptions provided by the participants as well as the results obtained from the memory task, it will be possible to draw conclusions about how these phenomena (motion events) are experienced and verbally construed in German as opposed to Spanish.

Pheno-methodological triangulation combines three kinds of methods, from three complementary perspectives: first-, second- and third-person methods. First-person methods like intuition-based analysis and phenomenological reduction (Gallagher and Zahavi, 2012) are primary, as all experience is necessarily given to us as conscious subjects; thus, it is necessary “to understand the experience in terms of the meaning it has for the subject” (Zahavi, 2010, p. 4). In this thesis, the first-person perspective is met in the conceptual analysis of construal as well as in the systematic intuitions employed in the creation of the video stimuli.

The second-person perspective involves engagement of the researcher with other individuals and thus relies to a great extent on empathy (Itkonen, 2008; Zlatev, 2015). This perspective manifests itself in the present thesis through my interaction with the participants in the study, especially in the debriefing where I engaged in conversation with the participants to obtain valuable thoughts and comments from them on how they experienced the different tasks. This empathetic interaction enabled the researcher to identify relevant information and interpret it accurately.

Finally, the third-person perspective relies on the idea of maximal detachment of the researcher to the object of study. The aim is to apply methods that offer an “objective” view on

the object under study and therefore usually include empirical experiments and statistical analyses. This was achieved by operationalizing and quantifying the variables of the present experiment as well as by carrying out statistical analyses in order to correctly code and interpret the obtained data. The following Table 1 illustrates the methods for each perspective and their applications in this thesis.

Table 1: Pheno-methodological triangulation as applied in this thesis

Perspective	Methods	Application in thesis
First-person ("subjective")	Conceptual analysis Systematic intuitions	Conceptual analysis of language and construal Creation of experimental material
Second-person ("intersubjective")	Empathy	Interaction with participants during the experiments, providing assistance and guidance throughout the two tasks Debriefing of participants upon completion of the experiment
Third-person ("objective")	Detached observation Experimentation	Operationalization and quantification of variables Statistical analysis

2.1.3 The Semiotic Hierarchy

When investigating a possible influence of language on thought, it becomes necessary to determine what these two concepts imply and what kind of relationship exists between them. Neither of these two concepts has a clear-cut definition and an attempt to provide an exhaustive analysis would go beyond the scope of this thesis. However, understanding how language as a semiotic system is grounded upon pre-linguistic intentionalities that manifest themselves on different levels of meaning (making) may help understand the dialectical relation between language and thought. One example of a synthetic, cognitive-semiotic theory is the Semiotic Hierarchy (Zlatev, 2009, 2018; Zlatev and Konderak, 2022).

The theory comprises five different layers of meaning making with higher layers presupposing lower ones, but at the same time "sublimating" these lower layers, and at least

potentially affecting them. In phenomenological terms, there is a relationship of *Fundierung* (Merleau-Ponty, 1962) between each layer in the hierarchy. Each layer corresponds to a particular kind of *intentionality*: the directedness of consciousness, in the most general sense of the term, beyond itself, and thus to the world.

Further, each layer is characterised by an internal dialectics of *spontaneity* and *sedimentation*, a concept based on a spatial metaphor.² The point is that spontaneous acts of (inter)acting in the world lead to the establishment of various kinds of norms, from habits to linguistic rules, and these constrain but do not determine the acts from which they emerge (Zlatev, 2018).

For the sake of simplicity, I here follow Pielli and Zlatev’s (2020) approach and distinguish between *three levels of meaning*: (a) the layers of life and subjective experience (first and second layers); (b) the level of interpersonal experience (third layer); and (c) the level of signitive (i.e., sign-based) meaning (fourth and fifth layers) (See Figure 2).

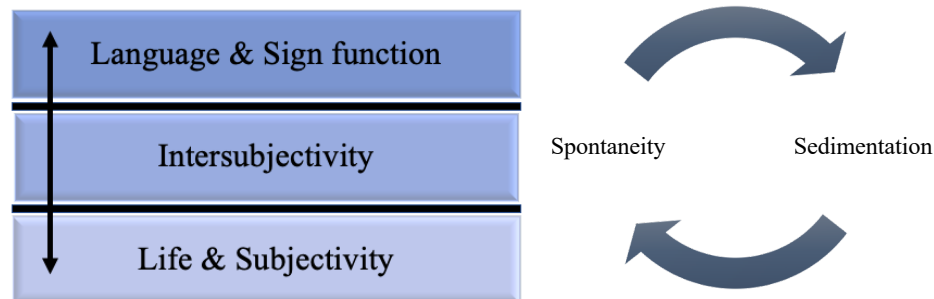


Figure 2: The (adapted) model of the Semiotic Hierarchy along with its internal dialectics of spontaneity and sedimentation

(a) Subjective meaning

² “Sedimentation, in spatial terms, describes a process whereby particles collect together and build vertically. This vertical process, in turn, leads to the establishment of horizontal strata that over time form a stable structural configuration. Thus, sedimentation not only combines structure and process, spatial order and becoming, but also two spatial movements that on the face of it are mutually exclusive: particles sediment in a downward movement, leading to the formation of stratified configurations that grow from the bottom upward.” (Waelert, 2011, p. 119)

The most basic levels of meaning are shared by all sentient creatures, including (at least) the kingdom of mammals (Godfrey-Smith, 2020), which of course includes also us human beings. Here, our interactions with the world are guided by (mostly unconscious) *body schemas* and (mostly conscious) *body images* (Gallagher, 2005), which both allow us to experience a world imbued with meaning, for example: pain, pleasure, colours, shapes, textures, smells, tastes – and movement. This is the level on which we perceive and subjectively construe, motion events as individuals.

(b) Interpersonal meaning

Intersubjectivity is “the sharing of affective, perceptual, and reflective experiences between two or more subjects” (Zlatev, 2008, p. 215). Once *shared intentionality* (for example with joint goals, like carrying a heavy object up the stairs) has appeared, it is no longer a matter of our own private construal, but of a joint, or negotiated understanding of a situation: construal as an intersubjective phenomenon (Möttönen, 2016).

(c) Signitive meaning

When we perceive, remember or even imagine things we do not use signs, but when we use pictures, words and pointing gestures, we do (Sokolowski, 2000; Sonesson, 2021). There are many definitions of the sign, but the one adopted here is that of (Zlatev, Zywiczynski and Wacewicz, 2020, p. 160):

A sign is used (produced or understood) by a subject S, if and only if:

- a) S is made aware of an intentional object O by means of expression E, which can be perceived by the senses.
- b) S is (or at least can be) aware of (a).

This means that only subjects with *reflective* consciousness can (learn to) use signs (the second clause of the definition), and that once they do so, their intentionality becomes mediated, not going directly to, for example, a motion event, but via a *representation*: in language, gesture, depiction or possibly some composite polysemiotic communicative system.

As with the other layers, this level of meaning is characterized by the dialectics of spontaneity and sedimentation. This interrelation is most apparent in the case of predominantly conventional signs, i.e., *symbols* such as those used in language, where social sedimentation plays an essential role in the construction of meaning but does not determine it. From this perspective, language may be defined as *an articulated symbolic system for the expression of thought*, given that symbols are understood as:

(a) *representational*, i.e., they are understood by their users as denoting general or specific objects, properties, and events, (b) *conventional*, i.e., shared within a community, though not necessarily “arbitrary,” (c) expressed along with *communicative intent*, and (d) *systematically* interrelated. (Zlatev, 2018, p.13)

Further, as with all sign systems, language and its expressions do not represent the world in a neutral way, but “through both conventional and contextual *construals*” (Zlatev, 2018, p. 13), which naturally leads to the topic of the following section. However, before proceeding, one of the main implications of the Semiotic Hierarchy should be highlighted: language is both dependent on pre-linguistic intentionality (e.g., perception), and adds a new layer of intentionality, since when we use signs, we do not interact with the world of experience directly, but only through their mediation. This makes it possible for language to have an effect on consciousness and thought to *some* degree; to what degree remains to be investigated.

2.2 Construal

Sentences (3) and (4) are verbal descriptions of alternative construals of a situation, i.e., different linguistic possibilities for expressing the same objective situation, but in different ways.

(3) *The glass is half full.*

(4) *The glass is half empty.*

The term *construal* was originally introduced in semantics by the cognitive linguist Ronald Langacker (2008) who describes it in the following way: “It is hard to resist the visual metaphor, where content is likened to a scene and construal to a particular way of viewing it.” (Langacker, 2008, p. 55). While this general understanding of construal largely agrees with the one adopted in this thesis, here, the concept is analysed from a cognitive-semiotic perspective in a *layered* fashion, in accordance with Zlatev (2016) and Zlatev and Möttönen (2020). As most cognitive linguists, Langacker is unfortunately not clear about the differences between the different kinds, or layers, of construal.

For example, Croft and Cruse (2004, p. 19) state that construal “depends on how the speaker conceptualizes the experience to be communicated”. However, this formulation is ambiguous, since it is not clear what kind of meaning – in the senses discussed in the previous section – is meant by “conceptualization”. As pointed out by Divjak, Milin and Medimorec (2020, p. 39), “language can be seen as a promotor or a demotor of the salience of various situational cues, which modulates how we attend to those cues”, and thus clearly plays a role in construal. In light of the discussion in Section 2.1.3, the question should be posed: What is the relation between linguistic and non-linguistic construal? In fact, at least three different kinds of construal can be distinguished, corresponding – to a degree, but not completely – to the three levels of meaning discussed: (1) Subjective (psychological), (2) Situated (pragmatic) and (3) Conventional (semantic).

The psychological level is that of the individual mind, even though it should not be understood as *purely* subjective (Zlatev and Blomberg, 2016). Due to different features of “embodied intersubjectivity”, different people who view the same motion event independently would distinguish the same moving figures (e.g., a car), landmarks (e.g., a road, a tree), trajectories (e.g., driving off the road), endpoints (e.g., the car colliding with the tree).

On the second level of construal, the individual no longer conceptualizes objects and events solely for him- or herself, but “for the understanding of the hearer” (Croft and Cruse, 2004, p. 19). Here, we are already on the level of signitive meaning (see Section 2.1.3). Construal in situated language use is “a pragmatic, communicative process, supervening on the experiences of individual speakers and hearers” (Zlatev and Möttönen, 2020, p. 5). To illustrate this, think of a situation where two students A and B take an exam and the following interaction takes place (5):

(5) *A: Oh, what an easy exam!*

B: Easy, it was terrible!

A: Well, yes, I was probably fooled by the low number of questions.

Obviously, Student A senses his friend's disappointment and changes his construal of the situation. Thus, situated construal in social contexts is shaped by the interaction between individuals.

Finally, the third level of construal is conventional, semantic construal, which presupposes the concept of sedimentation discussed in the previous section. The regular use of language for communicative purposes between individuals will eventually lead to the emergence of "relatively stable intersubjectively shared structures" (Zlatev and Möttönen, 2020, p. 5). Unlike on the situated level, semantic construal is now conventional-normative and systematic (Zlatev and Blomberg, 2016), giving rise to conventional meanings (senses) and recurrent linguistic structures.

An example of a linguistic convention that arises through historical processes of sedimentation are non-actual motion (NAM) expressions (Blomberg, 2014). As the name indicates, NAM expressions are linguistic construals of situations that lack actual motion, such as (6) and (7):

(6) *The moon **skims** across the clouds [emphasis added]* (Levinson, 1996, p. 126)

(7) *The light **streamed** in and **flooded** the whole room.*

Blomberg and Zlatev (2014) and Blomberg (2014) argue that such expressions are motivated by actual motion experiences, i.e., upon pre-linguistic intentionality, but over time have become conventional (semantic), with the experiences that originally motivated their emergence being only partially recoverable (Blomberg, 2015). This suggests that there is no one-to-one relationship between the different types of construal, and it remains an empirical question to what extent such semantic (conventional) construals influence (a) how people speak of a situation on a particular occasion, i.e., the pragmatic level, and (b) how people think of the situation, e.g., the subjective level. This leads to the topic of linguistic relativity.

2.3 Linguistic relativity

Although the idea that language may exert some kind of influence upon cognitive processes dates back a long time in history, the idea is currently often associated with the work of Benjamin Lee Whorf in the middle of the 20th century. Whorf's formulation of *linguistic relativity* (1956) has been interpreted in many different ways, the most common of which are that: (1) language determines cognition, (2) language has a strong influence on cognition, and (3) language has a weak influence on cognition. Here, these three positions will be critically assessed taking into account the ideas discussed in previous sections. The aim is not to present an exhaustive discussion, but to show where cognitive semiotics places itself in the debate on linguistic relativity and how the current study aims to contribute to this area of research.

It should first be noted that all three interpretations of linguistic relativity share a common ground: “all claim that certain properties of a given *language* have consequences for patterns of *thought* about *reality*” (Lucy, 1997, p. 294). In this sense, the determinist view builds upon the assumption that the structure and properties of each language significantly shape or even determine how its speakers perceive, analyse and behave in the world. Put simply, “each language imposes its own ‘reality’” (Blomberg and Zlatev, 2021, p. 44).

Given that language is deeply rooted in pre-linguistic, bodily experiences and cognitive processes, this strong thesis cannot possibly be true. Without prior reflective consciousness, all signs, including those of language, could not be learned.³ Further, language is not a fixed developmental end product, but subject to creative change within the dynamics of spontaneity and sedimentation. A necessary precondition for such change to take place is the ability to use language in creative ways, i.e., outside of linguistic conventions. These considerations cannot be combined with the deterministic view with a one-to-one relationship between language and thought.

However, this does not imply aligning oneself with those who position themselves at the opposite extreme, denying any kind of influence of language on thought (e.g., Pinker, 1994). Applying the understanding of language and its relation to thought that follow from the Semiotic

³ This emphasis of *reflective* consciousness is in line with the definition of the sign in Zlatev et al. (2020, p. 160) given in Section 2.1.3, where condition (b) implies not only consciousness, but a reflective awareness of (a), a type of insight.

Hierarchy and the three-level notion of construal (Section 2.2), arguments can be put forth against such a stance. The rootedness in and foundation of language upon non-linguistic cognitive processes requires an interrelatedness of these two layers of intentionality. As has been pointed out, higher layers not only “grow out” of, but also become more structured and “articulated” than lower layers.⁴ Thus, the question should not be *if* language influences thought, but rather *how* and *to what extent* (Zlatev and Blomberg, 2015), leading to the other two common readings of linguistic relativity.

The view of a relatively strong influence of different languages on corresponding thinking patterns is expressed in the work of Levinson (2003), in relation to the concept of a *spatial framework of reference* (FoR). According to Levinson (2003), speakers of different languages solve non-verbal tasks differently based on the dominant FoR of their language (*absolute, intrinsic, and relative*). The underlying assumption is that different languages differ in this respect and that these linguistic differences will affect how people think about space in general. In the last decades, a growing body of research has presented empirical evidence for an influence of language on other cognitive domains such as colour (He et al., 2019), time (Cassanto et al., 2004) and motion events (von Stutterheim et al., 2012; Park, Jarvis and Kim, 2021). However, Athanasopoulos and Bylund (2013, p. 95) warn that such researchers sometimes fall into the trap of circular reasoning, where “linguistic diversity [is] not only the premise, but also the final evidence of crosslinguistic differences in cognition.” In other words, evidence for *differences in non-linguistic intentionality* that correlates with the corresponding linguistic differences are necessary to support claims of influence of language on thought.

Slobin’s (1996) well-known thesis of “thinking for speaking” – that *when we use language, but not necessarily on other occasions*, we are influenced by its conventional structures – represents the third position in linguistic relativity: a weak influence, only in particular contexts (see Zlatev and Blomberg, 2015). This approach amounts to claiming that semantic construal (e.g.,

⁴ The notions of levels/layers, while to a certain extent metaphorical, are crucial for the theory of the Semiotic Hierarchy (see Section 2.1.3) as well as for other cognitive-semiotic models such as the Motivation & Sedimentation Model (Devyllder and Zlatev, 2022). The idea of different kinds of meaning that are both distinct and interrelated is most appropriately expressed through these notions.

having many verbs expressing manner of motion) has an effect on pragmatic construal (e.g., how a motion event tends to be described), which is almost tautological.

To address the possibility of a stronger form of influence than this, the present thesis complements linguistic with non-linguistic evidence by means of a memory test (see Chapter 3). But before turning to this, the following section provides an overview of relevant research on linguistic relativity in motion event conceptualization with a special focus on the methodologies applied.

2.4 Linguistic aspect and motion event construal

Early research on motion event description largely focused on cross-linguistic differences in the patterns used to describe different motion events (Talmy, 1985; 2000). It is on the basis of this research that Slobin argued that the grammatical structures of a language influence “what is most easily and automatically said” (Slobin, 1987, p. 435), leading to the formulation of his “thinking for speaking” hypothesis.

More recent studies have shifted their focus away from possible implications of Talmian event typology towards the area of *grammatical aspect*. In a study on conceptualization processes in language production, von Stutterheim and Nüse (2003) investigated differences in the organization of information of texts produced by English and German speakers. Their aim was to see whether speakers of these languages encoded the same number and type of events during the online description of a film. Prompted with the questions *What is happening?* and *Was passiert?* respectively, the participants were asked to retell the story depicted in the film. The findings were that the English speakers mentioned more events than the Germans,⁵ but also significantly fewer goals/endpoints of the motions of the protagonists. This was investigated in more detail in a second experiment by means of a description task involving computer-animated single-event stimuli, i.e., each stimulus depicted a single motion event. While some stimuli showed a reached endpoint, the

⁵ Von Stutterheim and Nüse (2003) specify that English speakers mentioned more „small events“, such as “he is scratching his head” or “he is looking down”, which were completely bypassed by the German participants.

critical stimuli only *implied* reaching such an endpoint. In these latter cases, the German speakers mentioned significantly more (90%) endpoints than English speakers (50%).⁶

In von Stutterheim et al.'s (2012) study, speakers of seven languages (Standard Arabic, English, Russian, Spanish, Czech, Dutch and German) participated in an experiment comprised of two tasks: a description and a memory task. The former consisted of 60 video clips with a duration of 6 seconds each: 10 critical items, 10 control items and 40 fillers. The critical items showed a figure (animal, vehicle or person) moving along a road or track. In the distance, a potential endpoint was visible, but the video clip stopped before the figure in motion reached it (e.g., a car goes along a country road, seemingly heading towards a village at the end of the road). The control items, on the other hand, depicted similar motion events, but with the endpoint reached. Finally, the fillers consisted of static and dynamic scenes (e.g., a candle burning). Again, prompted with the question "What is happening?" (in each language), the participants were shown the video clips and asked to describe the events. During this task, attention allocation was recorded by means of eye tracking.

Subsequently, a memory task was performed where 15 screenshots (10 critical items and 5 fillers) were taken from the video stimuli and the endpoint cut off. The participants were asked to write down the missing object(s). The findings were that speakers of Czech, Dutch and German included more endpoints in their descriptions than speakers of English, Russian, Spanish and Arabic who typically included information about the *trajectory* along which the figure was moving or the *location* of the event. While the number of endpoints mentioned did not differ significantly across the different languages in the control condition (endpoint reached), Czech, Dutch and German speakers included a significantly higher number of endpoints compared to the other languages in the critical condition (endpoint implied). Further, the Czech, German and Dutch participants had a higher number of fixations on the endpoint region, and also performed better on the memory task than the English, Russian, Spanish and Arabic speakers. The question was how to explain these differences.

⁶ It should be noted, however, that the methodology applied in von Stutterheim and Nüse's (2003) study is only briefly described and does not allow for replication.

The interpretation given by von Stutterheim et al. (2012) was that the linguistic structure responsible for the observed differences is morphologically encoded *linguistic aspect*, namely how an event is linguistically construed as unfolding over time: as bounded/unbounded (in the temporal sense, or “T-bounded” in terms of Croft, 2012), a notion that will become relevant for the discussion. To make this argument, von Stutterheim and Nüse (2003) distinguished between (a) languages where aspect expressing ongoingness of an event is marked *morphologically* (e.g., English and Spanish progressive forms) and (b) languages, such as German and Swedish, where such aspect cannot be marked on the verb, but can be expressed in other ways, e.g., with adverbs, and is often optional. Since Standard Arabic, English, Russian and Spanish belong to the former type, while Czech, Dutch and German belong to the latter, the authors hypothesised that “the notional category of ongoingness is less salient in planning an utterance in German compared to English” (von Stutterheim and Nüse, 2003, p. 870). Conversely, languages of the German type would more often represent “some kind of closure to an activity” (von Stutterheim and Nüse, 2003, p. 861). On this basis, the authors proposed that speakers of languages such as German would pay more attention to endpoints (goals, products of activities) and verbalise these to a higher degree than speakers of languages such as English and Spanish.

Interestingly, none of these studies compared possible differences in starting points, even though one could, in principle, apply the same logic: speakers of languages without “ongoing aspect” would be more likely to mention these than speakers of languages like Spanish, in comparable situations.

Before discussing these findings and interpretation from the current cognitive-semiotic perspective, it should be assessed whether they are consistent with the results obtained in similar studies. It should, however, be noted that the comparability between different studies depends to a large degree on the design and procedure of the experiments as well as on the languages under study, and both of these aspects have differed across studies.

Flecken (2011) compared motion event descriptions by monolingual Dutch and German speakers with bilingual Dutch speakers and found that German speakers seemed to focus less on the motion itself, and more on other aspects, such as endpoints. In a similar study, Bylund and Jarvis (2011) compared Spanish(L1)-Swedish(L2) bilinguals with Spanish and Swedish

monolinguals in a description task consisting of video clips which depicted motion events with different degrees of endpoint orientation. The results showed that while Spanish monolinguals mentioned the lowest and Swedish the highest number of endpoints, Spanish-Swedish bilinguals included more endpoints in their descriptions than the Spanish monolinguals. Notably, no non-linguistic evidence was used in any of these studies.

Flecken, von Stutterheim and Carroll (2014) addressed this problem in a follow-up of von Stutterheim et. al's (2012) study and investigated whether cross-linguistic differences between German and Modern Standard Arabic speakers observed in a description task would correlate with the results obtained in a non-verbal recognition task. While the description task followed the original study design, the distractor task was designed in the following way: it consisted of (the same) dynamic video stimuli and was shown together with additional audio cues.⁷ The findings were not only clear cross-linguistic differences in event descriptions and gaze allocation (during on-line language production), but also differences in gaze allocation during a non-verbal task, thus, confirming the hypotheses of previous studies and supporting a stronger form of linguistic relativity.

However, not all studies in this area of research have obtained similar results. Papafragou, Hulbert and Trueswell (2008), for instance, found that Greek and English speakers allocated attention differently in a verbal description task involving animated video clips of motion events, focusing on the event components typically encoded in their language. However, no cross-linguistic differences were found in a subsequent memory test.⁸ A study by Bepperling and Härtl (2013) also provided puzzling findings. Following the design of von Stutterheim et al. (2012), the results obtained from German and English speakers did not yield evidence for a language-specific difference in endpoint encoding for the description task. Furthermore, the English speakers mentioned more endpoints in the memory task than in the verbalization task, indicating a complex relation between the two tasks. In sum, there is both evidence supporting the original

⁷ For more information on the study design, see Flecken, von Stutterheim and Carroll (2014).

⁸ However, it should be noted that the motion events were not specifically designed to investigate attention paid to endpoints, but, following Talmian studies, investigated possible differences between Manner and Path encoding for bounded and unbounded motion events.

interpretations of von Stutterheim and colleagues on the effect of the presence/absence of morphological ongoing aspect on event construal, and evidence questioning these interpretations.

2.5 Summary and general hypotheses

Cognitive semiotics clearly distinguishes not only between different semiotic systems such as language and gesture, but also between different kinds of *intentionality* (meaning making): perception, remembering, languageing. The former motivate the latter (language use), but do not determine it. Linguistic descriptions may influence what we attend to (and hence perceive) and how we remember events but cannot determine these processes. These assumptions follow from the Semiotic Hierarchy (Section 2.1.3) and the relations between the three levels of construal: subjective/psychological, intersubjective/pragmatic and conventional/semantic (Section 2.2). Thus, linguistic determinism is ruled out, but the degree of linguistic influence on consciousness is left open (Section 2.3).

The studies comparing “event conceptualisation” by speakers of languages that mark *ongoing processes* morphologically with speakers of other languages that lack this option, as done by von Stutterheim et al. (2012) are intriguing but leave many open questions: Does conventional linguistic construal *determine* or merely *influence* other kinds of construal (to varying degrees)? Are speakers influenced by their respective languages in perception (even when not speaking) or only in encoding (thus a form of “thinking for speaking”)? Does this difference apply only to goals/endpoints or also to starting points? What kind of methodological differences could have led to different results in the literature?

To help address these questions and obtain a better understanding of the relations between the different levels of construal in general, the study described in the following chapters compared German and Spanish monolingual⁹ speakers with respect to (a) motion event descriptions and (b) their memory performance in relation to starting and endpoints of motion event video clips where these were only implied.

⁹ See Section 3.1 for operationalization of “monolingual”, i.e., the language criteria for participants.

On the basis of this theoretical background, the following general hypotheses were formulated.

- *GH1. When describing motion events, Spanish speakers will construe the events as ongoing processes more often than German speakers.*

This can be predicted on the basis of previous research, and due to the fact that Spanish, but not German has grammaticalized imperfective aspect. This, however, does not mean that Germans will not mark ongoing processes at all. Lexical means, such as temporal adverbials, and non-standard morphological means are available and may be used. Still, there will be an overall statistical difference in marking ongoing processes in favour of Spanish speakers.

- *GH2. German speakers will more often encode (a) starting points and (b) endpoints in situations where these are implied rather than shown than Spanish speakers. There will be no such difference in the cases where these are shown.*

This prediction is also based on previous studies with respect to endpoints and extended to starting points.

- *GH3. German speakers will more often remember the (a) starting points and (b) endpoints in the implied condition than Spanish speakers.*

This follows from the logic of linguistic relativity, beyond the weakest versions in terms of “thinking for speaking”.

- *GH4. There will be a correlation between verbal mentioning of starting and endpoints, and memory, irrespective of language.*

Even if there are no significant cross-linguistic differences, and thus no evidence for linguistic relativity, one may expect that mentioning a landmark that is at the beginning or the end of a motion event in one context, would contribute to remembering it in a subsequent context.

The methods described in the following chapter specify and operationalize these hypotheses.

Chapter 3 Methods

The concepts and theories discussed in the previous chapter provide a suitable framework for the empirical study described in this chapter. The present study was inspired by previous research on motion event descriptions, and the method largely resembles previous experimental designs in this area, especially von Stutterheim et al.'s (2012) study. However, several modifications have been made, given the differences in the theoretical framework, the research questions, and the hypotheses. The most novel aspect of the current study is its focus on both endpoints and starting points, given that the latter have not been considered in previous studies.

This chapter presents the overall study design, including information about the participants, the experimental material used as well as a detailed description of how the experiment was conducted. The chapter concludes with a brief summary and the specific hypotheses, operationalizations of the general ones presented at the end of the previous chapter.

3.1 Participants

A total of 41 participants were recruited for this study: 20 native German speakers and 21 native Spanish speakers of which one Spanish participant was excluded (see below). The recruitment was carried out primarily by means of ads composed in Spanish and German. These were published on various social media platforms, including *Facebook* and *Instagram*, and contained general information about the context, procedure and duration of the study as well as the specific criteria for participation (see Appendix A). As specified in the recruitment texts, none of the participants was studying linguistics or psychology at the time of the study or had done so in the past.

A second important criterion for participation concerned the participants' linguistic background. Since the goal of this study was to investigate a possible influence of morphological aspect on event construal, it was crucial that the participants were (a) native speakers of the respective languages and (b) did not show a significant level of proficiency in a language that

resembled that of the other group in this respect. Therefore, it was required that German participants were not fluent in a Romance or Slavic language; for the Spanish participants the same applied for Germanic languages. Fluency was operationalized based on the following set of criteria, established by the researcher and based on the response scales of the language history questionnaire (LHQ; Li, Zhang, Yu, and Zhao, 2020); see Section 3.2.

- a) Acquiring the language before the age of 10 years,
- b) high level (min. “Very good” on LHQ) of proficiency in speaking and listening, as these are considered the main pillars for understanding, and at least an “Average” (LHQ) level of reading and writing¹⁰, and
- c) living in a country where the respective language is the main language of communication (Germany or Spain).¹¹

Information on the participants’ linguistic background was acquired through a self-evaluating language history questionnaire (LHQ; see Section 3.3.3 and Appendix B) upon completion of the experiment.

Although gender was not a relevant variable, it was nevertheless considered when recruiting the participants. An equal number of male and female participants were recruited for each language group to rule out possible gender-related differences in the results. The age of the German participants ranged from 22 to 67 years with a mean age of 30 years. In the Spanish participant group, the age ranged from 18 to 68 years with a mean age of 35 years. All participants had normal or corrected-to-normal vision.

While most participants were recruited through ads posted on social media, others were acquaintances of the researcher, and yet others were recruited as a result of so-called snowball sampling or the friend-of-a-friend approach (Podesva and Sharma, 2013). The German participants

¹⁰ This distinction between speaking and listening on the one side and reading and writing on the other takes reading and writing disabilities, such as dyslexia, into account. Since a high proficiency in reading and writing was not required for the experiment and is generally not considered to affect the speaker’s knowledge about the language in any other aspect than orthography and reading time, a minimum level of “Average” (LHQ) was considered sufficient. Proficiency levels below average, however, would not have sufficed since important information was given in written form.

¹¹ Place of residence was checked before accepting participants to the experiment.

were from Germany, and the Spanish participants from Spain. Since many of the video clips were filmed in La Laguna, Tenerife (Canary Islands), and familiarity with the places shown could have affected not only the memory performance (Task 2) but also the event descriptions (Task 1), care was taken to recruit only participants who either lived in other parts of Spain or who had not been to La Laguna before. Participants from the Canary Islands were asked about this prior to the experiment. One Spanish participant living in Madrid turned out to be relatively familiar with La Laguna from frequent holiday trips. Since it could not be determined whether or not this affected their responses, the participant was excluded from the analysis.

Analysis of the data obtained in the LHQ showed that all German participants were native speakers who had acquired German in their early childhood. None of them was fluent (as defined above) in a Romance language. Nearly all Spanish speakers claimed to have basic knowledge of English and a small number of participants indicated some German skills. However, age of acquisition and self-evaluated proficiency ruled out any cases of bilingualism. All 40 participants can therefore be considered valid monolinguals of the respective languages for the purpose of the study.

3.2 The language history questionnaire

As mentioned above, additional information about the participants' linguistic background was obtained by means of a language history questionnaire (LHQ 3.0; Li et al., 2020) which the participants were asked to fill out upon completion of the experiment.¹²

The LHQ is an efficient tool for assessing an individual's linguistic background. This self-reporting questionnaire provides a means to adequately determine a participant's linguistic knowledge and operationalize terms such as language fluency/proficiency, etc. (Sabourin, Leclerc, Lapierre, Burkholder, and Brien, 2016). Although it is usually employed in studies on bilinguals or second language learners, it can be used to assess any participant's linguistic background and ensure that they meet the study requirements.

¹² For more information of this see: <https://lhq3.herokuapp.com/>

The questionnaire used in this study was the LHQ 3.0 developed by Li et al. (2020) and consisted of nine questions (see Appendix B). While the first six questions were pre-determined by the LHQ and included basic demographic information, the following three questions directly targeted the participant's knowledge and use of language(s). For the exact answer options, please see Appendix B.

1. Indicate your native language(s) and any other languages you have studied or learned, the age at which you started using each language in terms of listening, speaking, reading, and writing, and the total number of years you have spent using each language.
2. Rate your current ability in terms of listening, speaking, reading, and writing in each of the languages you have studied or learned (including the native language).
3. How often do you use each of the languages you have studied or learned for the following activities? (including the native language)

3.3 Materials

3.3.1 Experimental material for the description task (T1)

For the first part of the study 42 video clips with a duration of approximately 7 seconds each were presented to the participants on screen. Each showed a *motion situation*, in the broad sense of motion involving change of a figure's position against a background (Zlatev, Blomberg and David, 2010). Since the experiment was carried out on the video platform *Zoom*¹³ due to the Covid-19 pandemic, the exact size and quality, i.e., the resolution, of the participants' screens could not be controlled for. However, the participants were asked to use either a computer or a tablet with at least a 7-inch screen; mobile phones were not permitted. For similar reasons, it could not be determined how close to the screen a participant was sitting during the experiment.

¹³ <https://zoom.us>

The following four conditions were established containing eight items each:

1. Control condition S0: Departure from starting point shown
2. Critical condition S1: Departure from starting point not shown (but implied)
3. Control condition E0: Endpoint reached
4. Critical condition E1: Endpoint not reached (but implied)

All 32 target items showed everyday situations of a figure moving to and from places that the participants should be familiar with. The first condition S0 (starting point shown) included eight video clips of motion events where the departure of the figure in motion is shown (e.g., a car comes out of a garage), see Figure 3. Condition S1 (starting point implied), on the other hand, constituted the counterpart to S0. The video clips in this condition included a possible starting point, but it was not shown that the figure actually departs from there (e.g., a man walks down the street with a coffee in his hand; behind him one can see a *Starbucks* coffee shop, but it is not shown how the man actually comes out of the shop). See Figure 4.



Figure 3: Screenshot of stimulus S0.4 Car Drives Out of Garage (0:04s)



Figure 4: Screenshot of stimulus S1.6 Man Walks Away From Starbucks (With Cup of Coffee) (0:03s)

In Conditions E0 and E1 the focus was set on the endpoint. In Condition E0 (endpoint reached) the video clips showed a figure reaching a specific endpoint or goal landmark before the scene ended (e.g., two women walking through a large gate), see Figure 5. Condition E1 (endpoint implied), on the other hand, was the counterpart to E0 and included video clips of motion events that finished before the figure in motion reached an endpoint or goal landmark, but a possible endpoint is shown in the videoclip and could be inferred as such by the participants (e.g., a woman is walking through a park towards a climbing rock, but the scene stops before the woman reaches it.) as shown in Figure 6. Table 2 presents a full description of all target items used.



Figure 5: Screenshot of stimulus E0.5 Two Women Walk Through Large Gate (0:05s)



Figure 6: Screenshot of stimulus E1.1 Woman Walks Towards Climbing Rock (0:07s)

Table 2: Description of 32 target stimuli of the four conditions; items featuring vehicles are highlighted in grey

Condition	Left → Right	Right → Left
S0. Departure from source shown	<p>S0.1 Woman Walks Out of Building</p> <p>S0.2 Man Comes Out of Water</p> <p>S0.3 Woman Walks Away From Bench</p> <p>S0.4 Car Drives Out of Garage</p>	<p>S0.5 Woman Climbs off and Walks From Boat</p> <p>S0.6 People Walk Off Tram</p> <p>S0.7 Man Walks Out of Tent</p> <p>S0.8 Woman Cycles Out of Tunnel</p>
S1. Departure from source not shown (but implied)	<p>S1.1 Man Walks Away From Motorbike (With Helmet)</p> <p>S1.2 Hiker Walks Away From Woods</p> <p>S1.3 Man Walks Away From Pharmacy (With Little White Bag)</p> <p>S1.4 Person Walks Away From Library (With Books in Hand)</p>	<p>S1.5 Man Walks Away From Supermarket (With Shopping Bags)</p> <p>S1.6 Man Walks Away From Starbucks (With Cup of Coffee)</p> <p>S1.7 Person Walks Away From Station (With Suitcase)</p> <p>S1.8 Car Drives Away From Petrol Station</p>
E0. Target reached	<p>E0.1 Woman Walks to Cash Machine</p> <p>E0.2 Woman Walks Into Bar</p> <p>E0.3 Man Walks Into Station / Large Gate</p> <p>E0.4 Woman Walks Into Lift</p>	<p>E0.5 Two Women Walk Through Large Gate</p> <p>E0.6 Woman Walks To Bench</p> <p>E0.7 Man Walks to and Opens Door</p> <p>E0.8 Tram Goes Through Tunnel</p>
E1. Target not reached (but implied)	<p>E1.1 Woman Walks Towards Climbing Rock</p> <p>E1.2 Man Walks Towards Bus Stop</p> <p>E1.3 Woman Walks Towards River</p> <p>E1.4 Person Walks Towards Letter Box (with letter in Hand)</p>	<p>E1.5 Car Drives Towards Lake</p> <p>E1.6 Man Walks Towards Church</p> <p>E1.7 Woman Walks Towards Rubbish Container (with plastic bag in hand)</p> <p>E1.8 Girl Runs Towards Slide</p>

As can be observed in Table 2, each condition contained an equal number of items where the figure moves from left to right or vice versa. Previous studies have found that different cultures may display a *directionality bias* that can influence an individual's performance in various areas, such as perceptual exploration, drawings, aesthetic preferences, mental images of scenes, and spatial and temporal representations. For instance, Smith and Elias (2013, p. 355) observed that “left-to-right [LTR] readers made more fixations on the left side of images”, while right-to-left (RTL) readers displayed the opposite tendency. Applied to the present study, Spanish and German speakers could display a left-to-right bias, possibly influencing their perception of those video clips where the figure moves from left to right. Therefore, the number of LTR and RTL items was balanced, resulting in 16 items of each directionality.

The moving figure in almost all the target stimuli was animate. Only 4 items featured a vehicle as the moving figure, and these were distributed equally, i.e., balanced, across the four conditions with one in each condition (see Table 2). All stimuli were filmed from a horizontal perspective (landscape mode) leaving enough space for the figure to move from one side of the scene to the other. This image format also allowed for the clipping of the landmarks in the critical items, which was crucial for the subsequent memory test where the participants were presented with screenshots of the 16 critical items (see Section 3.3.2).

Crucially, the four conditions were divided into *control conditions* (S0 and E0) and *critical conditions* (S1 and E1). An important variable that was considered in the critical items was the *perceived size* of the landmark. It can be assumed that a “big” landmark will appear more salient in the video clips than a “small” one (not in reality but how they appear in the image), and thus may influence the participants' attentional bias (Ruz and Lupiáñez, 2002) and the tendency to be verbalized and later remembered. Hence, all landmarks in the critical conditions were chosen in a way to appear roughly of the same size.

Additionally, there were 10 filler items of situations with *non-translocative motion*, i.e., where the figure does not change its relative position within a given frame of reference (Zlatev, Blomberg, & David, 2010). Five of these showed motion situations with animate figures (e.g., a man doing jumping jacks; see Figure 7) and five with inanimate figures (e.g., wind turbine spinning; see Figure 8).

Table 3: Description of 10 filler items divided into animate and inanimate

Animate (human) figures	Inanimate figures
F.1 Man Doing Jumping Jacks	F.6 Coffee Pouring Into Glass
F.2 Woman Eating	F.7 Candle Burning
F.3 Woman Drinking Water	F.8 Flag Waving
F.4 Woman Scratching Herself	F.9 Wind Turbines Rotating
F.5 Man Doing Push-Ups	F.10 Water Flowing



Figure 7: Screenshot of stimulus F.1 Man Doing Jumping Jacks



Figure 8: Screenshot of stimulus F.9 Wind Turbines Rotating

Finally, three training items served to let the participants familiarize themselves with the task before the recording started. This also ensured that the participants focused solely on the action and did not get lost in detail, such as colours, surroundings, etc.

3.3.2 Experimental material for the memory task (T2)

The material for the memory task consisted of screenshots that were taken from the items in the critical conditions (S1 and E1). The source-/goal-landmark in each image was clipped off and replaced by a black space and a white question mark. Figures 9 and 10 are examples of such screenshots; the clipped off landmarks are indicated in bold in the captions below. See Appendix C for a full collection of all images used.



Figure 9: Screenshot of stimulus S1.2 Hiker Walks Away From **Woods**, source-landmark clipped



Figure 10: Screenshot of stimulus E1.5 Car Drives Towards Lake, goal-landmark clipped

3.4 Procedure

To avoid learning effects or the like, the video clips were presented in a pseudo-randomized order assuring that no two stimuli of the same condition were shown consecutively. This was achieved utilising the randomising function in *Microsoft Excel*, which generated three different orders. Since each language group consisted of 20 participants, the number of participants for each order was 7, except for the last with only 6 participants.

3.4.1 Description task

The participants were presented with the stimuli (in one of the three orders) as a presentation in *Microsoft Powerpoint*, using the video platform *Zoom*. The participants were asked to stay in a quiet room and adjust the light, i.e., to dim the light in the room or brighten the computer screen to see the stimuli well. They were also asked to have their cameras switched on for the duration of the experiment.

After a brief oral introduction with general information on the procedure of the experiment, the participant was given time for questions before being asked to read an informed-consent form

(see Appendix D). Consent was obtained orally and recorded as part of the experiment. To avoid misunderstandings, all instructions and information during the experiment were given in the participant's native language.¹⁴

Then, the participant was introduced to the first task with the following instructions that were presented on screen (here translated to English):

You will see 44 short video clips of approximately 7 seconds each. After each clip you will be asked to describe what happened in the videos. You do not have to focus on details (e.g., what a person is wearing), instead try to focus only on the event itself. You may begin describing as soon as the video clip finishes. There will be a black screen with a question mark after every clip as a sign for you to begin your description.

Unlike in previous studies on motion event descriptions, such as von Stutterheim et al. (2012), Papafragou, Hulbert and Trueswell (2008), and Becker, Ferretti, and Madden-Lombardi (2013), in the present study the elicitation question was not formulated in the present tense (*What is happening?*), but instead in the past tense: (*Describe*) *What happened (?)*. This choice was inspired by Zlatev et al.'s (2021) study on motion event descriptions where questions were formulated in the past tense, not requiring the use of the progressive aspect in Spanish (and English): Compare *¿Qué pasó? (What happened?)* with *¿Qué está pasando? (What is happening?)*. The use of the progressive aspect in the question can be expected to prime the Spanish participants to give their descriptions in the same tense and aspect. In contrast, German does not mark progressive aspect morphologically, which may lead to an aspect bias in the Spanish participants compared to the Germans and would thus be a confounding factor in the study.

Again, each participant was given time to ask questions before entering the training phase. The training consisted of three test video clips that served to let the participants familiarize

¹⁴ Von Stutterheim et al. (2012, p. 9) state that this contributes to the participants' native language being "fully activated during the experiment", although they do not specify what is meant by this. Still, introducing information in another language may interfere with the speaker's current *language mode* (Grosjean, 2001) and is best avoided.

themselves with the task. In the test phase as well as in the actual task, the slides were moved forward manually by the researcher, giving the participants enough time for their responses. After each training video clip, the participant was given brief feedback, e.g., to include less details or to focus on the main event only. Unlike in previous study designs, the participants were asked to start their descriptions only when the video had stopped, i.e., when the black screen appeared. This ensured that the descriptions given were based on the full duration of the video clip without possible distractions (e.g., missing details) due to early response onset. Then the actual experiment of 42 video clips began, which lasted approximately 10 – 15 min.

3.4.2 Memory task

After the description task, the participants were given a short 5-minute break before proceeding with the second part of the experiment: the memory task. A slide was shown with the instructions for this task, and the participants were asked to read them carefully and ask questions if needed.

In a randomized order screenshots of the critical items (Conditions S1 and E1; landmarks implied) were shown where the source-/goal-landmarks (starting and endpoints) were clipped off (see Figures 7 and 8 in Section 3.3.2 for examples). The participants were asked to name the respective landmark based on their memory. The exact instructions were as follows:

You will see 16 screenshots of some of the video clips you saw in the previous task. A part of the image is coloured black. Try to remember what was there and name it. You have 6 seconds to respond before the next image appears.

As with the description task, the participants underwent a short training phase before the actual memory task started. It consisted of three screenshots taken from video clips from the control conditions (S0 and E0). Again, this was important to ensure that the participants had understood the task instructions correctly and knew what to do, e.g., when to speak and how much information to include. The participants were informed that details, such as colour and size, were not relevant, and asked only to name the object itself with no need for reproducing full descriptions.

Unlike in the description task, the slides were moved forward automatically and were timed for 6 seconds. This gave all participants the same amount of time to respond, which would facilitate the analysis of the results and comparison between the two language groups. The participants could respond as soon as they felt ready to do so. The total duration of this task was approximately 2 minutes. After this task, the recording was stopped, and the participants were debriefed. The debriefing consisted of the following three questions, here in English translations from German and Spanish:

1. How did it go? Was it exciting/challenging/tiring/boring?
2. Could you guess what the experiment was about?
3. How did you find the memory task?

The debriefing did not only serve as a round off for the participants but was part of the 2nd-person methods applied in this study. Question 2 in particular gave interesting insights into the thoughts of the participants regarding the purpose of the study and ensured that none of these coincided with the actual purpose, which could have led to biases. I return to this in Chapter 5.

The actual purpose of the study was revealed to the participants before asking Question 3. This gave the participants the chance to reflect on their own memory performance in relation to the descriptions they provided in Task 1. As discussed in Chapter 5, many participants commented on their memory performance, giving reasons for why they remembered some items and not others. Where appropriate, spontaneous follow-up questions were asked for further clarification. After the debriefing, the participants were thanked for their participation and handed their compensation. Finally, they were kindly asked to fill in the language history questionnaire (LHQ) (see Section 3.2). This did not require the assistance of the researcher.

3.5 Data coding and analysis

3.5.1 Transcription and coding of dependent and independent variables

Upon completion of all 40 participant recordings, all target sentences were transcribed for the four conditions of the description task (T1) as well as for the responses given (for the critical conditions S1 and E1) in the memory task (T2). Descriptions of fillers were not transcribed. In the description task the target sentence was identified as the sentence that formed part of the description of the motion event itself as well as any additional sentence or phrase containing reference to the intended starting or endpoint. Phrases including superfluous information, e.g., background descriptions, hypotheses about the purpose of the figure in motion, etc., were not included in the transcriptions. Examples of target sentences are shown in (8) and (9).

(8) *Un señor mayor camina por la acera de una ciudad donde se
A man elderly walks along the sidewalk of a city where one
aprecia un supermercado a mano derecha. (Item S1.5)
sees a supermarket on hand right
'An elderly man is walking along the sidewalk in a city where there is a
supermarket on the right-hand side'*

(9) *Ein Auto fährt zum Meer (Item E1.5)
A car drives to the sea
'A car is driving to the sea'*

The sentences were transcribed in *Microsoft Excel* and ordered by participant and condition. Subsequently, all target sentences were coded according to the categories and values shown in Table 4.

Table 4: Coding of the description task (T1)

Categories	Values	Definition	Examples in DE and ES
Landmark function ¹⁵	FROM	Any preposition, verb or other expression used to express that the subject (figure in motion) is moving away from an explicitly mentioned source landmark.	DE: <i>Ein Mädchen verlässt ein Gebäude.</i> A girl leaves a <u>building</u> . ES: <i>Un hombre sale de un edificio.</i> A man comes out of a <u>building</u> .
	TOWARDS	Any preposition, verb or other expression used to express that the subject (figure in motion) is moving towards, i.e., in the direction of an explicitly mentioned goal landmark. It indicates the direction of motion, but not as the result of the motion / destination of the figure.	DE: <i>Ein Mann läuft Richtung Bushaltestelle.</i> A man is walking towards / in the direction of a <u>bus stop</u> . ES: <i>Una chica se acerca a un cajero automático.</i> A girl is approaching a <u>cash machine</u> .
	TO	Any preposition, verb or other expression used to express that the subject (figure in motion) is moving to an explicitly mentioned goal landmark. The goal landmark is construed as the destination of the figure in motion.	DE: <i>Eine Frau läuft zu einem Fluss.</i> A woman is walking to a <u>river</u> . ES: <i>Un hombre entra en un bar.</i> A man enters a <u>bar</u> .
	ALONG	Any preposition, verb or other expression used to express that the subject (figure in motion) is moving “in a line next to something (long)”. Note: landmarks were only coded as <i>along</i> if they constituted possible landmarks for the memory task, i.e., if they were covered by a black bar in the screenshots.	DE: <i>Ein Mädchen läuft am Fluss entlang.</i> A girl is walking along/by the <u>beach/river</u> . ES: <i>Un coche pasa por una gasolinera.</i> A car is driving past a <u>petrol station</u> .
	THROUGH	Any preposition, verb or other expression used to express that the subject (figure in motion) is moving from one side/end to the other of a given landmark. It may be within the confines of a landmark or transcending these, i.e., moving in one side and out of the other side. Note: landmarks were only coded as <i>through</i> if they constituted possible landmarks for	DE: <i>Ein Mädchen läuft in einem Park.</i> A girl is running through/in a <u>park</u> . ES: <i>El tranvía pasa por el túnel.</i> The tram is going through a <u>tunnel</u> .

¹⁵ This term is to some degree similar to Jackendoff's (1983) *path function* and describes how the landmark is integrated into the spatial description.

		the memory task, i.e., if they were covered by a black bar in the screenshots.	
	AT	Any preposition, verb or other expression used to express that the subject (figure in motion) is in/at a landmark. While it may or may not include motion of the figure, it does not include translocative motion.	DE: <i>Eine Frau sitzt auf einer <u>Bank</u>.</i> A woman is sitting on a bench . ES: <i>Una mujer está sacando dinero en un <u>cajero automático</u>.</i> A woman is withdrawing cash at/from a cash machine.
	0	None of the above values apply.	DE: <i>Ein Auto fährt die Straße entlang.</i> A car is driving down the road. ES: <i>Un hombre pasa por el paso de cebra y a lo lejos se ve una iglesia.</i> A man is crossing a zebra crossing and, in the distance, you can see a church.
Landmark mentioned	1	This includes the (intended) landmark established by the researcher prior to the experiment, i.e., in the creation process of the video clips, as well as any landmark self-established by the participant.	Item E1.6: A Man Walks towards Church DE: <i>Ein Mann überquert einen Zebrastreifen und geht <u>auf eine Kirche</u> zu.</i> A man is crossing a zebra crossing and heading to a church . ES: <i>Un hombre se dirige <u>hacia un paso de cebra</u>.</i> A man is heading to/towards a zebra crossing . But not: A man is walking over a zebra crossing.
	0	No landmark explicitly mentioned ¹⁶	DE: <i>Ein Mann läuft die Straße entlang.</i> A man is walking down the street. ES: <i>Una chica se sienta.</i> A girl is sitting down.
Tense	Past	Grammatical tense placing the action/situation in the past. If there was	DE: <i>Ein Mann kam aus einem Geschäft.</i>

¹⁶ The landmark may be implied, e.g., *A woman is sending off a letter*. However, these cases were coded as 0 = no landmark mentioned

		more than clause, each clause was coded for tense.	A man came out of a shop. (Past) ES: <i>Una mujer se levantó de un banco y camina por la calle.</i> A woman got up from a bench and is walking down the street. (Past/Pre)
	Pres	Grammatical tense placing the action/situation in the present time.	DE: <i>Ein Mädchen rennt zu einer Rutsche.</i> ES: <i>Una chica está corriendo hacia un tobogán.</i> <i>A girl runs/ is running to a slide.</i>
	Fut	Grammatical tense marking the action/situation as not having taken place yet, but as expected to happen in the future.	DE: <i>Jemand, der gleich durch eine Schiebetür gehen wird.</i> Somebody who is going to go through a sliding door. ES: <i>Una chica va a enviar una carta.</i> A woman is going to send off a letter.
	0	Clauses lacking a finite verb	DE: <i>Eine fahrradfahrende Frau</i> A woman riding a bicycle. ES: <i>Una chica corriendo en el parque.</i> A girl running in the park.
Imperfective aspect	morph	Aspect expressing ongoingness (imperfectivity) marked on the verb itself. In English: Progressive aspect. In Spanish: <i>estar/ir + gerundio</i> ¹⁷ Standard German lacks morphological aspect, but some non-standard forms may occur in informal speech.	DE: <i>Eine Frau ist am Wandern.</i> <i>A woman is hiking.</i> ES: <i>Una chica está corriendo.</i> <i>A girl is running.</i>
	lex	Imperfective aspect (ongoingness) expressed lexically by means of additional temporal adverbials, such as <i>right now</i> , <i>at the moment</i> , etc.	DE: <i>Ein Mann geht gerade in ein Geschäft.</i> A man goes into a shop at the moment / right now. ES: <i>Una chica está corriendo en este momento.</i> A girl is running in this very instance.

¹⁷ Other aspect forms expressing ongoingness in Spanish are the following periphrases: *andar/seguir/llevar + gerundio*. Due to their meanings, these were not expected to occur in the participants' responses, which was subsequently confirmed in the data analysis.

	0	Imperfective aspect (ongoingness) not expressed by any linguistic means	DE: <i>Ein Mann läuft zu einer Statue.</i> ES: <i>Un hombre se dirige hacia una estatua.</i> A man walks to/towards a statue.
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The memory task consisted of screenshots taken from all 16 critical items (Conditions S1 and E1) and required only a brief answer from the participant. Therefore, the entire answer was transcribed including fillers/hesitation markers, self-corrections and other additional utterances. Initially, the aim was to determine a degree of certainty of the participants with regards to their responses. However, due to the possibility of time lags on *Zoom* and difficulties in the interpretation of hesitation markers, this analysis was ultimately discarded. In the end, it was merely coded whether or not the correct landmark was mentioned, i.e., if the intended landmark was mentioned or if the landmark mentioned in the memory task matched the landmark mentioned by the same participant previously in the description task, see Table 5.

Table 5: Coding of the memory task (T2)

Categories	Values	Definition	Example
Landmark mentioned	1	Correct (i.e., intended by researcher) or self-established by the participant (i.e., construed as landmark in description task) mentioned	For item E1.8: Correct: <i>Slide/Playground</i> Previously self-established: <i>Outdoor gym</i>
	0	No or incorrect landmark mentioned	For item E1.2: Correct: <i>Bus stop</i> Mentioned: <i>Bench</i>

3.5.2 Statistical analyses

In accordance with the hypotheses, several descriptive summaries were created for selected categories. These include the verbal encoding of ongoing motion (category “aspect”) in the description task (T1), the verbal encoding of starting and endpoints (category “landmark mentioned”) in T1 and T2 (memory task) as well as the categories “tense” and “landmark

function”. Where appropriate, these descriptive summaries were complemented by the proportions (on a scale from 0 to 1) per speaker in each language (and condition). To assess whether the differences between these proportions were statistically significant, they were subsequently compared by means of t-tests. Such tests were also performed to investigate possible correlations between variables such as morphological aspect and landmark mentioning or landmark mentioning and memory.

3.6 Summary and specific hypotheses

This chapter has given a detailed description of the design and procedure of the experimental study, thus operationalizing the general hypotheses (see Chapter 2.4), which were based on both previous findings and novel predictions. Taking into account the theoretical background and the design of the present study, the following specific hypotheses could be formulated, operationalizing the corresponding general hypotheses presented at the end of Chapter 2:

- *H1. The Spanish speakers will mark ongoing motion (morphologically or otherwise) more often and thus construe the event as temporally unbounded more often than the German speakers.*
- *H2a. German speakers will more often encode starting points in the critical stimuli, i.e., where departure from the starting point is not shown but implied (Condition S1), than the Spanish speakers. There will be no such difference in the control condition (Condition S0), i.e., where departure from the starting point is shown.*
- *H2b. German speakers will more often encode endpoints in the critical stimuli, i.e., where the endpoint is not reached but implied (Condition E1), than the Spanish speakers. There will be no such difference in the control condition (Condition E0), i.e., where the endpoint is reached.*

The (visual) attention allocated to certain aspects of a scene for their verbal encoding (here starting and endpoints) is expected to have a positive effect on memory performance, irrespective of language (H4). Memory performance is predicted to be higher when the respective objects/landmarks were mentioned during the description task. Given the predictions about starting and endpoint encoding of German and Spanish speakers (H2a and H2b), the following outcome was hypothesised for the memory task:

- *H3. German speakers will more often remember the (a) starting points and (b) endpoints in the implied conditions S1 and E1 than Spanish speakers.*

However, it is also possible that the correlation between landmark-mentioning and memory does not apply for the language groups as a whole, but for individual speakers, hence:

- *H4. There will be a positive correlation between verbal encoding of landmarks and memory, irrespective of language.*

4. Results

In accordance with the specific hypotheses presented in the previous chapter, this chapter contains four sections (4.1 – 4.4), where the results are directly related to each hypothesis. Finally, section 4.5 provides a summary of the findings.

4.1 H1: Verbal encoding of ongoing motion in the description task

H1 predicted that Spanish speakers would mark ongoing motion (morphologically or otherwise) more often than the German speakers in the description task. The total numbers of markings of ongoing motion were calculated for each language group separately and are displayed in Table 6.

Table 6: Number of markings of ongoing motion per condition and language

Language	Condition	Lexical aspect	Morphological aspect	None
DE	Starting point shown (S0)	3	0	157
	Starting point implied (S1)	0	1	159
	Endpoint shown (E0)	4	0	156
	Endpoint implied (E1)	1	0	159
	Total		8	1
ES	Starting point shown (S0)	0	94	66
	Starting point implied (S1)	0	89	71
	Endpoint shown (E0)	0	79	81
	Endpoint implied (E1)	0	100	60
	Total		0	362

As predicted, the Spanish participants marked ongoing motion much more often than the German speakers: in 362 out of 640 cases with no instances of lexical aspect marking. In contrast, the German speakers marked ongoing aspect in only 9 out of 640 cases, with one case of

morphological and eight cases of lexical aspect marking. Given these clear results, the proportions of morphological aspect marking across the four conditions were calculated only for the Spanish group. These are displayed in Figure 11.

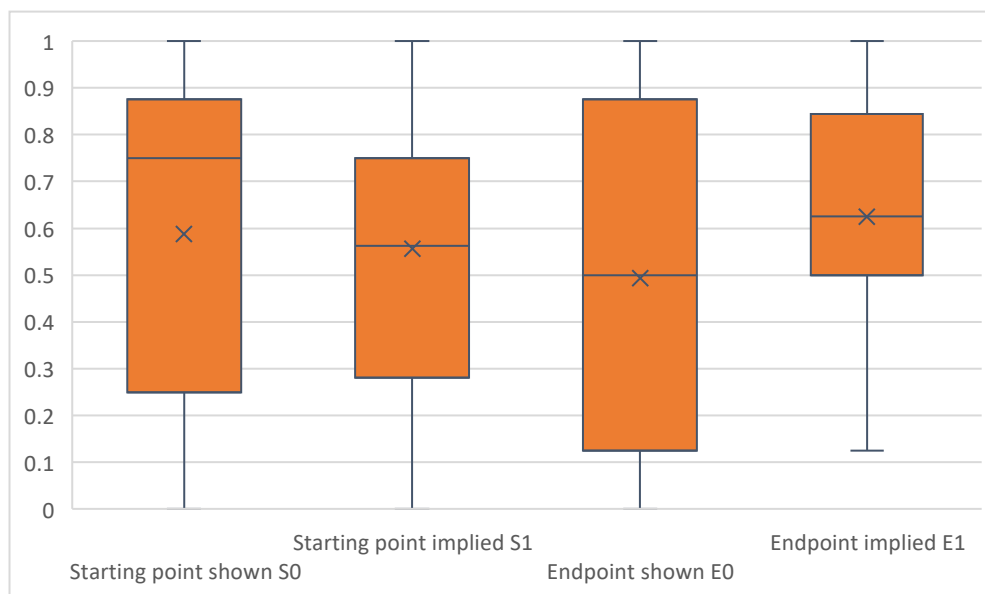


Figure 11: Proportions¹⁸ of morphological aspect marking per condition in the Spanish group

Figure 11 shows the proportions of aspect marking for all 20 Spanish participants per condition. The lines below and above the boxes show the lowest and highest 25% of all individual proportions, the boxes themselves represent the middle 50%. The height of the boxes is referred to as the interquartile range (IQR) and, considered in relation to the cross, the mean value, offers information about the spread of the data from the mean. Finally, the horizontal line in the boxes represents the median, which is usually close to the mean. The boxplots offer additional information about morphological aspect marking on a participant level which is not inferable from the total numbers shown in Table 6.

The boxplots in Figure 11 as well as the total numbers in Table 6 show that morphological marking of ongoing motion was more or less similar between Conditions S0 and S1, but slightly

¹⁸ All proportions are presented on a scale from 0 to 1 where 0 indicates total absence and 1 total presence (100%) of the variable measured. Values between 0 and 1 indicate the percentage to which the variable was present.

more frequent for Condition E1 compared to E0, which is indicated by a bigger IQR of E0. This observation was tested by means of two paired samples t-tests comparing S0 and S1 as well as E0 and E1. The former showed no significant difference between the two means ($t = 0.526$, $df = 19.0$, $p = 0.605$). The difference between E0 and E1, however, was significant ($t = -3.20$, $df = 19.0$, $p = 0.005$), indicating that the Spanish participants marked ongoing motion significantly more in Condition E1 (endpoints implied) than in the control condition E0. This result was unexpected and is hard to explain, but it should be pointed out, as it reflects possible differences in construal even *within* languages, depending on the type of situations that are being described.

In sum, H1 was strongly supported, with Spanish speakers construing the events as temporally unbounded (T-unbounded) much more often than the German speakers. However, this says nothing about Q-boundedness, reflected on whether a landmark is mentioned or not (Croft, 2012; Zlatev et al., 2021). Figure 12 shows the distribution of the proportions of how often the Spanish speakers marked morphological aspect in combination with a landmark and without a landmark. It shows that Spanish speakers used morphological aspect for T-unboundedness more often when they did not encode a landmark than when they did. Thus, in this particular case there is a certain correlation between T- and Q-unboundedness.

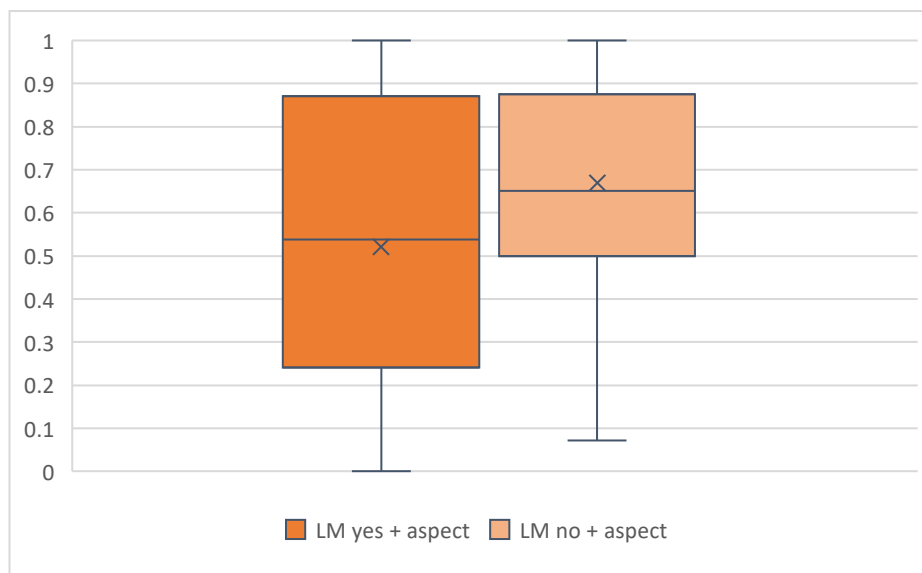


Figure 12: Proportions of morphological aspect marking in relation to landmark (LM) mentioning in the Spanish group

A paired samples t-test confirmed that the difference shown in Figure 12 was significant ($t = -2.93$, $df = 19.0$, $p = 0.009$). These numbers suggest a negative influence of the expression of ongoing morphological aspect on landmark mentioning. However, the mean percentages (52%:67%) also show that this is not always the case; while speakers may be influenced to disregard the landmark by morphologically marking ongoingness, they are not obliged to do so. This shows, once again, that T- and Q-boundedness are semantic dimensions that are *essentially* independent of one another. These conclusions are further supported by the results of landmark mentioning in Section 4.2.

4.2 H2: Verbal encoding of landmarks in the description task

The second specific hypothesis concerned the verbal encoding of starting points (H2a) and endpoints (H2b) in the description task. Following the logic of previous studies (see Section 2.4), it was expected that German speakers would more often encode starting and endpoints in the critical conditions S1 (starting point implied) and E1 (endpoint implied) than the Spanish speakers. Table 7 shows the results, with the critical conditions S1 and E1 in italics.

Table 7: Number of landmarks mentioned per language and condition

Language	Starting point shown (S0)	Starting point implied (S1)	Endpoint shown (E0)	Endpoint implied (E1)	Total
German	139	<i>54</i>	150	<i>89</i>	432
Spanish	137	<i>71</i>	145	<i>80</i>	433

As can be seen in Table 7, the total numbers of landmarks mentioned in the two language groups were almost identical. However, the numbers for the different conditions offer a more differentiated picture, with higher numbers for Spanish for S1, and for German for E1. To investigate whether there were significant differences across the conditions between the two

participant groups, the proportions of landmarks mentioned were calculated for each language and condition, as shown in Figure 13.

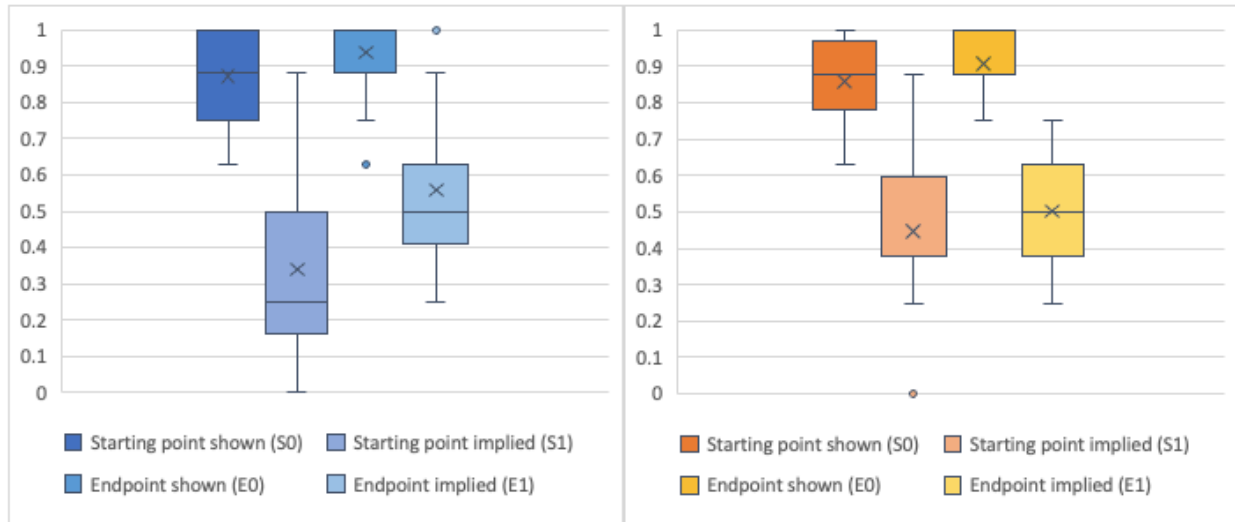


Figure 13: Proportions of landmarks mentioned in the German (blue coloured) and Spanish (orange coloured) group

Comparing the two sets of landmark proportions of the German and Spanish speakers in Figure 13, there seems to be little difference between the two speaker groups within each condition, and this was supported by statistical tests shown in Table 8.

Table 8: Results of *t*-tests comparing the proportions of landmarks mentioned per condition between the two language groups

	t-value	Degrees of freedom	p-value
Starting point shown (S0)	0.275	38.0	0.785
Starting point implied (S1)	0.927	38.0	0.360
Endpoint shown (E0)	-1.511	38.0	0.139
Endpoint (E1)	1.030	38.0	0.310

While no significant difference between the two language groups was expected for the control conditions S0 (starting point shown) and E0 (endpoint shown), the fact that there was no

significant difference between the language groups in the critical conditions with respect to the explicit landmark mentioning implied that H2 was refuted, for both starting and endpoints. In other words, while the results for H1 showed that linguistic construal differed in terms of T-boundedness, there was no difference in Q-boundedness, with regards to the factor “landmark mention”.

But perhaps there could have been some other reflection of qualitatively (Q) bounded motion in the data? While Q-boundedness is most apparently expressed through the mentioning of a landmark (source or goal) marking a start or end of a motion event, the *landmark function* (see Table 4) used to *integrate* the landmark in the motion event description may achieve a higher or lower degree of Q-boundedness.

For that reason, the landmark functions, and in particular the contrast between TO on the one side, and TOWARDS or ALONG on the other, was considered. Blomberg (2014), for example, regards the former as a type of *bounded translocation*, while the latter as *unbounded translocation*. Thus, differences in the integration of the landmarks were checked by counting the total number for each landmark function and comparing these between the two languages. This was only done for Condition E1 (endpoints implied), as no difference could be expected for the control conditions (S0 and E0, starting and endpoints shown) nor for Condition S1 (starting points implied) where FROM was the only landmark function available to integrate the starting point of the figure.

Table 9 therefore only shows the total numbers and percentages of landmark functions used in Condition E1, where the participants were free to linguistically construe the motion events as they wished and thus where language-specific differences are possible. The results of the t-tests did not reveal a significant difference for TO ($t = 1.08$, $df = 38.0$, $p = 0.286$), TOWARDS or ALONG ($t = -0.266$, $df = 38.0$, $p = 0.790$). These results indicate that both languages have similar patterns of conventional linguistic construal in terms of Q-boundedness as expressed through the landmark function when describing such motion events.

Table 9: Total numbers and percentages (highlighted in grey) of landmark functions used in E1 per language

		TO		TOWARD		ALONG		Other/None		Total	
German	Percentage %	39	43	32	35	13	15	6	7	89	100
Spanish	Percentage %	26	33	27	34	17	21	9	12	80	100

A final feature that could possibly reflect a difference in boundedness in the two groups, (actually more a matter of the expression being T-bounded than Q-bounded) is that of tense, which is known to interact closely with aspect (Croft, 2012). Table 10 shows how tense was distributed in the descriptions for the two languages, with Past being most compatible with a bounded construal, all the others with unbounded construal.

Table 10: Total numbers of tenses used in E1 per language

	Past	Present	Future	None	Past/Present	Present/Future ¹⁹
German	31	594	1	5	9	0
Spanish	14	254	14	345	11	2

As can be seen, both speaker groups linguistically construed the motion events as more unbounded (with regards to tense) in approximately 94 % of the cases. In sum, despite all efforts, no significant differences between the languages were found in terms of Q-boundedness, or other forms of T-boundedness, apart from that reflected in morphological aspect, discussed in 4.1.

4.3 H3: Verbal encoding of landmarks in the memory task

Task 2 of the experiment consisted of a memory task featuring screenshots of the critical items (Conditions S1 and E1; starting and endpoints implied) where the participants were asked to name the respective landmark if they remembered it. On the basis of the background literature, H3 stated that the German speakers would more often remember (a) starting points and (b) endpoints in the

¹⁹ Target utterances consisting of two sentences were coded for each tense individually.

critical conditions than Spanish speakers. The total numbers per language and condition are shown in Table 11 and the individual proportions are depicted in Figure 14.

Table 11: Landmarks remembered in the memory task (T2) per language and condition

Language	S1 (starting point implied)	E1 (endpoints implied)	Total
German	93	101	194
Spanish	123	110	233

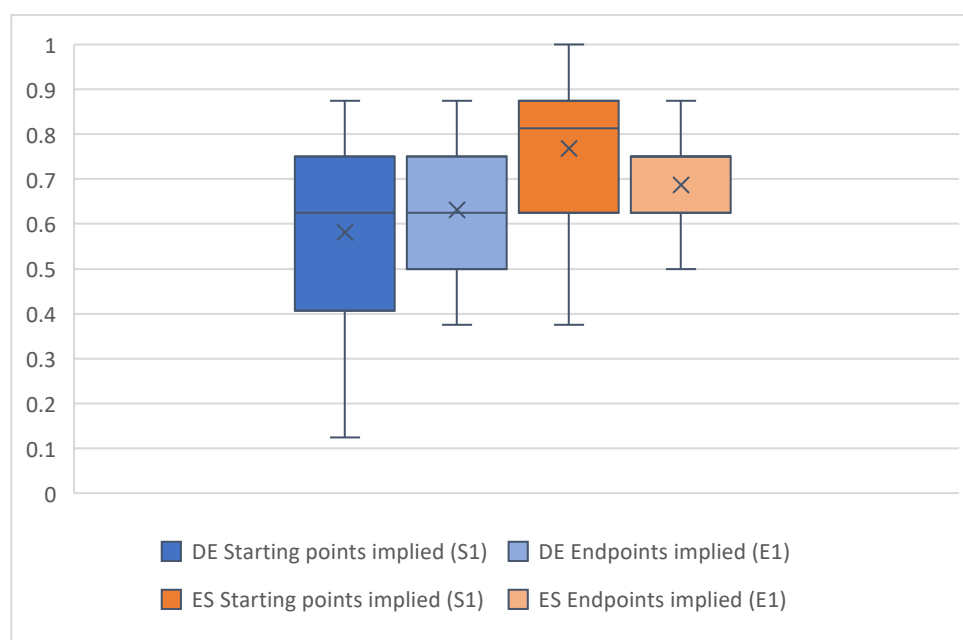


Figure 14: Proportions of landmarks remembered per language and condition

These data show that in each condition the Spanish group performed better on the memory task than the German participants. To check for statistical significance of these values, an independent samples t-test was performed for each of the critical conditions comparing the two language groups. The results for Condition S1 (starting points implied) revealed a significant difference between the German and the Spanish speakers' memory performance ($t = -3.00$, $df =$

38.0, $p = 0.005$). No significant difference was found between the two language groups for Condition E1 (endpoints implied) ($t = -1.22$, $df = 38.0$, $p = 0.231$). Thus, the Spanish speakers remembered more landmarks than the German speakers in both conditions, and in Condition S1, this difference was statistically significant. These results do not support specific hypothesis H3.

4.4 H4: Correlations between verbal encoding of landmarks and memory performance

H4 predicted a positive correlation irrespective of language between the verbal encoding of landmarks in the description task (T1) and remembering of these in the memory task (T2). To check for such a correlation, the number of landmarks mentioned in T1 and remembered in T2 (MR) was compared to the number of cases where the landmark was not mentioned in T1 but remembered in T2 (NR). In total, in 248 out of 640 cases the landmark was mentioned and remembered and in 179 out of 640 cases the landmark was not mentioned but remembered. The distributions of the individual proportions for these two categories are presented in Figure 15.

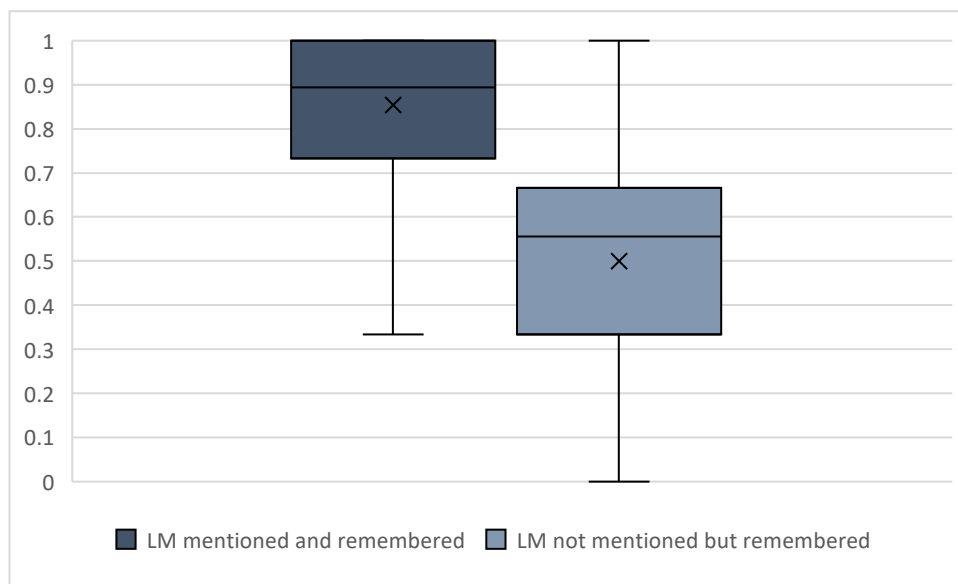


Figure 15: Proportions of landmarks (LM) mentioned in T1 and remembered in T2, and proportions of landmarks not mentioned in T1 but remembered in T2 irrespective of language

A paired t-test revealed a significant difference between the number of landmarks mentioned / not mentioned and remembered ($t = 8.26$, $df = 39.0$, $p = <0.001$). Thus, there was an overall positive correlation between landmark mentioning and remembering irrespective of language, confirming H4.

A positive correlation could also be confirmed when analysing the languages individually. The total number of landmarks mentioned and remembered was 113 in the German and 135 in the Spanish group compared to the total number of landmarks not mentioned but remembered which was 81 in the German and 98 in the Spanish group. While the total numbers indicate a better overall memory performance of the Spanish speakers, they do not offer information about the individual performance of the participants. Therefore, the individual proportions were calculated and are presented in Figure 16.

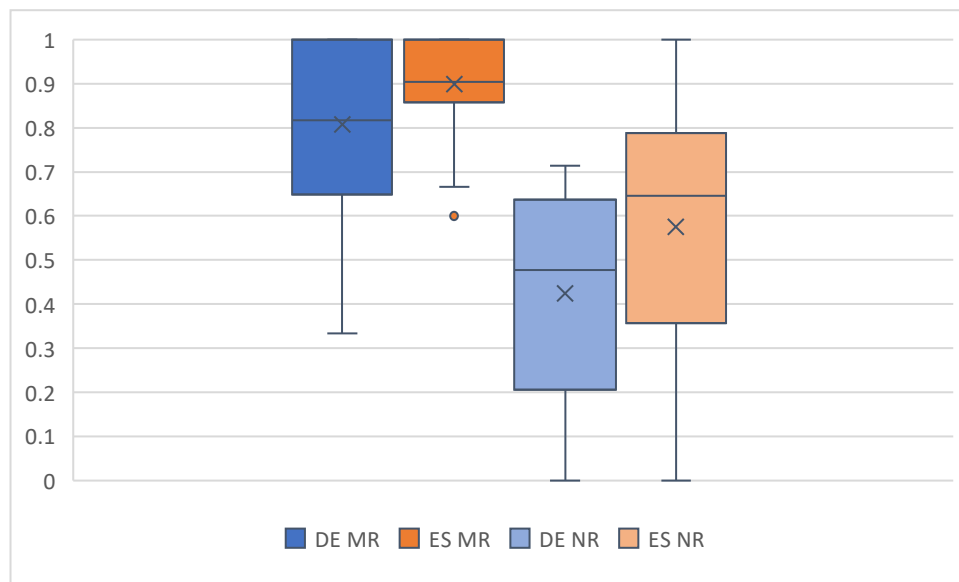


Figure 16: Proportions of landmarks mentioned in T1 and remembered in T2 (MR), and proportions of landmarks not mentioned in T1 but remembered in T2 (NR) per language

Figure 16 shows that the numbers of landmarks that were mentioned in the description task and remembered in the memory task were higher in both languages than the number of landmarks that were not mentioned but remembered. This was confirmed by two t-tests with identical results

in both language groups ($t = 5.82$, $df = 19.0$, $p = <0.001$). Comparison of the two categories (MR and NR) between German and Spanish did not reveal a significant difference (MR: $t = -1.79$, $df = 38.0$, $p = 0.082$; NR: $t = -1.93$, $df = 38.0$, $p = 0.061$).

These results suggest that a positive correlation between landmark mentioning and memory can be found both irrespective of language as well as on a language-specific level. The lack of significant differences between the two language groups is rather unsurprising considering that both mentioned a similar number of landmarks in the description task. Finally, the relatively high number of landmarks not mentioned but remembered suggests that factors other than language may also affect memory (of the landmarks).

4.5 Summary

Analysis of the data obtained in the experiment clearly confirmed H1, as the Spanish speakers indeed marked temporal (T) unboundedness more often than the German participants. In the Spanish group this was achieved exclusively through the use of morphological aspect. Only in 9 cases did the German speakers use lexical means or non-standard morphological aspect to express ongoingness.

The second hypothesis (H2), which predicted significant differences between the two language groups with regards to the number of landmarks mentioned in the critical conditions, i.e., greater Q-boundedness, was not confirmed. Both participant groups mentioned a similar number of landmarks in the four conditions, and there were no significant differences with regards to landmark functions (TO vs. TOWARDS/ALONG) or tense.

Analysis of the data obtained in the memory task revealed that, contrary to the predictions of H3, there was no significant difference between the language groups in the endpoint condition E1 and the Spanish participants even performed better than the Germans in the starting point condition S1.

Finally, a positive correlation between landmark mentioning and memory was found both irrespective of language and for the two languages separately. Participants who mentioned the landmark in their descriptions were also better able to remember it than those who did not.

5. Discussion

In this chapter, the findings presented in the previous chapter are interpreted and discussed in relation to both general and specific hypotheses, the theoretical background including previous studies and the overall study design. The chapter is structured in accordance with the three central objects of analysis: Section 5.1 is concerned with the linguistic construal of ongoingness, Section 5.2. discusses the differences observed between the languages with regards to landmark mentioning and Section 5.3 turns to the influence of language on memory. Finally, Section 5.4 provides a summary.

5.1. Linguistic construal and boundedness

As predicted, the Spanish participants construed more events as temporally (T) unbounded (ongoing), by means of the morphological *imperfective* aspect, than the Germans. For the latter, there were only 9 out of 640 cases when they did mark ongoingness lexically. Notably, this large difference was found despite the efforts to avoid a possible bias towards the use of morphological aspect in the Spanish group by the formulation of the task question in the past tense: *What happened?* and not *What is happening?*, where the latter question may have encouraged increased aspect marking.

As discussed in Section 2.4, a number of previous studies (e.g., Flecken, 2011; von Stutterheim et al, 2012; Flecken, von Stutterheim and Carroll, 2014, Bylund and Jarvis, 2011) have claimed that such differences should influence landmark mentioning along the following reasoning: the use of morphological imperfective or progressive aspect directs more attention to the process/activity and less to other aspects such as (goal-)landmarks. However, these studies did not make the crucial distinction between Q-boundedness and T-boundedness. Following Croft's (2012) two-dimensional model of aspect, two events may be equally construed as Q-bounded, e.g., *She drove to town* and *She was driving to town*, but differ in T-boundedness; the former construal

is T-bounded, while the latter is not. Applying this distinction to von Stutterheim et al.'s (2012) study, the researchers conclude that the use of imperfective morphological aspect (T-unbounded) encourages the speakers to construe the event also as Q-unbounded. While some of the findings seem to confirm this hypothesis, others did not (see Section 2.4).

To obtain a more complete picture of the influence of these two factors, the present study analysed a possible correlation between these two variables. Within the Spanish group, the number of cases of (a) LM mentioned (Q-bounded) + aspect (T-unbounded) was compared to the number of cases of (b) LM not mentioned (Q-unbounded) + aspect (T-unbounded). While the results showed a certain correlation between morphological aspect (T-unbounded) on not mentioning the landmark (Q-unbounded), the relatively high percentage of landmarks mentioned along with imperfective aspect shows that both options are available to the speaker and, in fact, rather commonly used. This refutes the assumption of conflating T and Q-boundedness; rather, they should be treated as independent factors, even if they may influence one another.

These findings strongly contradict a direct causal relation between language and thought along the lines of linguistic determinism, where the use of a linguistic structure (here, morphological aspect) forces the speakers to pay more or less attention to another aspect of a situation (here, landmarks). In terms of the different levels of construal, this means that conventional construal cannot affect psychological construal *directly*. As a feature of conventional construal, morphological aspect may *influence* the speakers to varying degrees with regards to landmark encoding, which can be seen as an aspect of pragmatic construal. This could potentially affect psychological construal, for example, with respect to memory, as investigated in the other hypotheses.

5.2 Differences in terms of landmark mentioning

As pointed out above, there were no differences in terms of Q-bounded construal between the language groups. If anything, the individual proportions showed that the German speakers mentioned *fewer* endpoints per participant in the control condition E0 than the Spanish speakers.

Again, these data contrast with previous studies (e.g., von Stutterheim et al., 2012) where a difference was observed between the two language groups for goal-landmark encoding in the implied condition E1. However, the findings of the present study are similar to a study by Bepperling and Härtl (2013) who did not detect any difference between German (no “standard” morphological aspect) and English (morphological aspect).

A possible explanation for these results may be sought in the overall study design and the operationalizations of key concepts, which were not identical to the study by von Stutterheim et al. (2012). Content and presentation of the video clips as well as the fewer number of filler items in the present study may have affected the speakers’ responses. However, the material and procedure were the same for both language groups and it therefore seems reasonable to assume that any influence of the study design itself would have affected German and Spanish speakers alike.

As one of the 2nd-person, intersubjective methods applied in this study (see Section 2.1.2), the debriefing at the end of each experiment gave valuable insights into the participants’ evaluation of the two tasks and reflection on their own performance. One aspect that was pointed out by several participants in both language groups was that the action depicted in the video clips was very similar, i.e., there was always a figure moving from A to B, and that this eventually encouraged them to vary their descriptions by including more landmarks. For example, a Spanish participant commented as shown in (10).

(10) *Yo observé que siempre había una persona caminando y caminando, de un lado para otro, y siempre era lo mismo. Por eso empecé a decir de dónde viene y a dónde va. Que si no, hubiera dicho siempre lo mismo.*

‘There was always somebody walking which is why I started saying where they came from and where they went. Otherwise, I would have said the same thing all the time.’

Other participants in both languages commented that they adhered closely to the task instruction and therefore tried to focus solely on the action itself and less on other details. One German participant stated as given in (11), and another as in (12).

(11) *Ich dachte, man soll darauf achten, was passiert, deswegen hab ich nicht mehr auf die Situation konzentriert und gar nicht so sehr auf das Umfeld.*

‘I thought the task was to describe what happened, which is why I focused on the situation and less on the surroundings.’

(12) *Ich hab immer ein bisschen gezögert, sag ich das jetzt oder nicht, brauchst du das oder nicht.*

‘I kept doubting, shall I say this or not, is this necessary or not.’

Although none of the participants guessed the actual purpose of the study, some thought it may have to do with only describing what is actually observed, as indicated in the comment by a German participant in (13).

(13) *Ich dachte, es geht darum, zu sehen, ob die Leute sagen, etwas ist passiert, was aber in den Videos gar nicht passiert ist.*

‘I thought it was about seeing whether the participants said something had happened that did not actually happen in the videos.’

In a similar line, others commented that they did not want to say things they had not actually observed. The opposite tendency was observed in a German participant who assumed the experiment was about vocabulary and therefore mentioned more details.

Finally, a few participants also mentioned that the video clips were too short to focus on all the details and that they only included information that, in their opinion, seemed particularly relevant or most noteworthy. Similarly, a Spanish participant also commented in (14) on the likelihood of the figure actually reaching a goal-landmark in the implied condition E1. Thus, it seemed that at least in some cases, whether or not the speaker finds it likely or obvious for the figure to leave a certain starting point or reach an endpoint influenced their decision to include these landmarks in their descriptions.

(14) *Me fijaba más en lo que estaban haciendo, sobre todo en los del campo donde no estaba claro a dónde iban porque todo estaba muy lejos.*

I focussed more on what they were doing, especially the ones in the countryside where the landmarks were quite far away, and it didn't seem so obvious where the person was heading.

All these aspects may have influenced the responses given in this task to varying degrees and should therefore be taken into account, both for the current experiment and for future studies. However, it should also be noted that the conditions of the experiment were identical for both participant groups and any influence of the above factors will most likely have affected German and Spanish speakers alike.

Turning to the theoretical implications of the findings, it can be concluded that landmark mentioning does not solely depend on the linguistic structures of a language (corresponding to the conventional/semantic level of construal, see Section 2.2), in this case morphological aspect (see previous Section 5.1.1.1), but also on many other factors. These correspond to the situated/pragmatic level of construal and include task instructions, relevance of the information to be communicated as well as the interlocutor/audience, among others. All these decisions influence the speaker's overall construal of a given situation. To reiterate, the motion events depicted in the video clips were identical for all participants and served as substitutes for the corresponding situations in reality. Crucially, it is up to the speaker to choose how to construe these situations: conventionally, pragmatically, and psychologically.

With respect to conventional construal, different languages offer different means of representing the same situation. One example of such a difference in linguistic means is morphological aspect in Spanish, which does not exist in standard German. This, however, does not impede an event being construed as ongoing in German if the situation required it. While certain linguistic structures may be obligatory for correct language use, it is always possible to add extra information if necessary. Language is not a "prison" for its speakers and ultimately every concept can be expressed in any language (e.g., Deutscher, 2010).

Applying these considerations to the present study, the results of the description task imply that morphological aspect indeed seems to negatively affect landmark mentioning (in the Spanish group), although not in all cases. In fact, there was a relatively high number where the landmark was mentioned despite the expression of ongoingness. However, regardless of the presence or absence of morphological aspect, in general and in a particular utterance, speakers (of both German and Spanish) are not forced to include or disregard landmarks in their descriptions if they do not wish to. In other words, speakers may focus more on temporal unboundedness, and therefore possibly more on the action itself, and may or may not disregard the landmark, but they are not obliged to do so.

5.3 Influence of language on memory

Since the German participants did not express more landmarks than the Spanish speakers, it was no longer surprising that they would not overperform in terms of memory of these landmarks. As pointed out, in the starting point condition (S1) the Spaniards even outperformed the Germans. Again, these findings may be considered surprising when considered in relation to previous studies such as von Stutterheim et al. (2012) and Flecken, von Stutterheim and Carroll (2014), but rather intuitive in the current study, given the differences between different kinds of construal (5.2) and boundedness (5.1) discussed earlier.

The diverging results in previous studies may partially be explained by the different analyses applied. For example, von Stutterheim et al. (2012) compared the relative frequencies of landmarks mentioned per language as well as the relative frequencies of landmarks remembered but did not analyse a correlation between the two.

Given that mentioning a landmark or not is a matter of pragmatic construal, it remains under the influence of a number of different factors that cannot all be controlled. Still, on the whole, one can still expect a correlation between landmark mention and memory, and this was indeed found in both language groups. However, the relatively high number of landmarks not mentioned but remembered (179 out of a total of 428 that were remembered) indicate that there are factors other than language that can influence memory performance.

The debriefing of the participants after the experiment pointed towards other factors that may have exerted a greater or lesser influence on the participants' memory performance. One aspect that seemed to make it more difficult to remember the landmarks was the perceived similarity of the video clips. A German participant commented in (15).

(15) *Ich fand es schwieriger, mich an unwichtige Gebäude zu erinnern [...], es ist leichter, sich an spezifische Orte zu erinnern.*

'I found it harder to remember insignificant buildings [...], it's easier to remember specific landmarks.'

Another German participant also pointed out that video clips with various objects (and therefore several possible landmarks) were more difficult to remember, especially when the colours were also similar. Yet others found the length of the video clips too short to focus on details such as landmarks and thus, had difficulties remembering them.

On the other hand, several participants highlighted that some screenshots also contained hints that facilitated memory of the landmarks. A Spanish participant mentioned that in some cases the clothes of the figure and the surroundings helped him make the association. Other participants pointed out that (clear) goals were easier to remember than starting points, as predictions about goals seem more intuitive than points of departure.

Finally, various participants in both language groups claimed they had very good memory. A Spanish participant even claimed that she had an almost photographic memory, and another commented that he played video games on a regular basis and was therefore used to focussing on different details and retaining these in memory. Especially in those cases where the participant had mentioned very few landmarks in T1 but remembered many in T2 the participants claimed that they very much perceived the landmarks when watching the video clips but did not include them in their description for different reasons. On the other hand, some participants reported the opposite, namely that they had very bad memory and usually scored low on memory tasks, regardless of whether they had mentioned the landmarks before. Importantly, although the participants who claimed to have good/bad memory tended to score high/low on the memory task,

there were several cases in both groups where the performance in Task 1 did not coincide with the performance in Task 2.

The above points highlight several important factors that may have influenced the participants' ability to remember the target landmarks other than their verbal encoding in the description task. Taking into account the results of the correlation tests, it can be concluded that, in general, there is indeed a correlation between speaking (landmark mentioning) and thinking (memory), but it is more on an individual, person-specific level. Thus, language does not have a direct effect on memory, i.e., speakers do not automatically remember better solely because they have mentioned this information before. Nevertheless, language may positively *influence* and enhance memory to varying degrees. In this sense, one could argue for a weak form of linguistic relativity in this domain. However, our memory is also influenced by several other factors that may override the influence of language completely.

5.4 Summary

The discussion of the findings highlighted that the expression of motion event boundedness, both in its temporal (T) and qualitative (Q) aspects, is a matter of linguistic construal that can be influenced by different factors, only one of which is the presence or absence of morphological aspect that encodes ongoingness, such as the *imperfective* in Spanish. The analyses suggest that the latter does indeed influence landmark mentioning negatively, as claimed by previous studies, but not to an extent that leads to significant differences between the languages in this respect. Thus, T-boundedness and Q-boundedness of a motion event description are factors that are essentially independent from each other and may be freely combined, as preferred by the speaker in their act of pragmatic/situated construal. While conventional construal may be an influencing factor for pragmatic construal, various language-external factors may influence the linguistic construal of a situation and motivate the speaker to include or disregard landmarks. Thus, differences are to be expected on the participant level.

Likewise, memory of the landmarks in question seems to be influenced by several factors other than language (like landmark mentioning). While there seems to be an overall positive correlation between landmark mentioning and landmark remembering, the disparity between psychological and linguistic construal as well as several other factors may influence our memory. Again, differences in landmark remembering may be sought on an individual level rather than between languages.

6. Conclusions

With the help of cognitive semiotics, this thesis has contributed to research on linguistic relativity in the domain of motion event construal. It explored a possible influence of language and more specifically that of pragmatic (situated) construal of motion events, in terms of the expression of qualitative (Q) boundedness by explicit mentioning of landmarks, on memory for these landmarks. Previous studies (e.g., von Stutterheim et al., 2012; Flecken, von Stutterheim and Carroll, 2014) have claimed that speakers of languages with morphological aspect for the expression of ongoingness (e.g., *imperfective* or *progressive* aspect) tend to focus more on the activity itself and less on other details such as possible endpoints, in comparison with speakers of languages without such linguistic structures. Further, they have proposed that the verbal encoding of endpoints enhances the speaker's memory of these, suggesting a positive correlation between these factors (lack of morphological aspect > more landmark mentioning > better memory of landmarks) and thus a case of linguistic relativity. The present thesis has shown that the relations between the factors in question is much more complex than claimed by such studies.

The overarching research question that guided the thesis was: How should the relation between linguistic and experiential/conceptual construal be understood? In line with the cognitive-semiotic framework of this thesis, this was integrated into the *conceptual-empirical loop* (Zlatev, 2015) leading to the following research questions

- 1) What kinds of construal are there and what are their interrelations?
- 2) Do Spanish and German speakers construe motion events differently in language?
- 3) If so, do such linguistic differences influence the way they remember the events in question?

Starting on the empirical side, question 2 was addressed by means of an elicitation task where speakers of both languages were asked to describe different motion events. The findings showed that German and Spanish speakers *linguistically* construed such events both similarly and differently. Regardless of whether the landmark was shown in the video clip or only implied, both

language groups mentioned a similar number of starting and endpoints and thus showed no differences in terms of pragmatic construal, i.e., in terms of landmark mentioning (Q-boundedness), in their motion event descriptions. From the participant debriefings several factors were identified that seemed to influence the speakers' decision of whether or not to include a landmark in their description. These include task instructions, relevance of the information, likelihood of a landmark to be the source or goal of the figure, similarity or saliency of different aspects of the depicted scenes as well as length of the scenes. But all these were factors applied to the speakers as individuals, independent of the language that they spoke.

At the same time, a clear difference between the two groups was observed in the marking of ongoing motion, i.e., as temporally (T) unbounded. The Spanish speakers expressed this much more often than the German speakers, as expected due to the presence of imperfective morphological aspect in their language. Combined, the analyses showed that T-unbounded morphological aspect does seem to have a negative effect on landmark mentioning, and thus correlates with Q-unboundedness. However, this effect did not influence the overall number of landmarks mentioned and, in fact, in a relatively high number of cases, the presence of morphological aspect did not interfere with landmark mentioning. This underscores the importance of distinguishing between T-boundedness and Q-boundedness of a motion event description (Croft, 2012), contrary to what has been suggested in previous studies.

Given that both language groups mentioned a similar number of landmarks, question 3 required re-thinking. The results showed that contrary to the findings of previous studies, the German and Spanish speakers remembered equally many landmarks in the endpoint condition, while in the starting point condition, the Spanish speakers remembered significantly more landmarks than the Germans. Overall, a positive correlation between landmark mentioning and memory was found irrespective of language as well as for the languages individually. From these results it can be concluded that language use does indeed have a positive influence on memory. However, the latter may also be influenced by factors other than language and the individual proportions suggest that such an influence takes place on an individual rather than on a language level, once again emphasising our (constrained) freedom as speakers and thinkers as individuals.

Turning back to the conceptual side of the loop, the findings of the study underscore once again that more than one kind or level of construal needs to be considered, and that there is no one-to-one relationship between these levels (question (1)). Following Möttönen (2016) and Zlatev (2018), it is necessary to acknowledge the *psychological construal* of a situation, based on our subjective experience and perception of the situation. This then affects the way we choose to construe a situation in communication: *pragmatic construal* of the situation, adapted for the task at hand, and for the interlocutor, therefore influenced by what the speaker deems necessary and appropriate. It is on this level where the participants in the experiment had to make choices about how to describe the motion events and whether to integrate the landmarks and if so how. The cases of landmarks not mentioned but remembered illustrate this disparity between psychological and pragmatic construal: Memory of the landmarks shows that these were perceived by the speakers (psychological construal) but not encoded in language (pragmatic construal).

Linguistic construal on the pragmatic level is again influenced by the third level of construal, namely the conventional (semantic) level. On this level, conventional meanings and recurrent linguistic structures have become *sedimented* in language over time. One such linguistic structure that has become conventionalized in Spanish is imperfective morphological aspect. But again, linguistic construal on this level does not determine how the other two levels of construal of a certain situation will be realised; it can only influence them. An example of this is the high variation in the use of morphological aspect in the Spanish group, and the relatively weak correlation between the use of morphological aspect and lack of landmark mentioning. Thus, it can be concluded that conventional construal of a situation may influence, but does not determine pragmatic and psychological construals, and that sedimented linguistic structures do not impede their speakers from attending to other aspects of a situation.

These considerations have important implications for the relation between language and thought. While landmark mentioning had an overall positive effect on landmark remembering, language use (verbal encoding of landmarks) was not the only influencing factor for enhanced memory – sometimes it had no influence at all (cases of landmarks not mentioned but remembered and cases of landmarks mentioned but not remembered). Importantly, the positive effects of landmark mentioning on memory occurred on an individual than on a language-specific level.

Hence, in the domain of motion event construal, language (both semantic and pragmatic construal) may be said to influence but not to determine thought, e.g., memory, to varying degrees depending on context. This amounts to a relatively weak form of linguistic relativity.

Future studies are bound to cast more light on these conclusions, both empirically and theoretically. Methodological limitations of the present study may be found in the video items where colour, size and likelihood of source-/goal-landmarks may have influenced both landmark encoding and memory. Also, the number of target items and fillers could have had an effect on attention/concentration of the participants and therefore on their descriptions, e.g., similar events encouraging the participants to vary their descriptions. Finally, the length of the video clips and screenshots may also have an influence on the responses. These shortcomings should be considered for future research in this area to reduce the number of influencing factors.

In sum, this thesis has contributed to research on linguistic relativity in the domain of motion event construal by offering new insights into the similarities and differences in different kinds of construal, and their influence on memory in a study comparing speakers of German and Spanish. Cognitive semiotics has provided an appropriate framework for both a theoretical and an empirical exploration of the concept of (linguistic) construal. In particular, the questions asked in the debriefings as a 2nd-person method gave valuable insights into the participants' own assessment and reflections, which offered a more accurate interpretation of the results. Finally, with its conceptual and empirical questions and findings concerning different types of construal and boundedness it contributes to extending the scope of the field of cognitive semiotics.

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Appendices

Appendix A – Recruitment ads posted on Facebook (English translation)

Looking for participants for my Master's thesis

Hello!

For my Master's thesis in Language and Linguistics at Lund University, I am looking for participants for an intriguing language experiment. All participants will receive a 5 € Amazon voucher as a thank you, which can be used nationwide. The experiment lasts about 30 minutes and will take place on Zoom. It consists of a series of video clips that you will be asked to describe, a memory task and a short language background questionnaire. As participants, you are of course completely anonymous.

Participant requirements (for Spaniards in bold):

- Over 18 years old
- German as mother tongue / first language / **Spanish as mother tongue / first language**
- Not fluent in a Romance or Slavic language / **Germanic language**
- Live in Germany and use German on a daily basis / **Live in Spain and use Spanish on a daily basis**
- Not currently studying linguistics or psychology or have done so in the past

If you have a free moment and wish to participate in this experiment, or know someone who could be interested, please feel free to send me a message or contact me by email.

Lauratimm.ise@gmail.com

Thank you!

Appendix B – Language History Questionnaire (LHQ) (English translation)

Language History Questionnaire 3

1.Participant ID number

2.Age

3.Gender

Select a ▾

4.Education

Select a ▾

5.Parents' Education

Father

Mother

Select a ▾

Select a ▾

6.Handedness

Select a ▾

7. Indicate your native language(s) and any other languages you have studied or learned, the age at which you started using each language in terms of listening, speaking, reading, and writing, and the total number of years you have spent using each language.

Language	Listening	Speaking	Reading	Writing	Years of use*
? Selec ▾	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
? Selec ▾	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
? Selec ▾	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
? Selec ▾	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

*Notes For "Years of use", you may have learned a language, stopped using it, and then started using it again. Please give the total number of years.

8. Rate your current ability in terms of listening, speaking, reading, and writing in each of the languages you have studied or learned (including the native language). [?](#)

Language	Listening	Speaking	Reading	Writing
? Select an option	Select an option	Select an option	Select an option	Select an option
? Select an option	Select an option	Select an option	Select an option	Select an option
? Select an option	Select an option	Select an option	Select an option	Select an option
? Select an option	Select an option	Select an option	Select an option	Select an option

Select an option

Very poor

Poor

Limited

Average

Good

Very good

Excellent

9. How often do you use each of the languages you have studied or learned for the following activities? (including the native language)

[?](#)

Language	Thinking	Talking to yourself	Expressing emotion*	Dreaming	Arithmetic
? Select an option	Select an option	Select an option	Select an option	Select an option	Select an option
? Select an option	Select an option	Select an option	Select an option	Select an option	Select an option
? Select an option	Select an option	Select an option	Select an option	Select an option	Select an option
? Select an option	Select an option	Select an option	Select an option	Select an option	Select an option

Select an option

Never

Rarely

Sometimes

Regularly

Often

Usually

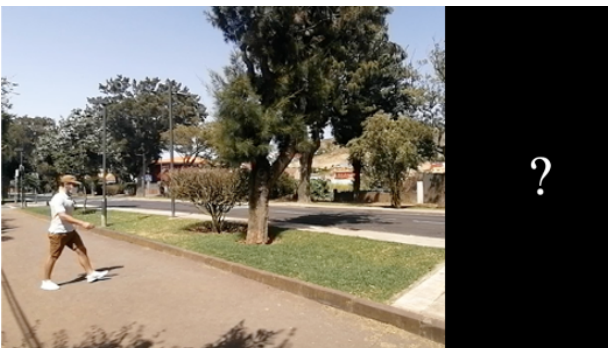
Always

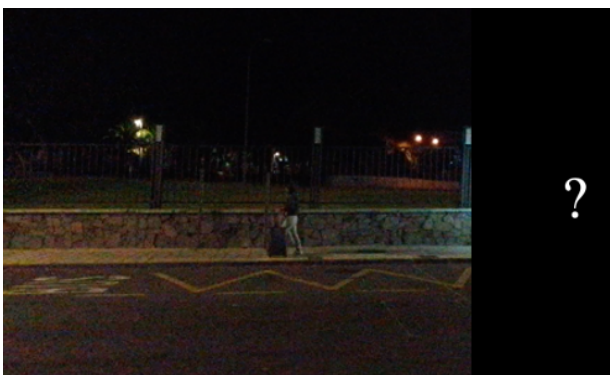
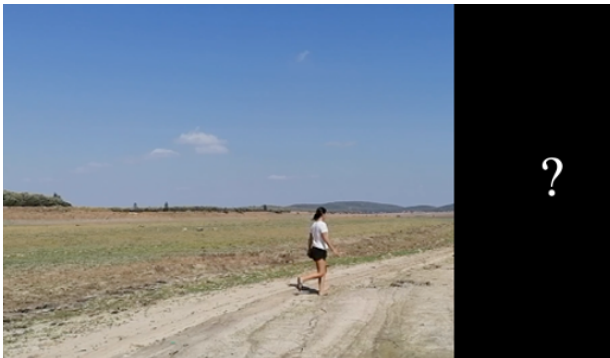
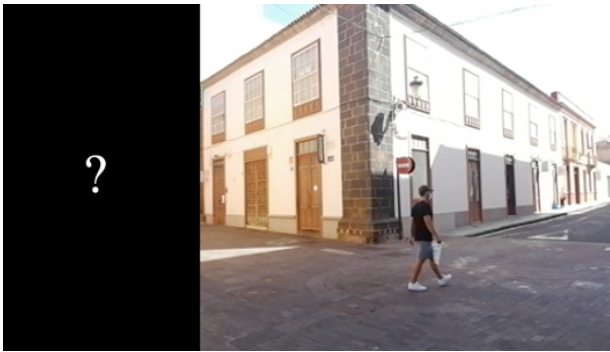
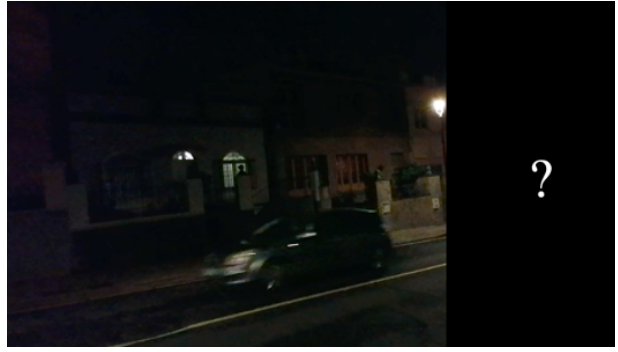
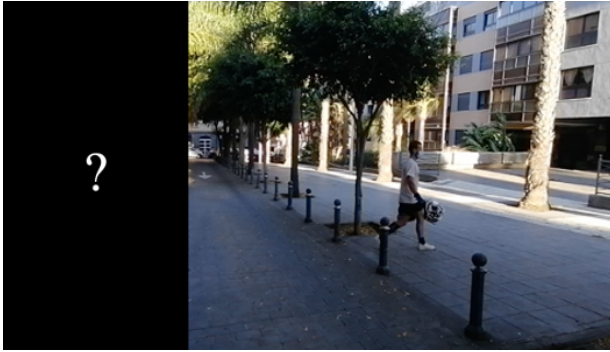
Note*This includes shouting, cursing, showing affection, etc.

**This includes counting, calculating tips, etc.

***This includes telephone numbers, ID numbers, etc.

Appendix C – Stimuli used in the memory task (in a randomized order)





Appendix D – Informed-consent form (English translation)

Consent

1. Background and purpose of the study

This study is part of a Master's Thesis in Language and Linguistics with a specialisation in Cognitive Semiotics at Lund University. It investigates possible links between language and cognition by means of a description elicitation task using video stimuli.

2. Study Procedure

The study consists of two tasks: a description task and a memory task. More detailed information will be provided after the description task and at the end. Also, the participant will be asked to fill in a short language history questionnaire. The experiment will take place via Zoom and should take up to 30 min. The participants will be recorded.

3. Data storage

All data is treated anonymously. Apart from the researcher, only the project supervisor has access to the data. All data will be stored on a computer without access to the internet, in accordance with the guidelines for long-term data storage of the Joint Faculty of Humanities and Theology at Lund University. Extracts of from the recordings may be quoted in the thesis, but there is no way that these can be linked to you personally.

Your participation is voluntary, and you will have the right to withdraw their participation at any time. You will have the opportunity to ask questions at the end of the experiment. On request, you may receive a copy of the thesis upon completion. The successful participation in this study will be compensated with a voucher for 5 euro.

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I acknowledge that **I have read and understood the information on this consent form** and do hereby accept the conditions and implications of my participation. I am aware that my participation is voluntary and that I have the right to withdraw my consent and participation at any time.

(YES (consent) or NO (no consent), to be expressed orally)