

**Investigating motion events:
Endpoints in Speech and Perception of Children and
Adults**

Dissertation

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Presented by:
Anna Marklová

Supervisor:
Prof. Dr. Barbara Mertins

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I dedicate this dissertation to the deepest bottom of the pit because without it, I would never have been able to finish. The only way out is through. While this dissertation is one solid PTC, I was 4TRR the whole time and I never self-eliminated.

Big thanks go to my two most amazing boyfriends, Josef and Leonid, the ultimate STCOs, whom I LL4 infinitely.

Ting ting ting!

Contents

1	Introduction	5
2	Terminology and the main concepts	8
3	Situating the dissertation within the landscape of linguistic relativity	10
3.1	Language and thought debate	11
3.2	From thought and language to thinking and speaking	13
3.3	Motion events	15
4	Methodology	18
4.1	Method	19
4.1.1	Elicitation	19
4.1.2	Eye-tracking	20
4.1.3	Other non-linguistic tasks	23
4.2	Participants	25
4.2.1	Number	25
4.2.2	Language	25
4.2.3	Socio-economic status	25
4.2.4	Age	26
4.3	Material	27
4.4	Literature overview: Methodology	31
5	Publications contributing to the cumulative dissertation	36
5.1	Article 1	38
5.2	Article 2	59
5.3	Article 3	77
6	Conclusion	96
	Bibliography	98
	Appendix	104
	List of Figures	136
	List of Tables	137

Chapter 1

Introduction

The influence of language structure on how we verbalize and perceive motion events has been a growing area of research in recent years. Specifically, researchers have explored the differences in conceptualization between languages and the impact on the phasal and holistic perspectives. The phasal perspective focuses on the process of motion, while the holistic perspective attends to the endpoint of the motion event (Schmiedtová et al., 2011). Previous studies have shown that speakers with a holistic perspective are more likely to verbalize the endpoint in their descriptions of motion events. Additionally, eye-tracking studies have revealed that these endpoint preferences affect visual perception prior to verbalization.

However, a few gaps need to be filled in the research on holistic and phasal perspectives. This dissertation aims to address the following gaps:

1. There is only scattered evidence that holistic and phasal perspectives also occur when language is not activated (Athanasopoulos et al., 2015; Flecken et al., 2014; Flecken, Athanasopoulos, et al., 2015). The findings from an eye-tracking experiment and two non-linguistic tasks, including one utilizing EEG, do not provide a robust argument for the effect of conceptual perspectives on broader cognitive processes that are not directly linked to language. We need to widen the horizon of the non-linguistic tasks to see if we can gather more evidence.
2. The elicitation tasks targeting research on conceptual perspectives have been conducted over the same pool of stimuli: video clips of everyday events prepared by the Heidelberg research group. Additionally, the short film *Quest* has been used for longer narrations. As discussed in 4.3, employing a homogeneous set of stimuli offers advantages regarding research replication. However, it can also present challenges due to the idiosyncrasies inherent in the stimuli. In order to address this issue, we developed a new set of stimuli for this dissertation.
3. Thus far, the verbalization data collected in the research on conceptual perspectives has predominantly consisted of monologues, often comprising single utterances describing individual events. While this approach facilitates straightforward coding and comparability of the data, it does not accurately reflect natural language production. We addressed this issue by eliciting *dialogues* over our stimuli and focusing explicitly on the role of interaction. We developed a coding system that reflects the pragmatic functions of utterance types and can uncover hidden mechanisms of conceptual perspective acquisition in children-parent interaction. It is important to note that the same rules used for ‘simply’ counting endpoints in single-utterance data cannot be directly applied to our data type.
4. The population studied has been almost exclusively adults (except Andersen, *in press*, who studied children of school age). Little is known about the emergence of endpoints during childhood. To bridge this gap, we focused extensively on the acquisition of conceptual perspectives by analyzing children’s speech and parental input. By incorporating a more comprehensive range of participants and investigating the role of parental interaction, we aimed to shed light on the developmental aspects of the conceptual perspectives and their emergence during childhood.

The central part of this dissertation consists of three articles presenting the project’s primary outcomes and findings. They explore a shared theme: the scope of linguistic relativity in the context

of goal-oriented motion events. They are displayed in total length in the text of this dissertation. The first article (5.1) compares parent-children conversations over goal-oriented motion events. This data set has been published, and it is publicly available in a repository¹. It contains verbalization data from Czech, Russian, and Russian-German bilingual preschoolers and their parents. This experiment aimed to expand the research on data elicited in a spontaneous conversation. In this particular study, we focused on parents and asked how often and in which form the endpoints emerge in their speech toward children.

The second article (5.2) presents a study exploring the effect of language-specific tendencies on the visual perception of monolingual and bilingual adults. It analyzes new data collected for the dissertation project. The eye-tracking experiment with adults employed new stimuli and larger groups of speakers in a non-linguistic task. Next to two monolingual groups, we included a group of bilingual speakers in the experiment to measure if some of the perspectives gained prominence in such group.

The third article (5.3) explores tendencies in expression and perception of endpoints in Czech and Russian children in three experiments, with two new data sets collected: verbalization data and eye-tracking data from Czech children. These experiments looked at Czech children with magnifying glasses. We explored several factors which can influence how children express endpoints - we asked about the role of interaction with parents at this young age and then about the prominence of endpoints in the speech of Czech children compared to Russian children. Finally, we conducted an eye-tracking experiment on 75 Czech children, with the same non-linguistic task as in the experiment with adults (5.2). The age of the children in this experiment was gradually increasing. We investigated if there is a gradual increase in visual attention toward endpoints with increasing age.

We would like to inform the reader that the nature of a cumulative dissertation leads toward a certain kind of repetitiveness. The theoretical framework of each article is rooted in the same area of research. Therefore, we cannot avoid explaining the background of each article since they appear in different journals. We aimed not to repeat this theory in the frame text of this dissertation. However, we cannot avoid introducing some basic concepts. However, in the frame text, we are not delving deep into, for example, a detailed description of aspectual systems of languages appearing in this dissertation or the acquisition of language-specific patterns. These topics are elaborated on in detail in relevant articles.

This dissertation project was interrupted by two large-scale external factors. First, the world-wide pandemic of COVID-19 in 2020-2021 made the collection of eye-tracking data impossible. Therefore, we first needed to postpone the data collection in the psycholinguistic laboratories at TU Dortmund and, ultimately, modify the project so the data we required were possible to collect. We prepared an experiment that focused on speech production data instead of eye-tracking, and we arranged data collection among Czech and Russian children. This plan was disintegrated on March 2022 when Russia invaded Ukraine and tore apart any cooperation between Russian and German institutions. Our cooperation with the contacts in Moscow was not possible anymore. That led to modifying the project and adapting the study on speech production in children. Despite those unexpected constraints, a large amount of original data was collected, and new cross-linguistic analyses were made. In total, data from 367 people were analyzed for this dissertation. As described above, each experiment expanded the current stage of the experiments on phasal and holistic perspectives to, until now, unexplored territories.

The dissertation is structured as follows:

Chapter 1: Introduction, which you are currently reading, provides an introductory overview of the dissertation, setting the stage for the subsequent chapters. It introduces the research topic and summarizes the main goals and scope of the dissertation.

Chapter 2: Terminology and the main concepts presents a table with short comprehensive definitions of terms and concepts used in this dissertation. As mentioned above, we have not elaborated on all concepts in the frame text since they appear in the articles. This table serves as a primary reference point for a reader while reading the frame text.

Chapter 3: Situating the dissertation within the landscape of linguistic relativity embeds the dissertation within the broader context of the linguistic relativity research field. It explores the

¹Due to a blind review process, an anonymous version of the dataset was available by the time of the dissertation submission. It can be seen here: <https://dataverse.no/privateurl.xhtml?token=fe4592a8-31ef-4011-b579-fc633f3b0697>.

historical background of the language and thought debate and discusses the field's current state. Additionally, it focuses on the specific topic of motion events, highlighting their significance in linguistic relativity research. It needs to be pointed out that this chapter aims to provide a broader context and particular challenges and issues of this research field. It is not intended to reiterate the hypotheses presented in the articles, as those are addressed within each article.

Chapter 4: Methodology provides a detailed description of the research methodology employed in the studies on holistic and phasal perspectives. It explains the rationale behind the methodology for experiments in this dissertation. The specific methods used in the dissertation - elicitation techniques and eye-tracking - are discussed in detail. The chapter also addresses essential considerations related to participant selection, including the number of participants, their language backgrounds, socio-economic status, and age. A separate part is dedicated to the explanation of the design behind the stimuli. This chapter is closed by a comprehensive review of methodologies used in studies on holistic and phasal perspectives. The review is presented in a table with information about participants, methods, and materials of each study.

Chapter 5: Publications Contributing to the Cumulative Dissertation presents an introductory text of the publications that have contributed to the cumulative nature of the dissertation. It provides a rationale behind each publication. Then, the three articles are included in the entire length. They have their own numbering of figures and tables and their separate bibliography.

Chapter 6: Conclusion concludes the dissertation by summarizing the main findings, discussing their implications, and highlighting perspectives for further research. It reflects on the dissertation and reiterates its significance in the broader context of linguistic relativity.

A bibliography for the main text of the dissertation (i.e., not including the articles) is provided after the *Conclusion*.

Finally, *Appendix* includes all stimuli materials used in the studies. It lists the material for each experiment separately. Two examples of transcripts of parent-child conversations, one in Czech and one in Russian, are displayed in full length, accompanied by an English translation.

The last pages are devoted to the lists of figures and tables. They provide an organized compilation of all the figures and tables in the dissertation and their respective titles and page numbers. These lists facilitate easy navigation and reference for readers.

Chapter 2

Terminology and the main concepts

This chapter offers a compilation of definitions for the key concepts and terms examined in this dissertation, serving as a reference for quick orientation.

Bilingualism	Since there is little consensus on how to define the term bilingual and assess its degree (see Baker and Jones, 1998 for an overview), we consider a bilingual person in Grosjean’s view as a person who generally acquires and uses on a daily basis each of their languages for different purposes and with different people (Grosjean, 1994; Grosjean, 1998; Grosjean et al., 2013).
Conceptualization	The first phase in the process of language production, in which the preverbal message is prepared for expression (Levelt, 1989). Conceptualization occurs after forming the communicative intention (von Stutterheim and Nüse, 2003).
Conceptual preferences/perspectives	Preferences that are based on language-specific patterns and are found during language production. In this dissertation, we use this term to denote phasal and holistic perspectives.
Goal-oriented motion events	Situations where a figure in motion is heading towards a possible endpoint (Flecken et al., 2014).
Holistic perspective	Events are viewed with boundaries and endpoints/results of actions (Carroll et al., 2004).
Lexicalization	“A particular meaning component is found to be in regular association with a particular morpheme” (Talmy, 1985, p.59). In this dissertation, this term is used in connection to Talmy’s research on language-specific lexicalization patterns of verb-framed and satellite-framed languages.
Motion event	It consists of a figure moving with respect to a referent object (ground) (Talmy, 1985). Motion events and locomotion events are used interchangeably throughout this thesis.
Phasal perspective	Events are presented as unbounded, viewed as ongoing actions (von Stutterheim and Nüse, 2003).
Satellite-framed and verb-framed languages	Satellite-framed languages express the manner of motion through the main verb and convey the path of motion through other arguments. In contrast, verb-framed languages reverse this pattern by encoding the path of motion in the main verb and expressing the manner of motion in other elements (Talmy, 1985).

Seeing for speaking	“If a particular language (A) encodes a particular concept grammatically and native speakers of language (A) use this grammaticized concept frequently and systematically, then speakers of this language are very likely to attend to visual features of a given situation that are linked to this concept. By contrast, if language (B) encodes the same concept lexically, or by phrasal means, and native speakers of language (B) do not encode this concept frequently and systematically, then they may not attend to the respective features of a given situation, or at least not to the same extent” (von Stutterheim et al., 2012, p. 835).
Thinking for speaking hypothesis	The cognitive process of preparing content for verbalization is influenced by the specific linguistic categories inherent in the speaker’s language system (Slobin, 1996).

Table 1: Overview of terminology and concepts.

Chapter 3

Situating the dissertation within the landscape of linguistic relativity

This project is embedded within the broader framework of linguistic relativity, which explores the relationship between language and thinking. Before we explain the project's methodology, we provide a context for the experiments conducted in this dissertation. The theoretical framework of each article encompasses the motion events research and the *thinking for speaking* hypothesis. However, their scope is limited. They do not provide a good platform for introducing a broader context of linguistic relativity, which is the foundation for investigating holistic and phasal perspectives.

The theory of linguistic relativity has intrigued researchers for decades. It raises questions about the role of language in shaping our thoughts. Do languages serve as tools for *describing* reality, or do they *influence* our thinking? Moreover, if they do, do different languages vary in degrees of influence due to their structural differences? Contemporary research on the diversity of languages offers ways to explore these questions. Rather than aspiring to answer the question if the linguistic relativity is valid, the research gathers evidence supporting its existence within specific domains where the impact of language on cognition can be observed. Comparably, this dissertation is interested in the scope of relativity effect on one particular area - the motion events. We follow the conventions of creating controlled experimental settings that expose speakers of different languages to situations identified as potential areas for linguistic relativity effects. By exploring the variations in how these situations are processed, we gain insights into the potential impact of language on cognition.

However, how have we gotten to the point where we can study these phenomena in established and controlled ways? This chapter aims to answer this question. In the first section (3.1), we map the development of the leading views on the connection of language and thoughts, showing how complex the history of this idea is. In the second section (3.2), we focus on modern approaches. The approaches in that section differ from the ones presented in the previous one by new methodologies, which allowed researchers to look at the *processes* of thinking and speaking.

3.1 Language and thought debate

This section provides an overview of the development of language and thought debate (see, i.e., Soroli et al., 2019). The discourse on the relationship between thinking and language played a crucial role in developing the concept of linguistic relativity, and it has been a topic of discussion for centuries. In fact, we can track its roots back to Plato. In his theory of *Forms*, Plato describes that for the purpose of understanding each other, there must be some pre-existing abstract concepts to which speakers refer to while speaking (in dialog *The Sophist*, in Hamilton, 1996). Gill (1997) identifies Plato as the beginning of the Western tradition, which considers language as being based on reality, without considering the possibility that different language structures may lead to various ‘conceptual realities’ (p. 132).

The question of the relationship between thoughts and language has gained closer attention since the 17th century (Descartes, 1911, Pascal, 1670). In the 18th century, theories suggesting a dependency of thinking on language began to emerge (Humboldt, 1792, Hegel, 1894). Alongside the opinion that language influences or even shapes our thoughts and conceptualization, approaches claiming that there is no influence occurred as well. Locke (1690), as a representative of the rationalist perspective, argued that thoughts precede language and that language cannot shape our thoughts. The physical reality comes first, from which abstract ideas are formed and labeled by words in speech. Berkeley (1734) contributed to the discussion by identifying that language serves more functions than solely representing reality. Kant (2007/1781) theorized that our experiences are created through the interaction of sensory input and mental processes. In other words, thoughts, as well as the outer world, create our experience.

At the beginning of the 20th century, Wittgenstein (1974) expressed his stance, arguing that the boundaries of language are connected to the limits of reality. Vygotsky (1934) related the topic to language acquisition, stating that the interaction between thought and language begins when children learn to use social tools, such as speech production. Finally, Whorf (1940) found the basis for what is now called the Sapir-Whorf hypothesis. It expresses the idea that language influences how we think, perceive, and conceptualize the world. Sapir elaborated on this idea further, highlighting the significance of formal structures that intricately connect language categories, forming a cohesive system. These formal structures exhibit variation and carry meaning, influencing their components’ overall meaning and value. As speakers interpret events, they employ the comprehensive conceptual framework provided by their language, ultimately leading to distinct and systematically coherent interpretations of reality (Whorf, 1956). Benjamin L. Whorf further explained this theory by demonstrating the semantic interrelations of extensive structural meanings. Examining the entirety of grammar structure rather than isolated linguistic forms is essential to fully comprehend these interrelations, as they collectively contribute to a holistic understanding. Whorf’s methodological innovation, which involved seeking behavioral evidence of language effects through a specific mechanism, is now widely acknowledged as crucial in all investigations of relativity (Lucy, 2016).

From this point on, not just various opinions on the relationship between language and thoughts but also questions about the methods of gathering evidence for this hypothesis have started to emerge. Scholars expressed various opinions about how the evidence should be collected.

Brown and Lenneberg (1954) put forth the hypothesis that language categories have the potential to facilitate the cognitive encoding of certain aspects of reality. Consequently, variations in these categories across different languages are expected to result in corresponding variations in cognitive behavior. They further emphasized the need for this cognitive assessment to incorporate clear ‘non-linguistic’ measures, encompassing perception, classification, inference, and memory. By ‘non-linguistic,’ they specifically intended that the assessment process should not rely on verbal communication, which would lead to confounding speech behavior and cognitive processes. They intended to address the claims made by some scholars who asserted the existence of cognitive differences solely based on speech behavior. Notably, ‘non-linguistic’ did not imply that language played no role in cognition. On the contrary, the underlying concept of codability suggested that even in the absence of speaking, lexical labels themselves were involved in cognitive processes. The requirement for a non-linguistic or nonverbal measure is now universally embraced. However, it is occasionally misconstrued to suggest that cognition should not involve language, which is not the intended meaning (Lucy, 2016).

On the other side of the theories about language and thoughts, the concept of a universal cognitive system was further elaborated in the 20th century by Chomsky (1975) and Pinker (1995).

In the 1990s, Gumperz and Levinson described a shift in linguistics research (Gumperz and Levinson, 1991). While Boas, Sapir, and Whorf's initial idea resonated among anthropologists, linguists, and psychologists, there was an abrupt shift in the 1960s, emphasizing the commonality of cognition and claiming some semantic universals. The conference *Rethinking linguistic relativity* from 1991 revived the topic of linguistic relativity and introduced it into the context of the current state of affairs. It identified that while some communicative principles, for example, Grice's maxims (Grice, 1989), are arguably widespread, some seem to be culture-specific. The symposium discussed the question of language influencing thoughts, and it came to a conclusion opposing an extreme linguistic determinism, which claims that language constrains thinking and even perception in a particular way. It did not rule out the option of language influence on thinking, and it emphasized the vital role of methods of investigation. As Lucy argued, the original Whorf's idea targets grammatical paradigms, not specific semantic domains. Experiments should be carried out comparatively on at least two contrastive languages. Additionally, the discourse shifted from purely language-focused to culture-focused, with questions exceeding linguistic relativity and asking for a broader concept of cultural relativity (and universals). Although it did not bring a precise model of such a concept, it confirmed that language and its influence could not be studied and discussed without considering the broader cultural context. Ochs, for example, argued that culture is learned through embodiment in practice - primarily linguistic practice (reported by Gumperz and Levinson, 1991).

At this point, we are entering the area of modern research on linguistic relativity, which is connected to the topic of this dissertation more closely. Namely, Slobin's *thinking for speaking* hypothesis has been pronounced, and the basic conventions for the research methodology have been established. Research on motion events expanded with Talmy's research on lexicalization patterns and the differences in motion event descriptions across languages. Therefore, we will dedicate the next chapter to some key methodologies and ideas of the last decades of the research. Notice the shift from the philosophically based questions in the just concluded section toward the processes of thinking and speaking and their interconnections. The research has become centrally based on gathering empirical evidence, both linguistic and non-linguistic.

3.2 From thought and language to thinking and speaking

As pointed out, this section aims to establish the background on which the research presented in the articles of this dissertation has emerged. Each article describes the specific area of the research in greater detail, which we do not repeat in this section. Instead, some basic approaches and ideas for methodologies of research are discussed.

We can see the shift from thought and language to the underlying processes in the work of Levinson. Levinson (1997) asks if we think the way we speak. More precisely, if the representations underlying linguistic meaning are the exact representations that underlie non-linguistic thinking. For that, the distinction between semantics and conceptual representation is needed. He differentiates between two branches of scholars: those who do not distinguish between semantics and conceptual representation (Langacker, 1987, Jackendoff, 1983, Fodor, 1975, Fodor et al., 1975), and those who make this distinction (Sperber and Wilson, 1986, Atlas, 1989, Barwise and Perry, 1983, Miller, 1982, Pinker, 1995). Levinson argues that semantic representation can be, at most, a subset of conceptual representation. Additionally, Levinson (1997) pinpoints an essential feature of formulating thoughts into words: "Speech forces a linearization of thought and the taking of perspective" (p.20). Another phenomenon is connected with that feature: language-specific obligatory categories. Levinson points out that languages enforce obligatory grammatical and semantic distinctions. He then elaborates that it can either mean that the thoughts of speakers of different languages are systematically different (which he considers improbable) or that we have to assume that there is a reorganization between having an initial thought and pronouncing it in the language (Levinson, 1997). Levinson states that "our innermost conceptualization of experience is molded by the language-specific concepts" (pp. 28-29). To investigate if there are non-linguistic concepts corresponding in conceptual representations, we need to employ tasks that require no verbal input and no verbal response, for example, sorting tasks (Levinson, 1997).

In recent decades, psycholinguistics and cognitive sciences have dealt with the challenge of connecting underlying mental representations with language production processes (Soroli et al., 2019). Lucy (2016) describes that in the modern period, there is a rapid increase in empirical studies on a wide range of topics from the linguistic relativity area. The evidence of language effects has been found for the cognition of color, musical pitch, number, spatial orientation, motion, time, cause and animacy, object type and gender, and false belief (Lucy, 2016)¹.

Lucy (2016) differentiates between two directions in linguistic topology research, which crystallized in the late 1970s and impacted linguistic relativity research: structure-centered and domain-centered. A linguistic description and typological comparison focusing on the structure centers around selecting one or more lexico-grammatical structures pertinent to reference, such as number, gender, or aspect marking. The objective is to investigate and examine the variations of these structures across different languages. In order to examine linguistic relativity, it is necessary to undertake two additional steps. Firstly, there needs to be an exploration of how reality might be perceived differently from the perspective of each relevant linguistic system. Secondly, an assessment should be conducted to identify any cognitive differences associated with these linguistic perspectives (Lucy, 2016)².

On the other hand, a domain-centered approach to linguistic description and typological comparison involves selecting a specific domain of experiences, such as color, time, or space. The objective is to investigate how different languages divide and categorize this domain, thereby establishing a typology of denotational regularities. To assess linguistic relativity, the focus shifts towards examining any cognitive differences associated with these distinct partitions of the selected domain. Levinson's research on frames of reference in the domain of space is an example of a fully developed domain-centered approach (Levinson, 2003). As this approach centers on the denotation of language within specific contexts, the patterns observed cannot always be deduced solely from grammatical descrip-

¹For an overview of the current state, see, e.g., Casasanto (2012), Wolff and Holmes (2011), Everett (2013), Gentner and Goldin-Meadow (2003), Malt and Wolff (2010).

²As an example of this approach, see John Lucy's research on number marking in Yucatec Maya (Lucy, 1992a, Lucy, 1992b, Lucy, 2014)

tions. Instead, they must be evaluated for each language within appropriate diagnostic usage contexts. By examining usage differences, it becomes possible to predict cognitive distinctions across languages in various aspects such as memory, inference, and other cognitive processes (Lucy, 2016). These two approaches have together established complex and coherent models for relativity research.

Our research combines the approaches mentioned above: It explores the domain of goal-oriented motion events and their language-specific differences. However, this research exceeds the domain approach by establishing the structural element of aspectual systems as the root of differences. It explains how the obligatory category of aspects influences the conceptualization of reality.

This dissertation follows a root of research on linguistic relativity based on Dan Slobin's research. In his study *From "thought and language" to "thinking for speaking"* (Slobin, 1996), Slobin followed theories suggesting that people are influenced by their native language and its obligatory grammatical categories during the thinking about the world. Slobin elaborated on this idea. "Thinking for speaking involves picking those characteristics of objects and events that (a) fit some conceptualization of the event, and (b) are readily encodable in the language. I propose that, in acquiring a native language, the child learns particular ways of thinking for speaking" (Slobin, 1996, p. 76). We can see these particular ways, e.g., in a different use of tenses that is consistent with grammar tools of a particular language or in an expression of spatial relationships. Slobin compared the description of motion events in English and Spanish, concluding that there were systematic differences. "English tends to assert trajectories, leaving resultant locative states to be inferred; Spanish tends to assert locations and directions, leaving trajectories to be inferred" (Slobin, 1996, p. 84).

In the following section, we will elaborate further on Slobin's thinking for speaking hypothesis and the area of relativity research that forms the focal point of this dissertation: the domain of motion events. We can better understand how linguistic relativity manifests in this domain by examining how different languages structure and categorize motion.

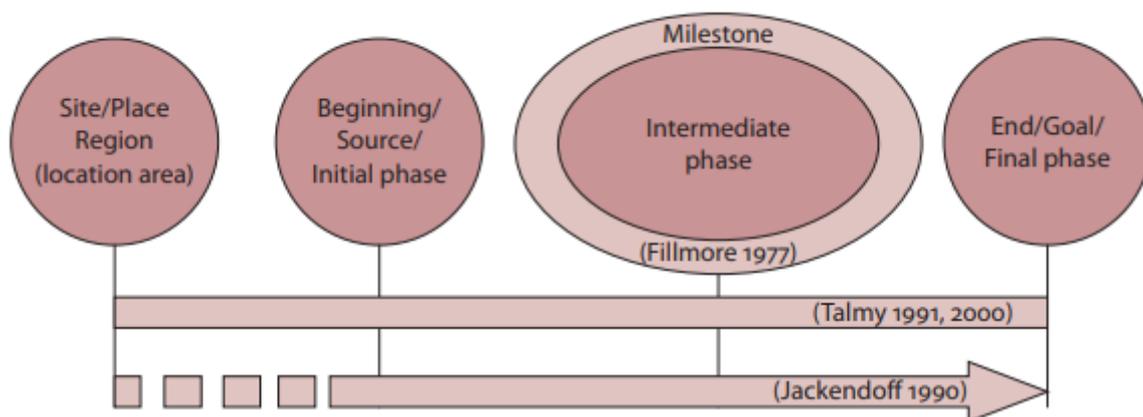


Figure 1: Motion events Terminology (Soroli et al., 2019)

3.3 Motion events

The focus of this dissertation, i.e., aspectual systems and their influence on the expression of endpoints, has its own history of research, which is in detail presented in the articles (5.2; 5.3; 5.1). Therefore, we will not repeat it in this place in detail. Following a brief introduction to the field of motion events research, this section will instead focus on addressing the challenges of this research within a broader context that surpasses the limitations of the articles mentioned above. Specifically, our attention will be directed toward discrepancies in terminology and their consequences.

Linguistic relativity research has focused extensively on motion events. Motion events can be seen as a window to conceptualization “because languages universally encode them in terms of a small but specific set of components, which can plausibly be viewed as corresponding to the non-linguistic components that guide our perception and understanding of such events” (Landau and Zukowski, 2003, p. 108). According to Talmy (1985), “a basic motion event consists of one object (the ‘Figure’) moving or located with respect to another object (the referent-object or ‘Ground’)” (p. 61). This characteristic considers static events, which involve location, and dynamic events, which involve motion. In the dissertation, we solely focus on examining the dynamic events, resp., their representations.

Soroli et al. (2019) pointed out the inconsistencies in the terminology used among researchers focusing on motion events. There is, for example, a wide range of broadness which the term *path* can contain³. The visualization is provided in Figure 1. According to Talmy, *path* can be seen as a complete trajectory. Following Jackendoff, it is a vectorial trajectory (Jackendoff, 1990). For Fillmore, it is an intermediate part of a trajectory (Fillmore, 1977). The various methods of description are linked to the purpose of the particular research. In our project, we place emphasis on analyzing the components of motion events and give them equal consideration. Nonetheless, the focal point lies on the endpoints, as their expressions are impacted by the conceptual perspectives we investigate.

Research on holistic and phasal conceptual perspectives developed its own specific terminology (Schmiedtová, 2011a; Schmiedtová et al., 2011; von Stutterheim et al., 2012). Therefore, we must be careful while comparing the findings from that area of research with other psycholinguistic studies on motion. Schmiedtová (2013) uses the following terminology for parts of motion: “endpoint (e.g., prepositional phrases such into a house, towards a house, in the direction of a house), manner (e.g., to run fast, to play with a ball), location (e.g., in the garden, on the road), path (e.g., down the road, along a path, through town) source (from a building, taking off from the surface)” (p. 97). In von Stutterheim et al. (2012), locomotion is segmented into inchoative, intermediate and terminative phase. The phase which speakers emphasize determines if they follow a holistic or phasal perspective:

³Same is valid for terminology around *manner* of motion, which is further away from the focus of this dissertation.

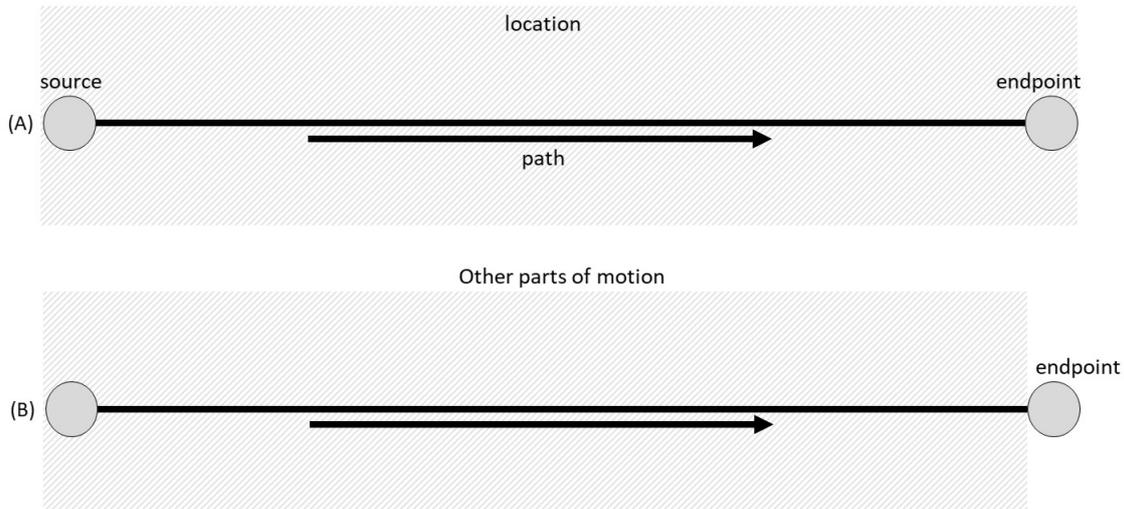


Figure 2: Research on holistic and phasal perspectives: the motion events terminology.

“When viewing a series of everyday events (video clips which include a set of motion events) and telling what is happening, speakers of English conceptualize the event as ‘in progression’ and segment the situation into phases (inchoative, intermediate, terminative phase): a car is driving along a country road (intermediate phase); a truck is approaching a village (terminative phase), thereby focusing on the phase that is prominent in the stimulus. Speakers of German take a holistic view and typically represent the event — whatever phase of the event has been depicted — with an endpoint (ein Auto fährt auf einer Straße zu einem Dorf, a car drives on a road to a village)” (p. 836). The endpoint is sometimes referred to as a *path-endpoint* region, following Talmy’s terminology.

Since studies with endpoints in the center of attention use the word *endpoint* when studies concerning differences in lexicalization patterns of verb-framed and satellite-framed languages use the word *path* for the same referent, experiments on manner and path asymmetry can bring valuable findings about endpoint processing. For example, in the study Papafragou et al. (2008), the area of an endpoint (or a final stage of the motion) is coded and analyzed in an eye-tracking experiment, yet it is always referred to as *path*.

Another root of research on motion events that differs terminologically focuses on the phenomenon *goal-over-source asymmetry*, which has been observed in numerous languages and has been deemed universal by some researchers (e.g., Dirven and Verspoor, 2004). In this context, the term *goal* corresponds to the *endpoint* in research exploring holistic and phasal perspectives. Goal-over-source asymmetry phenomenon is described as a tendency to pay more attention to an action’s goal rather than its source (e.g., Landau and Zukowski, 2003; Lakusta and Landau, 2005; Johanson et al., 2009; Papafragou, 2010). Preference for a goal over other parts of motion events (not just over a source) seems to be connected to events with an animate subject, as it has been observed in experiments with infants (Gergely et al., 1995; Woodward, 1998; Meltzoff, 1995; Papafragou, 2010). The importance of goal-over-source asymmetry must be considered while analyzing motion events.

As mentioned, some studies which use stimuli with goal-oriented motion events have not concentrated on the difference between phasal and holistic perspectives. Instead, they have used the endpoint as a part of the path, investigating the differences between verb- and satellite-framed languages. That poses an interesting discrepancy in the research. We have two existing phenomena: the cross-linguistic differences sourced in lexicalization patterns and the differences based on holistic and phasal conceptual preferences. Consider, for example, English. It is a satellite-framed phasal language. Therefore, it focuses on the manner of motion, and it does not focus on the endpoint. In an experiment with stimuli containing a figure moving towards an endpoint (such as in the experiment in Bunker et al., 2021), the forces of both phenomena will lead the attention towards the process and

the manner of motion. However, how to recognize in the results which influence is the cause of the attention distribution? Next, consider German. German is a satellite-framed language, but it follows a holistic perspective. The lexicalization pattern leads its attention toward the manner of motion over the path, but the holistic conceptual perspective leads it toward an endpoint. What does it mean for the attention paid to the stimulus described above?

Flecken, Carroll, et al. (2015) describes that the research on conceptual perspectives goes beyond the initial differences between path and manner by more fine-grained differentiation between the parts of the path concept. It looks at the differences in selecting particular spatial categories (such as location, source, or endpoint) in the motion event description.

To summarize, the field of motion events is of great interest to researchers who study language-specific patterns, including lexicalization patterns and variations in aspectual systems. Additionally, research on tendencies suspected to be universal, such as the goal-over-source asymmetry, attracts attention. As a result, the terminology used to describe the components of motion events becomes somewhat blurred. This dissertation primarily focuses on the aspectual systems research and the associated terminology. However, we also recognize the importance of incorporating findings from other specific research areas, as they are relevant to our investigation.

Chapter 4

Methodology

In this chapter, we will describe the methodology used in the experiments of this dissertation project and provide a broader context of the methods commonly used in the research on motion events. Firstly, some points on the methodology while investigating linguistic relativity and language-specific patterns will be discussed since exploring linguistic relativity poses an important methodological question: Which methods and experimental designs can effectively investigate the phenomenon? Furthermore, what criteria must be met to ensure that the impact of language on non-linguistic behavior is accurately measured?

While observations in language data uncover essential elements of language-specific concepts, we need to extend the study of linguistic material outside of language production. Non-linguistic tasks, such as sorting tasks, matching, and categorization tasks, have been used in linguistic relativity research (Lucy, 1992a, Levinson et al., 2002). The combination of behavioral linguistic data and non-linguistic data is a proper approach to ensuring that language-specific differences have a systematic effect on broader cognition. Eye-tracking measurements are an excellent tool for cross-linguistic comparisons. It should be noted that the criticism of experiments aiming at linguistic relativity argues that they may not accurately capture the everyday contexts and functions of language use and may focus too much on individual thought rather than social aspects (Leavitt, 2011, Sidnell and Enfield, 2012). In the dissertation project, we addressed these concerns by conducting experiments that both involve and do not involve language. Especially in the experiments with children, we attempted to simulate real-life situations.

Experimental methods in psycholinguistic research can be classified into three categories: offline, online, and true online methods (Mertins, 2016). Offline methods focus on conscious decision-making and cannot measure online mental processes, often involving a time delay in task completion. These methods include e.g., internet-based questionnaires, pen-and-paper questionnaires, or elicitation tasks. Online methods provide limited access to mental processes, which are automatized and unconscious. Eye-tracking or reaction time experiments are examples of those methods. True online methods can study highly automatized and unconscious mental and neuronal processes (we discuss methods such as EEG, PET, fMRI, etc.). All three methods have been used in research targeting phasal and holistic perspectives.

For the dissertation project, elicitation and eye-tracking were chosen. Elicitation provided data for the necessary analysis of language production. Eye-tracking enabled us to uncover the unconscious processes and explore the questions of linguistic relativity by eliminating the language task from the experiment. Additionally, it is a friendly online method for various populations, including very young children (although it also poses some challenges). We will discuss those two methods in detail in the following sections. Since linguistic relativity is in question, the last section will mention studies on conceptual perspectives that employ non-linguistic tasks.

The examples of studies using the mentioned methods and participant groups are taken from the research on phasal and holistic perspective research and lexicalization patterns. However, we focused exclusively on the former in the overview table (4.4). We did not include the lexicalization patterns studies.

4.1 Method

4.1.1 Elicitation

Elicitation is one of the fundamental research methods of linguistics. It is an umbrella term for many tasks, including eliciting particular linguistic structures, which rarely occur in spontaneous speech. It serves as a means of testing a specific hypothesis that has been formed beforehand. The stimuli used in elicitation tasks are of various kinds. Pictures, picture books, video or audio recordings, or written instructions are commonly used. Pictures are suitable for elicitation of children’s language (Mertins, 2016).

Language production methods can uncover systematical differences in the description of motion events. The research on motion events has included elicitation of narratives over picture books, namely *Frog, where are you?* (e.g., Berman and Slobin, 1994, Slobin, 1996, Slobin, 2003, Slobin, 2004, Slobin and Hoiting, 1994, Özçaliskan and Slobin, 2000), or other static picture material (e.g., Hickmann, 2003). The picture book *Frog, where are you?* (Mayer, 1987) was at the beginning of the *thinking for speaking* research, and there is an extensive corpus of elicited narratives by children about this picture book in the CHILDES database (MacWhinney, 2000). Video clips have been widely used as stimulus material in the research on goal-oriented motion events (see 4.4). Longitudinal studies focusing on speech production have also made significant contributions (Choi, 2011, Choi and Bowerman, 1991, Choi, 2017, Hickmann et al., 2009).

Elicitation has been commonly used in the research on phasal and holistic perspectives (e.g., Sahonenko and Schmiedtová, 2008, Schmiedtová, 2011b, von Stutterheim et al., 2012, Schmiedtová, 2011c, Schmiedtová, 2013, Mertins, 2018). We will describe a few experiments in this area of research in greater detail.

von Stutterheim et al. (2002) employed elicitation in a study that gave the first insight into the language-specific patterns in expressing endpoints while describing events. 20 German, 20 Spanish, and 20 English speakers took part in the elicitation study. The material consisted of 8 computer animations, four depicting a change of place and four depicting an ongoing activity. The endpoints varied in their inferability: two items with a clear endpoint, two with an inferable endpoint, and two with no endpoint. In these six items, the endpoints were not reached. Additionally, there were two items with an endpoint that was reached during the presentation. The participants were asked to describe what was happening in the animations. It was discovered that German speakers mentioned the endpoint 3.85 times on average, English speakers 1.70 times, and Spanish speakers 2.05 times. These differences were statistically significant. This research gave a base for the elicitation research on language-specific patterns in endpoint expression.

Sahonenko and Schmiedtová (2008) used video clips depicting goal-oriented motion events to elicit adult speech in the experiment with native speakers of Czech, Russian, German, and advanced learners of German (n=30 per group). Forty short video clips were used as stimuli, including eight critical items and 24 distractors. The participants were asked to answer the question *What is happening?* as soon as they orient themselves in the scene. The elicited speech was audio recorded, transcribed, and coded. The study examined how and to what extent core grammatical categories determine the selection and structuring of information in a dynamic context. Mertins (2016) mentions the challenges and limits of such experimental design, such as to control entirely for equality of protagonists performing motion events (person, animal, object, vehicle, etc.), the directionality of the movement (left to right or right to left), some intercultural aspects, and length of the video clips. The question *What is happening?* is not exclusively targeting the motion event. Therefore, participants may answer whether it is raining, if there is some secondary event, etc.

As seen in 4.4, all the elicitation studies on phasal and holistic perspectives had mono-logic character. The task prompted either a narration of events in a short film (e.g., von Stutterheim and Nüse, 2003) or a single utterance answering of the question *What is happening?* in short video clips of everyday events. In the elicitation experiments presented in this dissertation project, we wanted to expand the research method to analyze endpoints and how they happen in conversation - either spontaneous, interactive setting or more controlled interrogatory interaction. The dialogue character of the speech production data poses a challenge for coding and assessment, as it contains more areas of inter-individual variation.

4.1.2 Eye-tracking

Eye-tracking has been broadly used in research exploring the influence of language-specific patterns on visual attention. The experiments have usually combined the eye-movement measurements with speech elicitation and/or memory tasks. However, studies not including language tasks have also been conducted.

The eye tracker utilizes high-definition cameras and near-infrared lights to record the pupil's position and the corneal reflection. By projecting a point light onto the participant's eyeball using near-infrared light, the corneal reflection remains constant while the pupil moves as the eye moves. Measuring the distance between these two points enables calculating the eyeball's position within the head (Tagliani and Redolfi, 2023).

For observing a visual scene, we distinguish between eye movements called saccades and eye stops called fixations. Saccades bring a new region into view and cover a considerable distance. They are approximately 40-50 ms long. The fixations, i.e., stops on a particular scene spot, are around 330 ms long on average, but their length varies greatly (Conklin and Pellicer-Sánchez, 2016).

Spatial orientation, in our case, the observation of a stimulus depicting a motion event, can be divided into three steps: “the engagement of visual attention at a particular stimulus/locus, the disengagement of visual attention from a stimulus/locus, and the shifting of visual attention from one stimulus/locus to another” (Colombo, 2001, p. 343). Recording of that process can uncover which parts of the scene are more salient to the observer than others. Therefore, cross-linguistically analyzing the fixations in- and entry time to the endpoint area can uncover if speakers of different languages pay different amounts of attention to that area, in the cumulative fixation time and the onset of attention on it.

Various measurements can be considered while analyzing eye-tracking data (for a comprehensive analysis, see Holmqvist and Andersson, 2017). For visual stimuli-based experiments¹ where areas of interest (AOIs) are defined, as in ours, some basic AOI events are to be measured:

1. The AOI hit: A raw sample or a fixation with coordinate value inside the AOI. It can be constrained by a minimal time inside the AOI.
2. The dwell: one visit of AOI, from entry to exit. It contains information about starting time and duration values, as well as about the number of fixations.
3. The transition: a movement from one AOI to another.

In our experiments, we based our measurements on the basic AOI event: dwell. We chose the primary measures of cumulative fixation duration and the first entry time into AOI. As fixation duration tracks the time spent in the AoI, it brings valuable information about the overall attention to the endpoint of different degrees of consciousness. On the other hand, entry time reflects an automatized process, and we expect it to be less deliberative. Therefore, it can uncover automatized processes behind motion events conceptualization.

Eye-tracking in linguistic research has a long tradition. The first use of the eye-tracking method as a measure for assessing language-processing abilities was by Cooper (1974). Tanenhaus et al. (1995) followed up on this approach and developed what is now known as the visual world paradigm: fixations of participants on objects are closely time-locked to information presented in an utterance (for a comprehensive overview, see Tagliani and Redolfi, 2023). Eye movements can provide information about the time course of adult language comprehension, production, or dynamic conversation (Trueswell, 2008). It is assumed that eye position indicates the attentional state of a viewer, and the attention is led by the world's properties and the goals of the viewer (Trueswell, 2008, Findlay, 2004; Liversedge and Findlay, 2000).

Eye tracking is useful for studying children's passive language knowledge, as it does not require a verbal response (Arunachalam, 2013). Especially head-free eye tracking systems (e.g., Tobii 1750) have been commonly used because they, unlike head-mounted systems, do not require inconvenient direct contact with the child's head (Trueswell, 2008). During recordings, head-free eye trackers allow participants to freely move their heads in three-dimensional space. This remote modality enables the

¹I.e., not for reading experiments.

eye tracker to track the head’s position throughout the experimental session, including information about the distance between the head and the screen (Tagliani and Redolfi, 2023). However, it is essential to acknowledge the challenges associated with eye-tracking research involving preschool-aged children. High variability in attention and attention loss are common issues, leading to a more significant loss of participants compared to studies conducted with adults.

Several studies have been focused on the development of eye movements in childhood (e.g., Mash and Arterberry, 2011; Helo et al., 2014; Helo et al., 2016). They uncovered a few patterns; the fundamental eye movements, such as fixations, saccades, and smooth pursuit of movement, emerge shortly after birth and are established quickly during the first six months. However, some quantitative qualities occur later in the development (Colombo, 2001, Trueswell, 2008). Helo et al. (2014) investigated two kinds of mode - focal and ambient - in different age groups. Ambient mode is characterized by short fixations followed by large amplitude saccades and usually takes place in the first 2 seconds of the scene viewing. The focal mode contains long fixations surrounded by saccades of relatively short amplitudes. The ambient mode is used for the orientation in a scene, and the focal mode is used to identify objects (Holmqvist and Andersson, 2017). Helo et al. (2014) identified that the ambient mode was rare in young children and increased with age. Therefore, comparing a group of children’s participants with a group of adult participants is not recommended since their eye movements may vary due to the ‘natural’ development of visual attention. We followed these findings by conducting separate experiments for adults and children.

Eye-tracking proves to be a valuable method for investigating the impact of language-specific patterns on non-linguistic tasks. It is reasonably friendly to users since it does not require long preparation, restriction of movements, or placement of a part of the system on the head. However, it is still an online method allowing researchers to uncover unconscious processes.

Several studies used eye-tracking for a cross-linguistic comparison of motion event conceptualization (e.g., Bunger et al., 2021, Bunger et al., 2011, Bunger et al., 2016; Flecken et al., 2014; Sakarias and Flecken, 2019, Papafragou et al., 2008; Trueswell and Papafragou, 2010). We will now provide a few examples of eye-tracking in the research of motion events and holistic and phasal perspectives in particular.

In combination with elicitation and memory tasks, eye-tracking was used in von Stutterheim et al. (2012). The purpose of the experiment was to study the effect of language on cognition, following consequently *seeing for speaking* hypothesis (Carroll et al., 2004, Schmiedtová et al., 2011). It analyzed the encoding of endpoints in goal-oriented motion events in Czech, Dutch, English, German, Russian, Spanish, and Modern Standard Arabic speakers (n=20 per group). Sixty video clips were employed, including ten critical items, ten control items, and 40 fillers, with the critical items containing goal-oriented motion events. The participants saw each clip on the computer screen for 6 seconds while their eye movements were recorded. Their task was to describe what event was happening in the picture. They were discouraged from describing anything other than the event. The measurements considered were the fixation count into the endpoint area, the total fixation duration, and the number of first and second fixation periods. It was discovered that the attention to endpoints follows language-specific patterns. Therefore, it is higher in languages with a holistic perspective than in languages with a phasal perspective.

Eye-tracking studies with no linguistic task have been rare. They have brought mixed evidence for the scope of linguistic relativity. For example, Ünal et al. (2022) measured eye movements in Turkish speakers (n=36) while they watched video clips of motion events (n=25) in two settings: when they were preparing for verbalization, and when no linguistic task followed the stimuli presentation. This research focused on lexicalization patterns, not phasal and holistic perspectives. As a verb-framed language, Turkish emphasizes the path of motion over the manner of motion. It was discovered that the speakers allocate more attention to the path over manner when there is a verbalization task following the video clips presentation than when there is none. Therefore, it supports the idea that linguistic planning guides visual attention. Moreover, the Turkish speakers allocated more attention to the path over the manner in cases when they encoded the path in their speech than when they did not (Ünal et al., 2022). Overall, in the research with adults, the effect of language-specific patterns tends to disappear when verbalization does not follow the viewing task (in research on satellite-framed and verb-framed languages, see Bunger et al., 2016; Bunger et al., 2011; Flecken et al., 2014; Sakarias and Flecken, 2019; Trueswell and Papafragou, 2010).

Eye-tracking with a non-linguistic task was also employed in the study with Greek and English

3- and 4-years old children (N=79) (Bunger et al., 2021). The children watched short animated clips (n=12) with a motion event. There were two conditions: linguistic, where the eye movements were measured in the phase of speech planning, and non-linguistic, where the children were asked to observe the stimuli carefully because some questions about them would follow. The study aimed to observe cross-linguistic differences in focusing attention on the path or manner of motion since Greek is a verb-framed language and English is a satellite-framed language. The analysis uncovered that when the children mentioned manner of motion, they also directed the eye-gaze on it (in some 1 s long time windows of 9 s long eye-gaze). They concluded that children start to direct their eye-gaze by three years of age according to what they plan to verbalize. No significant cross-linguistic difference was found when verbalization did not follow the stimuli presentation (Bunger et al., 2021).

Lastly, within phasal and holistic perspective research, a non-linguistic study utilizes an eye-tracking methodology. Flecken et al. (2014) explored the perception of motion events by German and MS Arabic speakers in two different tasks, verbal and non-verbal. The stimuli were video clips with goal-oriented motion events: 10 control items with an entity reaching an endpoint, ten critical items with an entity not reaching an endpoint and 40 fillers. Each stimulus was presented for six seconds. Furthermore, the language production and eye-tracking data from von Stutterheim et al. (2012) were re-analyzed for the verbal task setting. New data from 20 German and 20 MS Arabic speakers were collected for the non-verbal task. The non-verbal tasks contained the same ten critical stimuli as the verbal task, a selection of five control stimuli, and 27 fillers. The participants were shown six sets of seven video clips, including the critical and control items, and simultaneously, the sound of ocean waves was played in the background. In some of the scenes, the participants heard a specific additional sound. They were instructed to remember how the scene looked like when the additional sound occurred. After the set of seven video clips ended, seven screenshots appeared on the screen, and participants were asked to select the screenshots of the clips in which they had heard the additional sound. The participant's eye movements were recorded during the whole experiment. The difference between the language groups was found in the language production data. However, the eye-tracking data did not display any significant effect of language on the cumulative fixation duration on the endpoints in verbal and non-verbal tasks. The only difference which reached a significant level was the interaction between language and condition (critical and control) for the fixation count (Flecken et al., 2014).

In summary, eye-tracking offers a well-suited tool for investigating linguistic relativity. It enables us to examine the relationship between language-specific patterns and cognition by measuring eye movements and fixation patterns. The main advantages are:

1. objective and precise measurement of individuals' visual attention
2. non-invasive data collection, which makes it suitable for studying linguistic relativity in a natural setting
3. real-time analysis of eye movements, providing immediate feedback on unconscious cognitive processes

Moreover, eye-tracking is a well-established method in researching motion events and *seeing for speaking* hypotheses. While it has been employed in non-linguistic tasks concerning differences in verb-framed and satellite-framed languages, it has been rarely used in non-linguistic tasks targeting differences between languages with phasal and holistic perspectives. Moreover, it has not been used in non-linguistic tasks with preschoolers. This dissertation project addresses this gap through two eye-tracking experiments targeting a less-represented population of children and, in addition, bilingual speakers.

4.1.3 Other non-linguistic tasks

Given the rarity of utilizing non-linguistic tasks in research focused on phasal and holistic perspectives, we will describe the limited number of studies incorporating such tasks².

Athanasopoulos et al. (2015) studied the role of language context during a similarity judgment task. Participants were groups (n=15 per group) of English monolinguals, German monolinguals, English-German bilinguals in an English context, and English-German bilinguals in a German context. All bilinguals were native speakers of German with English as their L2. Nineteen triads of video clips were used as stimuli. Participants were instructed to tell the experimenter whether they thought Clip X, which appeared last, was more similar to Clip A or Clip B. All the target stimuli (Clip X) included an endpoint. The two alternative clips offered a version with and without an endpoint. The analysis showed that German monolinguals and German-English bilinguals in the German context chose motion-completion alternates significantly more often than English monolinguals and German-English bilinguals in the English context. The second experiment added a verbal interference task (repeating a string of three two-digit numbers). A new group of bilinguals was instructed to perform the task simultaneously with a similarity judgment task. Half of the participants started repeating the numbers in English and switched to German halfway through the experiment; the other half did it the other way around. While there were no significant differences between the groups when the numbers were repeated in English, the preference for motion-completion alternates was higher than when they were repeated in German. Additional data from monolinguals (English and German) under the same verbal interference condition (except the switch to the second language) showed no difference. It was concluded that the verbal interference task blocked the effect of that language on the similarity judgment task. Thus, no language influence took place in the case of monolingual speakers. In the case of bilingual speakers, their second language, which was not a language of the verbal interference task, was still accessible and influenced the similarity judgments task (Athanasopoulos et al., 2015).

Flecken, Athanasopoulos, et al. (2015) used EEG in the study on motion event perception. German speakers (n=20) and English speakers (n=20) observed animated videos depicting a dot traveling along a trajectory toward a geometrical shape (endpoint). The dot never reached the endpoint. Four hundred ninety-two prime-target pairs were displayed. Primes are animated video clips lasting one second. After the presentation of each prime, a picture with a target picture was displayed. The picture was either a full match (trajectory and endpoint were the same), a full mismatch (trajectory and endpoint differed), a trajectory match, or an endpoint match (see Figure 3). The event-related potential was measured, and P3 analyses were conducted. The full match condition and the endpoint match condition elicited significantly more positive P3 than the trajectory match condition in German participants. That implies the endpoint was processed with closer attention and perceived with higher salience than the trajectory. On the other hand, there was no difference in P3 in these three conditions in English participants. It was concluded that these findings are evidence of language-specific patterns' influence on non-verbal visual processing.

The results of the studies employing non-linguistic tasks indicate the complexity of the potential language effect on cognitive processes. Different conditions of the same task (such as the co-occurrence of a distracting task of a linguistic or non-linguistic kind) influence the results. For future research, it is vital to explore these effects and, if feasible, expand the participant pool within each group to enhance the robustness of the research.

²The description of the study by Athanasopoulos et al. (2015) occur in large also in 5.2. Since we wanted to list the complete record of the studies examining phasal and holistic perspectives in the non-linguistic context in the methodological part, we assessed the repetition to be justified.

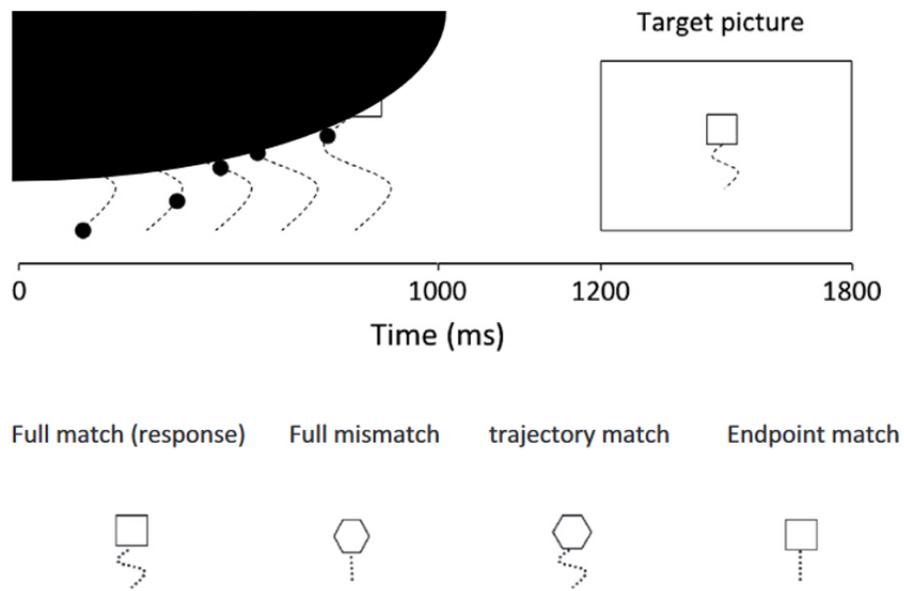


Figure 3: Stimuli from Flecken, Carroll, et al. (2015)

4.2 Participants

When choosing participants for the research, several points must be assessed. We will shortly comment on the main factors we have considered when choosing our population and samples.

4.2.1 Number

The required sample size for data analysis may vary depending on the specific research. To determine an appropriate sample size, researchers are advised to review previous studies that employed similar methods (Arunachalam, 2013).

The number of participants in eye-tracking studies targeting motion events usually ranges between 10-30 participants per task in each language and condition group (e.g., Flecken et al., 2014; Papafragou et al., 2008; Sakarias and Flecken, 2019; Trueswell and Papafragou, 2010, Flecken, Carroll, et al., 2015, Gleitman et al., 2007; see 4.4). In our eye-tracking studies, we have attempted to gain as much eye-tracking data as possible, to strengthen the statistical analysis. We have collected data from 112 adults (55, 23, and 34 per group) for 5.2 and 75 children for the eye-tracking experiment in 5.3.

4.2.2 Language

The crucial variable in the research of language-specific categories has been the native language. Studies focused on holistic and phasal perspectives have shown that language plays a crucial role in describing and perceiving motion events and change-of-state actions. The preference for one of these perspectives is so strong that even highly advanced speakers of L2 with a different preference than their L1 still use the perspective of their native language, even if the action is described in L2 (Schmiedtová, 2013; Schmiedtová, 2011a). We have chosen languages with different perspectives for the cross-linguistic comparison for our studies. To expand the research, we included already-studied languages and a group of speakers of less-studied languages.

An interesting variable in linguistic preferences research is bilingualism. Bilingual children grow up in an environment of two languages and, therefore, in the influence of them. While studies on L2 speakers were done in the research on phasal and holistic perspectives, this dissertation brings a new insight into the speech production of German-Russian bilingual children. Bilingual adults were included in our non-linguistic eye-tracking study.

To date, a relatively small number of studies have addressed the question of how bilingual children acquire conceptual preferences for locomotion events. The studies done so far have been mainly focused on Talmy's lexicalization typology, i.e., on the differences in the expression of path/-manner verbs in satellite- and verb-framed languages (see, e.g., Nicoladis and Brisard, 2002; Aveledo and Athanasopoulos, 2016; Aktan-Erciyev, 2020). To this date, there has been no research conducted on the holistic and phasal preferences among bilingual preschoolers. Additionally, no studies have explored the influence of parental input on the development of corresponding conceptual perspectives.

4.2.3 Socio-economic status

Socio-economic status (SES) is strongly associated with cognitive abilities and achievements during childhood and beyond. The most common indicators of SES are education, occupation, and income (Ganzeboom et al., 1992; Bornstein and Bradley, 2003). It has been shown that language development (complexity of speech, receptive and expressive vocabularies, phonological awareness) differ across SES (Whitehurst, 1996). A study by Noble et al. (2005) brought similar results: "SES associations have been found in all domains of linguistic competence, but especially in lexical-semantic knowledge and phonological awareness" (p. 78). SES has shown a highly significant effect on the perisylvian/language system and prefrontal/executive system. The essential SES measure seems to be parental education: "Parental education most strongly accounted for variance in these two neurocognitive systems" (Noble et al., 2005, p. 82).

The participants we chose for the study came from comparable socio-economical backgrounds. We have followed this rule rigorously in our studies.

4.2.4 Age

In the studies of this dissertation, we have focused on adults and children in our experiments. The age of children, in particular, needs to be controlled since language development is age-dependent in the sense that a child has more time to absorb language information from their surroundings. In many studies about language-specific pattern acquisition, age is used as a variable (e.g., Casasola et al., 2003; Naigles et al., 1998; Pulverman et al., 2008). The studies focusing on the acquisition of language-specific patterns and the perception of motion events in early childhood brought mixed results regarding the age when the child fully starts to use the perspectives. The results of motion event studies are detailed in 5.3 and 5.1 since these articles investigate children’s expression of endpoints. We concentrated on pre-schoolers and investigated the cross-linguistic difference and the potential gradual acquisition of the perspectives.

From the previous studies investigating language-specific patterns in early childhood development, we can assume that phasal and holistic perspectives might be acquired early. Casasola et al. (2003) observed that 10-month-old infants could distinguish between the manner and path components of motion events, while younger infants responded only when both components were changed. Pulverman et al. (2008) extended these findings by demonstrating that children aged 14-17 months can differentiate between the manner and path components, indicating the importance of perceptual recognition for later language acquisition. Interesting findings were also discovered in other areas of spatial cognition. Choi et al. (1999) investigated language-specific patterns in spatial terms, comparing English and Korean descriptions. They revealed the complex relationship between the English preposition "in" and the Korean verb "kitta," which encoded a tight fit rather than general containment. Previous research showed that English-speaking children between 16-20 months produce spatial terms using "in" and "on," while Korean-speaking children use the verb "kitta." Moreover, Choi et al. (1999) found that children aged 18-23 months already understand the language-specific semantic categories. However, Casasola and Cohen (2002) discovered that 10-month-old Korean children did not exhibit the same understanding of the "kitta" term, suggesting a developmental progression. These studies collectively indicate that language-specific categories are acquired during early childhood, potentially before two years of age. Additionally, Hespos and Spelke (2004) found that even 5-month-old infants can distinguish between situations involving tight-fitting objects and those that do not, highlighting the role of language-specific categories in verbalization and perception.

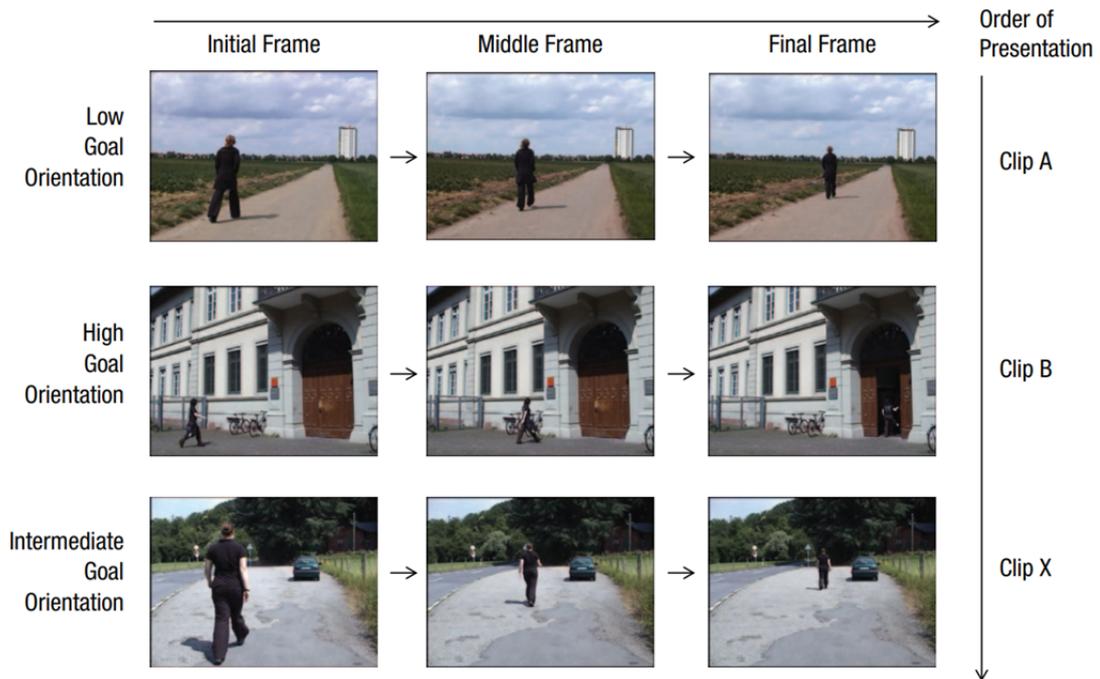


Figure 4: Example of stimuli made by the Heidelberg group. The figure is taken from Athanasopoulos et al., 2015.

4.3 Material

While creating the stimuli for our experiments, we based the design on the methodology from previous studies. Studies on phasal and holistic perspectives have employed stimuli depicting goal-oriented motion events or change-of-state events (e.g., Sahonenko and Schmiedtová, 2008; Schmiedtová, 2011a; Schmiedtová, 2013; von Stutterheim et al., 2012). As seen in 4.4, most elicitation studies targeting endpoints have used short video clips of everyday situations as material. Most of the studies gained the material from the same stimulus pool - from the 60 video clips developed by Christiane von Stutterheim and the Heidelberg research group. The examples of the picture stimuli are displayed in Figure 4. Table 2 provides an example of critical items used in Flecken et al. (2014).

-
1. a van is driving down a country lane (towards a village/houses)
 2. a woman is walking across the parking lot (towards a car)
 3. a woman is walking down an alley (towards a barrier)
 4. a little boy is walking along a path (towards a playground)
 5. a man is climbing up a ladder (to a balcony)
 6. a man is crossing a street (towards a car)
 7. two girls are walking along a path (towards a house)
 8. a girl on a horse is riding (towards an entrance)
 9. a mother and a child are walking through a park (towards a slide)
 10. a car is driving down a road (towards a petrol station)
-

Table 2: The list of critical stimuli used in Flecken et al. (2014).

Using the same pool of stimuli carries advantages: it reassures certain replicability of the results and creates a ‘corpus’ of data from many languages and samples of the population. The disadvantage

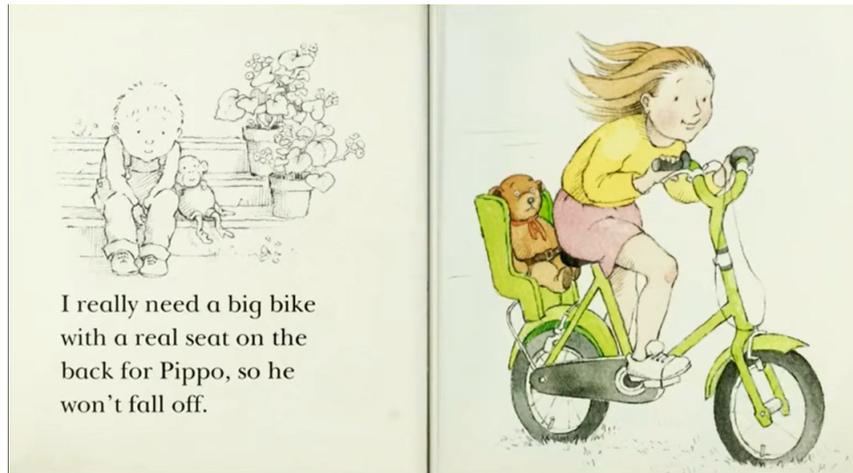


Figure 5: Example of a stimuli used in Kaefer et al. (2017). It is a page from a book *Tom and Pippo and the Bicycle* (Oxenbury, 1997).

is that some idiosyncratic features of the stimuli might affect the results, which may appear in all the studies conducted with the same stimuli.

The second source of inspiration for our stimuli came from the investigations with children. One of our central experiments aimed to elicit a spontaneous conversation between a parent and a child. Therefore, we explored the research area concentrating on eliciting such data in natural settings. Studies focused on picture book reading were a great source of inspiration (for a review, see Fletcher and Reese, 2005). Eye-tracking has rarely been used in this kind of research (but see, e.g., Kaefer et al., 2017). An example of a stimulus from this area is displayed in Figure 5.

In the research on motion events, elicitation of narratives over the picture book *Frog, where are you?* (Mayer, 1987) has a long tradition (see, e.g., Slobin, 2004, and CHILDES corpus of narratives over Frog stories MacWhinney, 2000). We considered this book when constructing our stimuli.

All stimuli used in the experiments of this dissertation were created from scratch and adapted to each study. All of them can be seen in the Appendix section of this dissertation (6). The sets of stimuli are displayed in total for each article. Therefore, some of them appear more than once.

We combined our knowledge about different experimental designs in the research on goal-oriented motion events and the picture-book research with young children to choose our stimuli's design. Firstly, we chose to present participants with static stimuli representing motion events rather than with video clips. The significant advantage was the versatility of this stimulus type. Pictures are very suitable for children, and their usage has a long tradition. The research employing video clips with very young children does not have such a long tradition, and there is a fear of heterogeneous results. Moreover, picture stimuli can be presented on the computer screen, which is suitable for an eye-tracking experiment and a self-paced elicitation task, and they can be printed into a booklet to serve as stimuli for interactive communication between a parent and a child. We used the last mentioned technique to elicit dialogue speech to simulate the ordinary activity of talking over picture books. For elicitation tasks, we always asked the participants *What is happening in the picture?* This fundamental question was modified to fit each particular experiment design. As discovered by piloting our studies, asking only *describe what is in the picture* does not lead participants to converse about events. Especially children tend to list objects in the scene without employing action verbs.

We considered various features of stimuli when creating them, such as color salience, the size of areas of interest, or the directionality of the movement. "There are certain features that need to be controlled when presenting images. We tend to scan a screen with images from left to right (for languages where reading is from left to right), so it is important to counterbalance the location of objects. For example, if condition x always appears on the right side of the screen and condition y on the left side, condition y would likely always be fixated first, not because of the experimental manipulation but because of its position on the screen. In addition, the images should be matched for size and salience as these have been found to influence looking patterns" (Conklin and Pellicer-Sánchez,



Figure 6: Example of a picture from the book *Frog, where are you?* Mayer, 1987.

2016). We considered these recommendations while constructing the stimuli.

Figure 7 presents an example of the stimulus. While representing a goal-oriented motion event, it follows a children-friendly color pallet and the visual style of the stimuli used in research with children, such as in Figure 5 and 6. Compared to the video clips with live human "actors" (Figure 4), we chose various animals to engage children's attention.



Figure 7: Example of the original stimulus.

4.4 Literature overview: Methodology

The following table presents a comprehensive overview of the methodology used in experiments targeting holistic and phasal perspectives.

publication	method	material	participants
von Stutterheim et al., 2002 (Experiment 1)	elicitation speech onset	16 computer animations critical=6; control=2; fillers=8	N=60 (3x20 per group) adults (German, English, Spanish)
von Stutterheim et al., 2002 (Experiment 2)	self-pace reading	15 pairs of ambiguous sentences critical=30	N=55 (20, 19, and 16 per group) adults (German, English, Spanish)
von Stutterheim, 2003	elicitation speech onset	36 video clips of everyday situations critical (motion events)=8; control=6; fillers=20	N=110 (4x20 and 2x15 per group) adults (MS Arabic, English, German, Spanish, L1 German/L2 English, L1 English/L2 German)
von Stutterheim and Nüse, 2003 (Experiment 1)	elicitation	short film <i>Quest</i>	N=34 + ? ³ (17 per group) adults (German, English, Algerian Arabic)
von Stutterheim and Nüse, 2003 (Experiment 2)	elicitation	16 computer animations critical=6; control=2; fillers=8	N=40 + ? ⁴ (20 per group) adults (German, English, Algerian Arabic)

³The number of speakers of Algerian Arabic is not specified in the paper.

⁴See footnote 3.

von Stutterheim and Carroll, 2006	elicitation eye-tracking	80 video clips of everyday situations critical (motion events)=18; control=18; fillers=44	N=120 (6x20 per group) adults (MS Arabic, English, German, Norwegian, L1 English/L2 German, L1 German/L2 English)
Sahonenko and Schmiedtová, 2008	elicitation	40 video clips of everyday situations critical (motion events)=8; control=8; fillers=24	N=120 (3x30 and 2x15 per group) adults (Czech, German, Russian, L1 German/L2 Russian, L1 Czech/L2 Russian)
Schmiedtová, 2010	elicitation	11 short video clips	N=100 (5x20 per group) adults (Czech, German, English, L1 English/L2 Czech, L1 German/L2 Czech)
Schmiedtová, 2011a	elicitation eye-tracking memory task	60 video clips of everyday situations fillers=40; control=12; critical (motion events)=12	N=63 ⁵ (3x21 per group) adults (German, L1 Czech/L2 German, L1 Russian/L2 German)
von Stutterheim et al., 2012	elicitation eye-tracking memory task	60 video clips of everyday situations critical (motion events)=10; control=10; fillers=40	N=120 (6x20 per group) adults (Czech, Dutch, Spanish, German, English, Standard Arabic)
Athanasopoulos and Bylund, 2012 (Experiment 1)	elicitation	12 video clips of goal-oriented motion events	N=40 (2x20 per group) adults (Swedish, English)

⁵The participant count provided is sourced from the main body of the article. However, there is conflicting information in the abstract stating the involvement of 66 participants in the study.

Athanasopoulos and Bylund, 2012 (Experiment 2)	memory-based triads matching online triads matching	19 triads of motion events	N=68 (4x17 per group) adults (Swedish, English)
Athanasopoulos and Bylund, 2012 (Experiment 3)	memory-based similarity judgements	19 triads of motion events	N=30 (2x15 per group) adults (Swedish, English)
Carroll et al., 2012	elicitation	57 video clips of everyday situations	N=30 + ? ⁶ (2x15 per group) adults (French, German, English, L1 French/L2 English, L1 French/L2 German)
Carroll and Flecken, 2012	elicitation	65 real-life video clips including change of state and change of place critical=21; fillers=44	s N=60 (3x20 per group) adults (Dutch, Dutch-German)
Schmiedtová, 2013	elicitation	video clips of everyday situations fillers=24; control=6; critical (2 kinds)=13	N=36 (group of 16, and 20) adults (L1 Czech/L2 English, L1 Czech/L2 German)
van Beek et al., 2013	elicitation	28 short video clips	N=46 (19, 18, 9 per group) adults (Dutch, German, L1 German/L2 Dutch)
Behrens et al., 2013	elicitation	80 video clips of everyday situations	N=163 (58, 52; 53 per group) adults (Dutch, German, Norwegian)

⁶There is no information about the number of monolingual speakers in the paper.

Bylund et al., 2013 (Experiment 1)	elicitation	18 video clips including goal-oriented motion events critical=12; fillers=6	s N=60 (2x25 and 10 per group) adults (Afrikaans, English, Swedish)
Bylund et al., 2013 (Experiment 2)	non-linguistic similarity judgement task	19 triads of motion events	N=53 (2x17 and 19 per group) adults (Afrikaans, English, Swedish)
Flecken et al., 2014	eye-tracking	55 real-world video clips critical=10; control=5; fillers=40	s N=40 (2x20 per group) adults (German, English)
Flecken, Carroll, et al., 2015	elicitation eye-tracking	video clips of everyday situations fillers=37; critical (motion events)=20	N=57 (3x20 per group) adults (French, German, L1 French/L2 German)
Athanasopoulos et al., 2015 (Experiment 1)	similarity judgements	19 triads of motion events	N=90 (6x15 per group) adults (English, German, L1 German/L2 English)
Flecken, Athanasopoulos, et al., 2015 (Experiment 2)	recognition reaction time	492 prime-target pairs full matches=24, full mismatches=372, trajectory/endpoint matches=96	s N=34 (15, 19 per group) adults (German, English)
Flecken, Athanasopoulos, et al., 2015	EEG	492 prime-target pairs oddball paradigm full matches=24, full mismatches=372, trajectory/endpoint matches=96	N=40 (2x20 per group) adults (German, English)

Sakarias and Flecken, 2019	eye-tracking memory task elicitation	54 short video clips of everyday events critical (resultative events)=18; control=18; fillers=18	N=95 (25, 23, 24, 24 per group) adults (Dutch, Estonian)
Liao et al., 2019	elicitation memory task	40 real-life video clips critical=10; control=10; fillers=20	s N=61 (30, 31 per group) adults (Dutch, Mandarin Chinese)
Gerwien and von Stutterheim, 2022	elicitation	60 real-life video clips including motion events critical=12; control=12; fillers=36	N=70 (2x20, and 30 per group) adults (Norwegian, German, English)
Andersen, in press	elicitation	70 real-life video clips including motion events	N=38 (2x19 per group) adults (German, L1 Tunisian Arabic/L2 German)

Table 3: Methodological overview of studies investigating conceptualization of motion and change-of-state events, with emphasis on endpoint/result differences.

Chapter 5

Publications contributing to the cumulative dissertation

In the next section, three consecutive studies will be presented. All of them follow a line of research on linguistic relativity effects in an area of motion events. Previous studies offered convincing evidence that the aspectual system of a native language influences how speakers describe motion events, observe them while preparing for description, and remember them. However, little is known about when these language-specific patterns appear and how strongly they influence us in non-linguistic tasks. Research targeting first language acquisition is lacking as well.

In the first article (5.1), we asked about the sources of the conceptual perspectives. We hypothesized that speakers transfer information about a particular perspective to their children in parental input, which we can observe by measuring attention targeting endpoints in parent-child speech over motion events. For that reason, we compared the groups of parent-child pairs with different language backgrounds: Czech parents and their children as a group with a holistic perspective; Russian parents and their children as a group with a phasal perspective; and a bilingual group of Russian-German parents and their children as a representation of speakers of two languages with different perspectives. Bilingual speakers were included in the research since we wanted to explore how perspective development works in various natural language situations. Studying monolinguals exclusively does not have the potential to uncover the whole truth behind the language perspectives.

Since the first study (5.1) found language-specific patterns in the parental input while talking about the motion events, the second article asks a question of how far the influence of these patterns goes. Is it also prominent in eye-tracking? Do adults of ‘holistic’ languages also focus more on an endpoint while watching the same stimuli as in the first experiment? To answer that question, new data from new participants were recorded (5.2). We created three groups of adult participants – two monolingual groups of speakers of phasal languages (holistic languages, respectively) and one bilingual group of bilingual speakers of both languages. There were no verbalization nor memory tasks following the silent presentation of the stimuli, which made this experiment unique of its kind and exploratory in the area of the scope of influence of language perspectives on motion events perception.

Simultaneously, we conducted the same experiment as in 5.2 with children of the Czech language, exploring if the focus on an endpoint develops with increasing input, i.e., over time. We recorded the eye movements of Czech children of gradually increasing ages from 3;1 to 7;1 and measured their attention to the endpoint part of the motion events. Additionally, we further explored the first article’s findings about the role of parental input. We focused directly on the role of interaction by comparing the elicitation of children encouraged by parents and those eliciting the descriptions of events more on their own.

The three articles offer several points of view on the conceptual perspectives. We shed light on the way if and how the perspectives occur in parental input during spontaneous parent-child communication (5.1), then if these perspectives influence our perception in adulthood (5.2), and then how these perspectives develop in speech production and motion-events perception of young children (5.3). By exploring these various sides of the conceptual perspectives, we are closer to understanding the bigger picture of the concept of linguistic relativity and its effects in the area of motion events.

In all three studies, we emphasized the importance of large participant groups and a transparent

statistics model defined before the data analysis. Understudied languages were consciously included in the studies.

The articles are presented as they were accepted/submitted for publication, but their formatting is adjusted to the style of this dissertation.

5.1 Article 1

By the time of the submission of the dissertation, this paper had been revised according to the comment of two anonymous reviewers who recommended it for publication after revision into the journal WORD. The majority of the article's text was written independently by myself. Elena Panfilova, the second author, also made contributions to the writing, which are indicated by gray font color. Barbara Mertins, the third author, provided valuable feedback during the preparation of the experiments and the writing process. Additionally, she supplied and further developed the original idea of the article as well as the experimental design of the conducted study.

Marklová, A., Panfilova, E. & Mertins, B. (2023). Description of locomotion events: Language-specific patterns in child-directed speech. *WORD*, 69:4, 339-361. DOI: 10.1080/00437956.2023.2269702.

5.2 Article 2

By the time of submitting this dissertation, this article had been accepted after a peer review process for publication in a special volume in the series Diversity and Cognition. The article was written independently by myself. Barbara Mertins, the second author, offered valuable feedback during the preparation of the experiments and the writing process. Moreover, she provided resources to facilitate the conduction of the experiment.

Marklová, A., & Mertins, B. (2023). Perception of Goal-oriented Locomotion Events in Monolingual and Bilingual Adults: Free-viewing eye-tracking study. In B. Mertins & R. Delucchi Danhier (Eds.), *Diversity in Cognition* (Vol. 20, pp. 91–118). Berlin, Germany: Peter Lang Verlag. <https://doi.org/10.3726/b21118>.

5.3 Article 3

By the time of submitting this dissertation, this article had been submitted to a journal for publishing, and it is under review. Barbara Mertins, the second author, played a significant role by providing valuable feedback throughout the preparation of the experiments and the writing process. Furthermore, she contributed by supplying resources to facilitate the execution of the experiments.

Marklová, A. & Mertins, B. (2023). Expression and perception of endpoints during language acquisition: Three studies on Czech. *Studies in applied linguistics*, 14: 2, 7-29. ISSN: 2336-6702.

Chapter 6

Conclusion

The thesis explored the topic of linguistic relativity in the area of goal-oriented motion events. We employed various populations to investigate the scope of the effect of phasal and holistic perspectives in a way it has not been explored before. We expanded the research in two directions. First, we explored the tendencies in expressing endpoints in registers that were not analyzed before: child-directed speech and child speech. Second, we conducted an eye-tracking experiment with a free-viewing task, which did not employ language production or comprehension in an experiment with children and adults. We employed a population that has not yet been at the center of attention: Czech, Russian, and Russian-German children. We examined the effect of the conceptual perspectives on their speech production and visual attention.

Based on our findings, several conclusions can be made:

First, conceptual preferences are acquired during first language acquisition. In the preschool years, significant changes happen in how children express the endpoints in their speech. Our research suggests that interaction with parents enhances the expression of endpoints in the children's speech. The input that parents provide is already rich in language-specific patterns, the expression of endpoints being one of them.

It is crucial to explore all language contexts when generalizing the prevalence of language-specific patterns. The disproportion of endpoints was so far explored in single sentences or short mono-logical utterances. We bring evidence from natural child-parent dialogues and the evidence that the number of endpoints differs between speakers of Russian and Czech. Our data suggest that the acquisition of phasal and holistic perspective and the development of preference in expressing endpoint is very complex. We already have found cross-linguistic differences in how the endpoints are expressed when discussed over stimuli with a very clear or inferred endpoint. We also found out that bilingual parent-children pairs behave in a way that suggests that already preschool children are aware of the importance of endpoints, and the influence of their dominant language may affect the number of endpoints expressed. We discovered that when parents of bilingual children did not pronounce the endpoint, the children did it in many cases (5.1). That was not the case for the monolingual pairs. In our third study (5.3), we found a different amount of statements containing endpoints between Czech and Russian children. While both groups expressed endpoints in a similar total count, the asymmetry of the utterance kind was striking.

Second, we did not find evidence for conceptual preferences' effect on visual perception while the language is not activated. As we know, the scope of linguistic relativity has been surrounded with question marks - does language affect broader cognition outside of language use? Our research is too specific to answer this vital question. However, we concluded that the effects of holistic and phasal perspectives on visual perception might reach a limit when the language is not activated. While studies following the *thinking for speaking* hypothesis have brought convincing evidence about the effects of phasal and holistic perspective in situations when a person silently watches a video while preparing for verbalization, only scattered evidence has been collected on the effect on perception when the language is not activated, or when it is suppressed. Our experiments contained visual inspections of pictures depicting representations of motion events, and they focused on the cumulative fixation time and the entry time into the areas of the endpoint. We did not find an effect in the comparative study of adult speakers of various languages or Czech children of various ages. This dissertation contributes

to the research on the limits of linguistic relativity effects by stating that the boundary of the influence of phasal and holistic perspective might be reached when the speakers observe static representations of motion and events without the prompt to describe them.

Third, our research points to the challenges of the experimental methods, particularly when transitioning from elicitation data comprised of individual utterances to more interactive and dialogical contexts. While single mono-logical utterances are in the vast majority of the same kind (statements), dialogical form is full of turn-taking forms, such as questions, answers, repetitions, etc. It also includes non-verbal communication, which cannot be easily tracked and which was omitted in our research. However, we already touched this layer when encountering utterances such as *tady letí ptáček* ‘here a bird is flying.’ Already here, we needed to interpret the referent of *tady* ‘here’ - did the speaker mean the sky, or simply the picture itself?

And lastly, here are some final remarks:

In the research, we need to find a balance between the artificiality of the experiment setting and the noisiness of real-world situations. We must be careful when generalizing the findings about the effect of language on real-life situations in highly controlled and standardized experiments in the lab. Those experiments are highly important, but the journey should not end there. This dissertation brings insight into the expression of endpoints in spontaneous language and fluent interaction and uncovers the complexity of this kind of data. Next to the above-described complex character of turn-taking, the cultural differences between the speaker’s groups may influence how the conversation is led.

It is essential to include bilinguals in the experiments and not avoid them until there is ‘enough’ evidence from monolinguals. Bilingualism is a widespread language situation, and focusing only on monolinguals can never reflect the entire picture. Our comparative study of Russian, Russian-German, and Czech speakers suggests that language dominance might be a crucial variable regarding phasal and holistic preferences. This assumption needs to be explored further.

Questions related to language acquisition - monolingual and bilingual - should be systematically addressed in the research on holistic and phasal perspectives. While the picture stimuli used in this dissertation worked very well to elicit motion events, they have limitations, especially regarding eye-tracking measures. New, animated video clips might be necessary for eye-tracking research on children. Additionally, while external forces have disrupted our project, we aim to replicate the elicitation experiment conducted with Czech children on Russian children. A cross-linguistic comparison of these data may shed more light on the independence of children’s speech production regarding endpoints.

Finally, one of the outcomes of this dissertation project is a public repository with transcripts of the data collected for 5.1. This repository contributes to open-access science and allows the scientific community to explore motion events further.

To summarize, this dissertation provides insights into how conceptual preferences affect speech production and language acquisition. It brings a more profound understanding of the role of interaction in producing endpoints in early childhood. Moreover, it presents negative evidence about the influence of phasal and holistic perspectives on visual perception in non-linguistic settings. Lastly, it highlights the difficulties encountered in experimental design and emphasizes the importance of including bilingual populations in linguistic studies.

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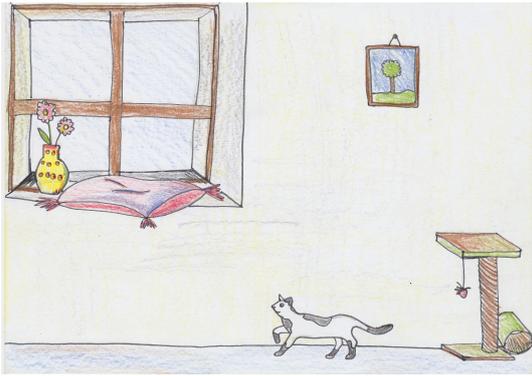
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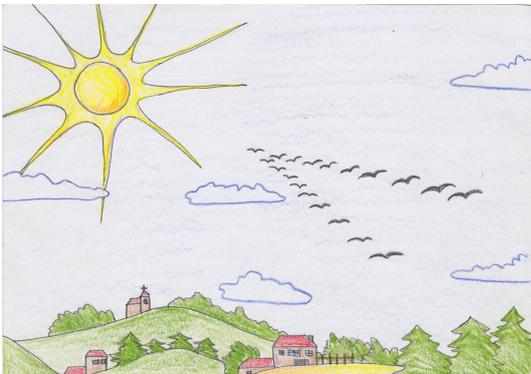
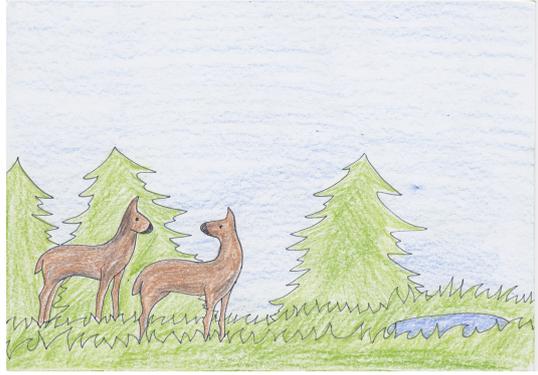
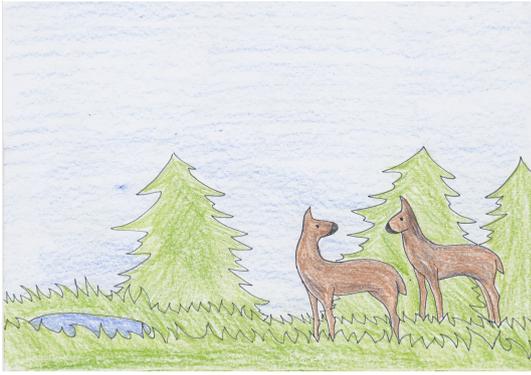
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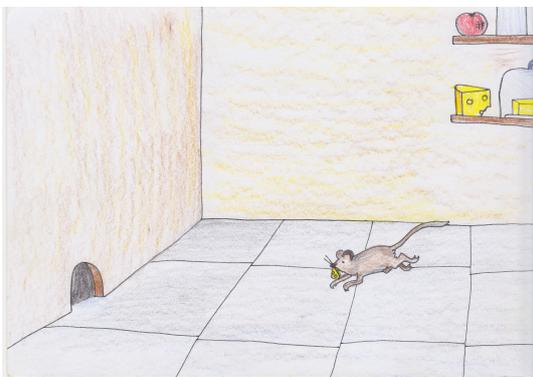
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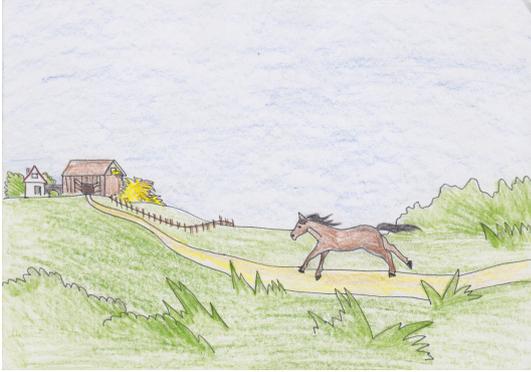
Appendix 1. Stimuli for article 5.1



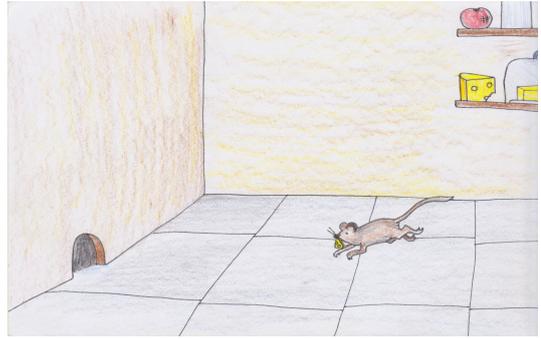


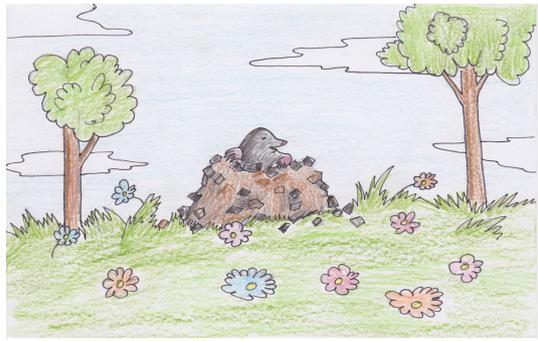
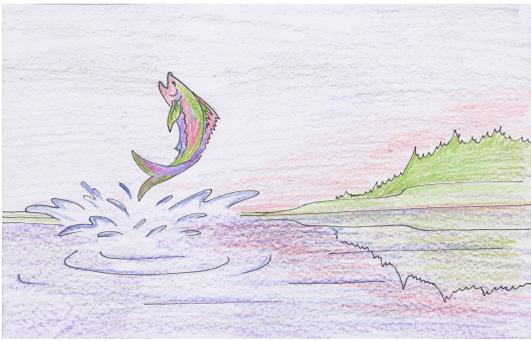
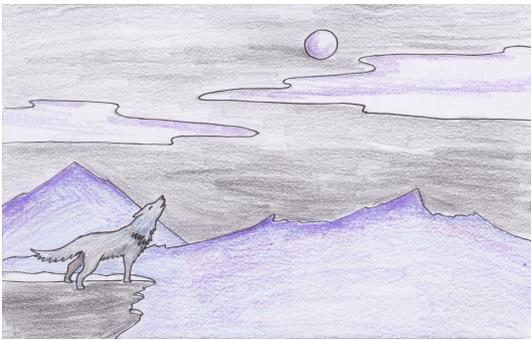
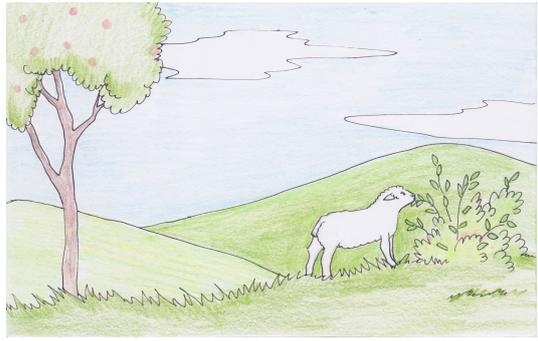


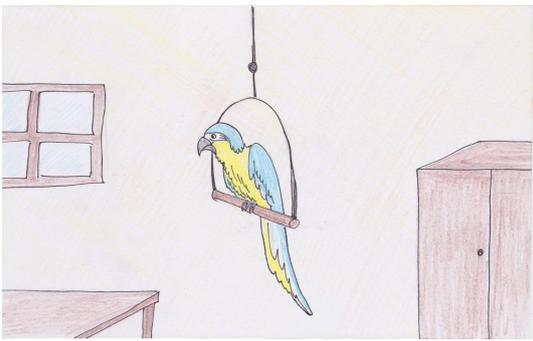
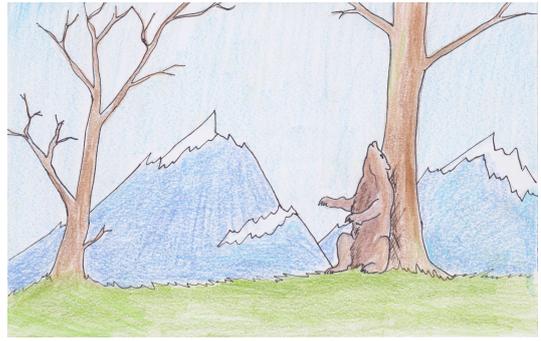




Appendix 2. Stimuli for article 5.2







Appendix 3. Stimuli for the Elicitation task in article 5.3.





Appendix 4. Example of a transcript of a full conversation used in 5.1, from a Czech parent-child pair (M=parent; D=child).

M: kóukej co tady máme.
M: *see what we have here.*
D: motýlka.
D: *a butterfly.*
M: motýlka, a copak dělá ten motýlek?
M: *a butterfly, and what is the butterfly doing?*
D: letí.
D: *flying.*
M: letí, a kam letí?
M: *flying, and where is he flying to?*
D: domů.
D: *home.*
M: domů letí, hm. A kde bydlí motýlek?
M: *he is flying home, hm. And where does the butterfly live?*
D: motýlek musí napapat.
D: *the butterfly must eat.*
M: nejdřív se musí napapat, než poletí domů. Ahá. A co má motýlek tady na hlavičce?
M: *first, it has to eat before flying home. Ah, I see. And what does the butterfly have on its little head?*
D: xxx.
D: *xxx.*
M: hm.
M: *Hm.*
D: křídýlka.
D: *wings.*
M: křídýlka má, no jasně. A víš jakou mají barvu ta křídýlka?
M: *it has wings, of course. And do you know what color those wings are?*
D: jo.
D: *yes.*
M: jo. Jakou?
M: *Yes. What color?*
D: zeenou modrou a celvenou.
D: *green blue and red.*
M: zelenou modrou a červenou mají barvu křídýlka?
M: *The wings have a color of green blue and red?*
D: hm.
D: *hm.*
M: ne.
M: *No.*
D: jo takovou.
D: *yes, like that.*
M: to sou ale kytičky. Zelený modrý a červený.
M: *those are actually flowers. Green, blue, and red.*
D: xxx.
D: *xxx.*
M: motýlek má jaká křídýlka?
M: *what kind of wings does the butterfly have?*
D: nevím.
D: *I don't know.*
M: ale víš. Xxx. (asi vytahuje diktafon z kapsy, přes šum není rozumět (asi 4 slova) jako sluníčko?
M: *but you do know. Xxx. (possibly taking a dictaphone out of pocket, not understandable due to noise (about 4 words) like the sun?)*

D: jako -
D: *like* -
M: a jaké je sluníčko?
M: *and what is the sun like?*
D: nevím.
D: *I don't know.*
M: ále. Jakou barvu má sluníčko?
M: *Oh well. What color is the sun?*
D: &t
D: *xxx.*
M: prosím?
M: *Excuse me?*
D: xxx.
D: *xxx.*
M: žlu
M: *ye-*
D: tou.
D: *llow.*
M: a tady ještě
M: *and here also*
D: &te.
D: *xxx.*
M: jaká je tam ještě barva? čer
M: *what color is there as well? re-*
D: červená.
D: *red.*
M: červená. Tak půjdeme na další obrázek.
M: *red. Let's move on to the next picture.*
D: jo půjdeme.
D: *yes, let's go.*
M: jo? Tak tenhle dáme pryč.
M: *Yes? So let's get rid of this one.*
D: tady je, a tady je domeček.
D: *Here it is, and here is a little house.*
M: tady je domeček. A co tam ještě je?
M: *Here is a little house. And what else is there?*
D: to je kuň koník.
D: *That is a horse, a little horse.*
M: koník tam je. A co dělá koník?
M: *There is a little horse. And what is the little horse doing?*
D: jde.
D: *It's walking.*
M: jde?
M: *Walking?*
D: jo.
D: *Yes.*
M: myslíš, že jde?
M: *Do you think it's walking?*
D: já myslím že.
D: *I think so.*
M: a nebo utíká?
M: *Or is it running?*
D: utíká.
D: *It's running.*
M: utíká?
M: *Running?*

D: jo.
D: *Yes.*
M: a proč myslíš že utíká?
M: *And why do you think it's running?*
D: s a myškou.
D: *Chasing a mouse.*
M: za myškou?
M: *After a mouse?*
D: jo. Za myškou.
D: *Yes. After a mouse.*
M: prosím tě. A ty tam vidíš nějakou myšku?
M: *please. And do you see any mouse there?*
D: jo. Tam vidím -
D: *yes. I see -*
M: kde je myška?
M: *where is the mouse?*
D: je do.
D: *it's inside.*
M: ve stáji je myška?
M: *is the mouse in the stable?*
D: jo jo.
D: *yes, yes.*
M: a jí mu tam papú.
M: *and it eats there, right?*
D: jo.
D: *yes.*
M: aha. Takže koník běží domů.
M: *aha. So the little horse is running home.*
D: jo, domů.
D: *yes, home.*
M: a aby se taky napapal.
M: *and so that he can also eat.*
D: jo.
D: *yes.*
M: a nebo je- běží sníst myšku?
M: *or maybe he's running to eat the mouse?*
D: myšku.
D: *the mouse.*
M: ale né.
M: *but no.*
D: ale né.
D: *but no.*
M: a jaký je koník? Jakou má barvu? Věděla bys?
M: *and what is the little horse like? What color does he have? Do you know?*
D: jo. Jakou má. Takový jako xxx.
D: *yes. What he's like. Something like xxx.*
M: no, jaká to je?
M: *well, what is it?*
D: šedá.
D: *gray.*
D: hnědá.
D: *brown.*
M: a travička je?
M: *and what about the grass?*
D: je takov.
D: *it's like that.*

M: ne, jaká je travička?
M: *no, what is the grass like?*
D: tavika taková.
D: *it's like that, grass.*
M: taková, hm. Jaká je to barva?
M: *like that, huh. What color is it?*
D: jako xxx -
D: *like xxx -*
M: zeená.
M: *green.*
D: zelená.
D: *green.*
M: xxx.
D: *xxx.*
M: a další, jo?
M: *And next, yes?*
D: dalsí.
D: *Next one.*
M: a co to je na obrázku?
M: *And what is that in the picture?*
D: nějaká kosa.
D: *Some kind of goat.*
M: nějaká koza? M: *Some kind of goat?*
D: jo.
D: *Yes.*
M: hm, já si nejsem jistá, jestli je to koza, zlatíčko, dyž tady je psí bouda.
M: *Hm, I'm not sure if it's a goat, sweetheart, when there's a doghouse here.*
D: bouda.
D: *Doghouse.*
M: tak to asi bude pejsek.
M: *So it's probably a little dog.*
D: pejsek.
D: *Little dog.*
M: hm. Tak co dělá to zvířátko teda?
M: *Hm. So what is the little animal doing then?*
D: utíká.
D: *It's running.*
M: a kam utíká?
M: *And where is it running to?*
D: za myškou.
D: *After the mouse.*
M: za myškou? Jo tady je -
D: myška.
D: *Mouse.*
M: jo, na dalším obrázku je myška. Aha. A co dělá myška?
M: *Yes, on the next picture there's a mouse. I see. And what is the mouse doing?*
D: de sa mnou.
D: *It's going after me.*
M: de za mnou?
M: *It's going behind me?* D: jo, de sa mnou.
D: *Yes, it's going after me.*
M: ne. Co má v pusince?
M: *No. What does it have in its mouth?*
D: náky sanou moda.
D: *Some piece of blue cheese.*
M: nákej kousek -

M: *Some piece -*
D: kousek gody
D: *piece of blue cheese.*
M: sý-ru.
M: *cheese*
D: sýru. D: *cheese.*
M: a ten tady vzala.
M: *And it took it from here.*
D: jo.
D: *Yes.*
M: jo?
D: jo.
M: a teď s nim běží kam?
M: *And now it's running with it where?*
D: domitku na napapat.
D: *To the little house to eat.*
M: do domečku s nim běží se napapat, ano.
M: *It's running to the little house with it to eat, right?*
D: jo.
D: *Yes.*
M: a jakou barvu má myška? M: *And what color is the mouse?*
D: já nevím.
D: *I don't know.*
M: ále. hnědá.
M: *Oh. Brown.*
D: nědá.
D: *Brown.*
M: hm. Tak jo, tak dem na další obrázek?
M: *Oh. Brown.*
M: *Hmm. Okay, let's move on to the next picture?*
D: jo dem.
D: *Yes, let's move on.*
M: a tady je co prosimtě?
M: *And what do we have here, please?*
D: pavuk!
D: *A spider!*
M: to není pavouk.
M: *That's not a spider.*
D: jo.
D: *Yes.*
M: není.
M: *It's not.*
D: je žába.
D: *It's a frog.*
M: to je žába, jasně. A co dělá žába?
M: *That's a frog, of course. And what is the frog doing?*
D: běží do budy.
D: *It's running into the pond.*
M: cože dělá do tý vody?
M: *What is it doing in the water?*
D: &t káče.
D: *It's jumping into the water.*
M: skáče do vody. A co dělá žába ve vodě?
M: *It jumps into the water. And what does the frog do in the water?*
D: skáče.
D: *It jumps.*

M: ne, co dělá žabička dyž je ve vodě?
M: *No, what does the little frog do when it's in the water?*
D: káče.
D: *It jumps.*
M: umí -
M: *Does it know how to -*
D: umí oup.
D: *It knows how to swim.*
M: umí plavat?
M: *Can it swim?*
D: umí plavat.
D: *It can swim.*
M: ano nebo ne?
M: *Yes or no?* D: jo.
D: *Yes.*
M: jo?
M: *Yes?*
D: jo.
D: *Yes.*
M: a co má ta žabička v tý vodě? Co tam ještě dělá?
M: *And what does the little frog have in the water? What else is it doing there?*
D: táky táky.
D: *Cáky cáky.*
M: cáky cáky, no určitě. Ta je spokojená.
M: *Cáky cáky, definitely. It's content.*
D: je s.
D: *It's con-.*
M: a tady je co?
M: *And what's here?*
D: suníčko.
D: *Sun.*
M: sluníčko.
M: *Sun.*
D: jo.
D: *Yes.*
M: a tady na obloze sou co?
M: *And what's in the sky here?*
D: boji etě au.
D: *Birds are there.*
M: to není ero.
M: *That's not a heron.*
D: ko alo.
D: *xxx.*
M: t není éro.
M: *That's not a plane.*
D: to popodá elo.
D: *That looks like plane.*
M: takle nevypadá éro přeci.
M: *That's not how a plane looks.*
D: vopadá.
D: *It looks like it.*
M: ale. ((smích))
M: *But. ((laughter))*
D: xxx.
D: *xxx.*
M: to sou přeci ptáčci.

M: *Those are birds, aren't they?*
D: táči.
D: *Birds.*
M: ptáčci, a co dělají ptáčci?
M: *Birds, and what do birds do?*
D: hop hop a -
D: *Hop hop and -*
M: ne, co co dělají?
M: *No, what do they do?*
D: dou.
D: *walk.*
M: dou?
M: *walk?*
D: dou.
D: *walk.*
M: nejdou.
M: *No, they don't walk.*
D: letí.
D: *They fly.*
M: letí, a kam letí?
M: *They fly, and where do they fly?*
D: domů.
D: *Home.*
M: letí domů?
M: *They fly home?*
D: jo.
D: *Yes.*
M: letí za sluníčkem?
M: *They fly towards the sun?*
D: tetí za suníckem.
D: *Towards the sun.*
M: ha, a co je tady na té obloze ještě?
M: *Ah, and what else is in the sky here?*
D: so side napapat.
D: *Sunflower to eat.*
M: sluníčko.
M: *Sun.*
D: suníčko napapat.
D: *Sunflower to eat.*
M: sluníčko se de napapat?
M: *The sunflower goes to eat?*
D: jo.
D: *Yes.*
M: sluníčko nepapá.
M: *The sun doesn't eat.*
D: napapat.
D: *To eat.*
M: další obrázek.
M: *Next picture.*
D: a tady ko náká koza.
D: *And here's a goat.*
M: náká koza. A co dělá ta koza prosimtě?
M: *Some goat. And what is the goat doing, please?*
D: letí.
D: *Flying.*
M: ale. Neletí, co dělá?

M: *But no, it's not flying. What is it doing?*
D: dea hopop.
D: *It's hopping.*
M: dělá hop hop tady z jednoho kraje skály na druhý. Ano? A co tady roste?
M: *It's hopping from one end of the rock to the other. Right? And what's growing here?*
D: kytí ka.
D: *Flowers.*
M: kytí, a nebo tráva?
M: *Flowers, or grass?*
D: táva.
D: *Grass.*
M: tráva. A koza co – proč skáče?
M: *Grass. And why is the goat jumping?*
D: ploč káče.
D: *why jumping.*
M: no?
M: *Well?*
D: děá op op.
D: *It hops hop.*
M: no dělá hop hop, ale proč? Protože tady nemá žádnou pevnou půdu pod nohama, musí to přeskočit.
M: *Well, it hops hop, but why? Because it doesn't have solid ground under its feet, it has to jump over it.*
D: čit.
D: *Jump over it.*
M: musí to přeskočit, no. Jinak by udělala co?
M: *It has to jump over it, right? Otherwise, what would it do?*
D: bac do budy.
D: *Jump into the water.*
M: bác do vody? To asi nebude voda, tam asi bude nějaká propast zdola.
M: *Jump into the water? It's probably not water; there must be some kind of abyss down there.*
D: popas?
D: *Abyss?*
M: hm. Asi jo.
M: *Hm. Probably.*
D: vane to to je.
D: *That's how it is.*
M: další obrázek?
M: *Next picture?*
D: jo.
D: *Yes.*
M: jo? A tady je co na tom obrázku?
M: *Yes? And what's here in this picture?*
D: domeček a -
D: *A little house and -*
M: domeček, hm.
M: *A little house, hm.*
D: a a a a -
D: *And and and -*
M: a co je tadyto?
M: *And what is this?*
D: tadyto je nějaká mau.
D: *This is a little cat.*
M: nějaká mau. A mau je co prosímte?
M: *A little cat. And what is a mau, please?*

D: totika.
D: *A kitten.*
M: kočička. A co dělá ta kočička?
M: *Kitty. And what is the kitty doing?*
D: de.
D: *It goes.*
M: de, a kam de?
M: *It goes, and where does it go?*
D: domu napapat.
D: *Home to eat.*
M: myslíš že se de napapat?
M: *Do you think it's going to eat?*
D: jo.
D: *Yes.*
M: a nejde si třeba tady hajnout?
M: *And isn't it going to take a nap here, perhaps?*
D: jo. Ha haj a pekně sama. A bude nebo net tíka.
D: *Yes. Ha, it will nap all alone. And will it have a little pillow or not?*
M: bude spinkat?
M: *Will it sleep?*
D: jo.
D: *Yes.*
M: no, to je možný, tady má polštářek.
M: *Well, that's possible. It has a little pillow here.*
D: jo.
D: *Yes.*
M: jo? A tam asi udělá hají a bude na něm spinkat. Jo?
M: *Yes? And it will probably make a nest there and sleep on it. Right?*
D: my tako má nane taky máme doma.
D: *We have a little one just like that at home.*
M: taky máme malou doma?
M: *We have a little one at home too?*
D: jo.
D: *Yes.*
M: jo? A co dělá ta mau?
M: *Yes? And what is the kitty doing?*
D: nevím.
D: *I don't know.*
M: nevíš?
M: *You don't know?*
D: ne.
D: *No.*
M: nespinká třeba pejskovi na pelíšku?
M: *Isn't it sleeping on the dog's bed, perhaps?*
D: pejskovy na pelíku.
D: *The dog's on the bed.*
M: spinká vid'?
M: *It's sleeping, right?*
D: tíká.
D: *sleep.*
M: a koukej, co je tady. M: *Look, what's here.* D: pipí. D: *bird.*
M: pipí. M: *bird.* D: xxx. D: *xxx.* M: ne,
ne, ne. A co dělá pipí, mi řekni? M: *No, no, no. And what is pipí doing? Tell me.* D:
tí. D: *It's flying.* M: letí, ale kam letí? M: *It's flying, but where*
is it flying? D: domů napapat. D: *Home to eat.* M: Ten se letí
napapat domů. No, ale proč se letí napapat? Co tady padá? Co se tam děje na tom obrázku? M:

He's flying home to eat. Well, but why is he flying to eat? What's falling here? What's happening in that picture? D: bubiky. D: Bubbles.

M: Bublinky? No, to je asi sníh. To asi nejsou bublinky.

M: Bubbles? No, that's probably snow. They're probably not bubbles.

D: sníh k k.

D: Snow. K K.

M: Padá sníh.

M: Snow is falling.

D: Padá sníh. A padá sníh na budu.

D: Snow is falling. And snow is falling on the house.

M: Na vodu? Ne. Tadyto bude co?

M: On the water? No. What will this be?

D: tomečky.

D: Trees.

M: Stromečky. Takže to bude asi nějaký les.

M: Trees. So it will probably be some kind of forest.

D: Les.

D: Forest.

M: Les.

M: Forest.

D: Les.

D: Forest.

M: Jo? A pipí, co dělá?

M: Yes? And what is pipí doing?

D: Letí napapá.

D: Flying to eat.

M: Letí se napapat, aby mu bylo teplo?

M: Flying to eat to keep warm?

D: Tepo.

D: Warm.

M: Jo? Aby měl sílu?

M: Yes? To have strength?

D: Sílu.

D: Strength.

M: No, aby přežil zimu?

M: Well, to survive the winter?

D: Zimu.

D: Winter.

M: Ano.

M: Yes.

D: A be by xxx a dělá dobře na tyka.

D: And it's good for the bird.

M: Ne, napa- cože že padá sníh a jestli má křídla?

M: No, no- what, that snow is falling, and if it has wings?

D: Jo.

D: Yes.

M: No, má křídla pipí.

M: Well, pipí has wings.

D: Ale kdo ze pozle na tika možná na tika no a co xxx.

D: But who from the xxx to the bird xxx, well, and what xxx.

M: No a co musí dělat ptáček těmi křídly, aby mohl letět?

M: Well, what must the bird do with those wings to be able to fly?

D: Domu.

D: Home.

M: Co musí dělat?

M: What must it do?

D: Ná.
D: *na.*
M: Musí mávat přece.
M: *It must flap them, of course.*
D: Mávat.
D: *Flap.*
M: Mávat křídly, aby mohl letět.
M: *Flap its wings to be able to fly.*
D: Letět domu.
D: *Fly home.*
M: No, letět domu.
M: *Well, fly home.*
M: A tady máme co? Hele. Tady je další pipi?
M: *And what do we have here? Look. Is this another bird?*
D: *dasí pipi.*
D: *Different bird.*
M: No. A tam je co?
M: *No. And what's there?*
D: *cáp.*
D: *Stork.*
M: Čáp?
M: *Stork?*
D: pá těká kap.
D: *Flaps its wings, the stork.*
M: Klapy klap dělá čáp?
M: *Does the stork flap its wings?*
D: jo.
D: *Yes.*
M: Má velký zobák?
M: *Does it have a big beak?*
D: jo. Veký zobák.
D: *Yes. Big beak.*
M: A tím dělá klapy klap?
M: *And it flaps its wings like that?*
D: jo. Taky taky.
D: *Yes. Just like that.*
M: Taky mám udělat klapy klap, takhle? ((klape rukama))
M: *Should I flap my wings like that too? ((claps hands))*
D: jo.
D: *Yes.*
M: Teda, my sme dva čápi?
M: *Well, are we two storks?*
D: jo, da cápi.
D: *Yes, two storks.*
M: Aha. A řekneš mi, kde takový čáp bydlí? Věděla bys?
M: *I see. And can you tell me where such a stork lives? Do you know?*
D: jo, na domišku.
D: *Yes, on a little house.*
M: Na domečku?
M: *On a little house?*
D: na domešku bydlí.
D: *It lives on a little house.*
M: Já bych řekla, že takhle na tom komíně.
M: *I would say it's on the chimney like this.*
D: na tomíně bydlí. A us nejde mami možná napapat?
D: *It lives on the chimney. And can't it go and get some food, mom?*

M: No, tam si postaví hnízdo vždycky, jo?
M: *Well, it always builds a nest there, right?*
D: a de tam pa potom napapat.
D: *And it goes there to get some food.*
M: A při- a pak do toho hnízda, tam se mu narodí mládátka, a pa D: pse potom xxx še
še -
M: *And then in that nest, its babies are born, and then it... D: I think it...*
M: Musí jim dávat papů, aby se aby ta zvířátka aby ta mládátka přežila, jo?
M: *It has to feed them so that the animals, the babies, survive, right?*
D: de káp. De kap kap taky káp.
D: *It feeds them. It feeds them so they survive.*
M: Takle dělá klap klap, jasně. Ten to ale umí ten čáp. Tak se koukneme na další?
M: *That's how it flaps its wings, right. That stork is really good at it. So shall we look at
the next one?*
D: jo.
D: *Yes.*
D: jo, další.
D: *Yes, another one.*
M: A tady je co?
M: *And what do we have here?*
D: zadí.
D: *Hare.*
M: Zajíc. A co dělá zajíc?
M: *Hare. And what does the hare do?*
D: dá, síse utíká.
D: *Runs away, very fast.*
M: Utíká? A věděla bys, jak utíká takový zajíc?
M: *Runs away? Do you know how a hare runs?*
D: jo.
D: *Yes.*
M: A co dělá u toho? Dělá spíš hopi hop takový.
M: *And what does it do while running? It hops, right?*
D: opi hop.
D: *Hops.*
M: Hm. A co má tady na hlavičce ten zajíc? Co má dlouhý-
M: *Hm. And what does the hare have on its head? What's long-*
D: uši.
D: *Ears.*
M: Dlouhý uši. A asi si de taky najít nějaký papú, hele.
M: *Long ears. And it's probably looking for some food, right?*
D: papú.
D: *Food.*
M: No, tadyto bude asi nějaké pole.
M: *Well, there must be a field here.*
D: le. Xxx.
D: *Yes. Xxx.*
M: Hm, a zajíc asi běží někam na papu.
M: *Hm, and the hare is probably running somewhere for food.*
D: de vuša.
D: *Goes to find it.*
M: Vosa?
M: *Wasp?*
D: No de je vosa
D: *No, there is a wasp.*
M: No, to asi nebude vosa.
M: *Well, it probably isn't a wasp.*

D: xxx.
D: *Xxx.*
P: Vlaštovka
M: Tak se podíváme na další?
M: *So let's look at the next one?*
D: de je papí.
D: *Yes, there's a bird.*
M: Tady je pipí, a co dělá pipí?
M: *Here's a birdie, and what does it do?*
D: je s delá delá -
D: *It flies.*
M: Letí pipí? Takže má co, když letí?
M: *Birdie flies? So it has what when it flies?*
D: tidýlka.
D: *Wings.*
M: Má křídýlka. A co musí dělat křídly, aby mohla letět?
M: *It has wings. And what do the wings have to do to fly?*
D: domů napapat.
D: *Go home and eat.*
M: No, tady má hnízdo, jo? A kdo bude nejspíš v hnízdě?
M: *Well, there's a nest here, right? And who will probably be in the nest?*
D: já.
D: *Me.*
M: Ty budeš v hnízdě?
M: *You'll be in the nest?*
D: jo.
D: *Yes.*
M: Prosim tě. To ne, tam budou asi nějaká mláďátka.
M: *Please. No, there will probably be some babies there.*
D: máďátka.
D: *Babies.*
M: A pipí jim asi shání potravu, nebo třeba staví to hnízdo, to nevíme. Jo?
M: *And birdie is probably looking for food for them, or maybe building the nest, we don't know. Right?*
D: a pak je musí xxx papat.
D: *And then it has to feed them.*
M: Musí lítat?
M: *It has to fly?*
D: lítat.
D: *Fly.*
M: Jo? Líbily se ti obrázky?
M: *Yes? Did you like the pictures?*
D: líbily. Etě jenou!
D: *I liked them. One more time!*
M: Ještě jednou?
M: *One more time?*
D: Jo.
D: *Yes.*
M: Tak jo, tak si je pak prohlídнем ještě jednou, jo?
M: *Alright, then let's look at them one more time, okay?*
D: Jo.
D: *Yes.*

Appendix 5. Example of a transcript of a full conversation used in 5.1, from a Russian parent-child pair (M=parent; D=child).

D: так
D: *So*
M: что на картинке нарисовано?
M: *What is drawn in the picture?*
D: Снег
D: *Snow*
M: А как домик называется, где хлебушек лежит?
M: *What is the name of the house where the loaf is placed?*
D: Кормушка.
D: *Feeding trough.*
M: В квартире? Может на кухне?
M: *Inside the apartment? Maybe in the kitchen?*
D: Да, она на кухне.
D: *Yes, it's in the kitchen.*
M: Что она несет?
M: *What is she carrying?*
D: Сыр.
D: *Cheese.*
M: А-а-а, она стащила сыр. Даже видно откуда она его откусила.
M: *Ah, she stole the cheese. You can even see where she took a bite from.*
D: Да
D: *Yes*
M: Видишь этот кусочек?
M: *Do you see this piece?*
D: Ага
D: *Yes*
M: Покажи, где он? На полке
M: *Show me where it is? On the shelf*
D: Да
D: *Yes*
M: лежал сыр. Мышь стащила и куда она его несет?
M: *There was cheese. The mouse stole it, and where is she taking it?*
D: К себе в норку.
D: *To her burrow.*
M: Да у нее есть там у полу такая норка, она туда все тащит.
M: *Yes, she has a burrow there by the floor, and she drags everything there.*
M: Так, а здесь на этой картинке?
M: *Okay, what about this picture here?*
D: Зайчик?
D: *A bunny?*
M: Зайчик. Где он находится?
M: *A bunny. Where is it located?*
D: В лесу.
D: *In the forest.*
M: Ну здесь не совсем лес. Лес, вот, вдалеке немножко, да?
M: *Well, it's not exactly a forest here. The forest is a bit further away, right?*
D: Да
D: *Yes*
M: А он бежит где?
M: *Where is he running?*
D: на песке.
D: *On the sand.*

M: по полю.
 M: *Across the field.*
 D: по полю.
 D: *Across the field.*
 M: тут такое поле, оно уже пожелтело, это, наверное, осеннее поле.
 M: *There's such a field, it has already turned yellow, probably an autumn field.*
 D: да.
 D: *Yes.*
 M: Видишь, травка уже желтенькая. И он бежит по полю в лес.
 M: *You see, the grass is already yellowish. And he's running across the field into the woods.*
 D: да.
 D: *Yes.*
 M: Может быть за ним заяц, этот, лиса гонится?
 M: *Maybe there's a hare chasing him, or a fox?*
 D: Да, может.
 D: *Yes, maybe.*
 M: и он хочет скорее убежать.
 M: *And he wants to run away quickly.*
 D: Да, точно, за ним лиса гонится. Теперь давай ХХХ.
 D: *Yes, exactly, a fox is chasing him. Now let's do XXX.*
 M: здесь на картинке
 M: *Here in the picture*
 D: лошадь.
 D: *A horse.*
 M: лошадь. Она
 M: *A horse. It*
 D: бе+/.
 D: *Is running*
 M: Она бежит.
 M: *It's running.*
 D: она бежит к себе +/...
 D: *It's running to its home...*
 M: +<по дорожке, да?
 M: *On the path, right?*
 D: она бежит по дорожке.
 D: *It's running on the path.*
 M: К себе.
 M: *Towards its -*
 D: домой
 D: *Home*
 M: домой. А как у нее домик называется?
 M: *Home. What is her house called?*
 D: солома
 D: *Straw*
 M: конюшня
 M: *Stable*
 D: подожди, еще так скажи.
 D: *Wait, say it like that again.*
 M: конюшня
 M: *Stable*
 D: скажи, где ее домик?
 D: *Tell me, where is her house?*
 M: где ее домик?
 M: *Where is her house?*
 D: в конюшне

D: *In the stable*
M: так, да, все лошади живут в конюшне.
M: *Right, yes, all the horses live in the stable.*
D: да
D: *Yes*
M: это какая-то, наверное, деревня здесь нарисована
M: *This is probably a village drawn here*
D: да, теперь давай +/...
D: *Yes, now let's +/...*
M: +<или село
M: *Or a village*
D: послушаем
D: *Let's listen*
M: Что здесь нарисовано на картинке?
M: *What is drawn in the picture?*
D: Здесь нарисованы голуби и солнышко и и и облака, и домики, и деревья.
D: *There are drawn pigeons, the sun, and-and-and clouds, houses, and trees.*
M: да. На небе светит яркое солнце.
M: *Yes. The bright sun is shining in the sky.*
D: да
D: *Yes*
M: птицы? Что птицы что птицы делают?
M: *Birds? What are birds doing?*
D: летят
D: *They are flying.*
M: улетают
M: *They are flying away.*
D: да
D: *Yes.*
M: на юг
M: *To the south.*
D: да
D: *Yes.*
M: или наоборот прилетают?
M: *Or are they coming back?*
D: прилетают
D: *They are coming back.*
M: скорее всего они прилетают, потому что уже наступила весна
M: *Most likely they are coming back because spring has already arrived.*
D: да
D: *Yes.*
M: зазеленело все вокруг и птицы возвращаются
M: *Everything around has turned green and the birds are coming back.*
D: назад
D: *Back.*
M: да, из теплых стран
M: *Yes, from warm countries.*
D: Угу
D: *Uh-huh.*
M: А здесь кто такая?
M: *And who is this here?*
D: Кошка
D: *A cat.*
M: Кошка. Где она находится?
M: *A cat. Where is she?*

D: Сейчас на полу
D: *She's on the floor right now.*
M: В квартире или где она, на улице?
M: *Inside the apartment or outside?*
D: В квартире
D: *Inside the apartment.*
M: В квартире. Так, что она только что делала эта кошка?
M: *Inside the apartment. So, what was this cat doing just now?*
D: Она, она, она прыгнула на пол, а потом хочет сюда заблаться
D: *She, she, she jumped onto the floor, and now she wants to climb up here.*
M: Сюда, это куда сюда?
M: *Here, where is here?*
D: На подушку, на подоконник
D: *On the pillow, on the windowsill.*
M: На подоконнике лежит подушка, да? Она играла в своем игровом
уголке и теперь устала и хочет полежать, посмотреть в окошко, да?
M: *There's a pillow on the windowsill, right? She was playing in her play corner and
now she's tired and wants to lie down, look out the window, right?*
D: да
D: *Yes.*
M: Это кто такой?
M: *Who is this?*
D: Гусь.
D: *Goose.*
M: Гусь. А что он делает гусь это?
M: *Goose. What does a goose do?*
D: +<ну он хочет полететь в свое озеро покупаться.
D: *Well, it wants to fly to its lake and swim.*
M: Да, он спускается к озеру, садится, да?
M: *Yes, it goes down to the lake, sits down, right?*
D: да.
D: *Yes.*
M: Он летал, летал, устал,
M: *He was flying, flying, got tired,*
D: и потом он вспотел и решил освежиться.
D: *and then he sweated and decided to cool off.*
M: Вспотел, да? Ммм, он, наверное, еще и проголодался.
M: *He sweated, right? Mmm, he probably got hungry too.*
D: Да.
D: *Yes.*
M: А его еда это что?
M: *What is his food?*
D: рыба.
D: *Fish.*
M: рыба, которая плавает.
M: *Fish that swims.*
D: в море.
D: *In the sea.*
M: да, в море, в реке, в озере.
M: *Yes, in the sea, in the river, in the lake.*
D: да.
D: *Yes.*
M: Да, сейчас он будет ее ловить.
M: *Yes, now he will catch it.*
D: угу.
D: *Mhm.*

M: хорошо.
 M: *Good.*
 M: А на этой картинке что изображено?
 M: *And what is depicted in this picture?*
 D: (laughing)
 D: *laughing*
 M: Х, кто это такой?
 M: *Huh, who is that?*
 D: Тилоп.
 D: *Tilop.*
 M: Кто?
 M: *Who?*
 D: Тилоп.
 D: *Tilop.*
 M: Антилопа?
 M: *Antelope?*
 D: Антилопа, да.
 D: *Antelope, yes.*
 M: Ммм, мне кажется, это козлик.
 M: *Mmm, I think it's a kid goat.*
 D: Козлик.
 D: *Kid goat.*
 M: А что же он делает?
 M: *What is he doing?*
 D: Бежит.
 D: *Running.*
 M: Козлик. Посмотри, тут был обрыв. Он перепрыгивает с одной стороны на другую.
 M: *Kid goat. Look, there was a cliff here. He is jumping from one side to the other.*
 D: Да.
 D: *Yes.*
 M: А там ущелье. Это горный козлик.
 M: *And there's a gorge. This is a mountain goat.*
 D: Да.
 D: *Yes.*
 M: Живет в горах.
 M: *It lives in the mountains.*
 D: Угу.
 D: *Mhm.*
 M: Ему приходится перепрыгивать через ущелье.
 M: *He has to jump across the gorge.*
 D: Да.
 D: *Yes.*
 M: Что на этой картинке нарисовано?
 M: *What is drawn in this picture?*
 D: Я сейчас посмотрю чуть-чуть.
 D: *Let me take a quick look.*
 M: Вот на этой, Х.
 M: *Look at this one, (name of the child).*
 D: Ну, чуть-чуть.
 D: *Well, just a little bit.*
 M: Нет, потом на эту посмотрим. Сначала на эту давай посмотрим. Кто это такая?
 M: *No, we'll look at that later. Let's start with this one. Who is this?*
 D: Это ласточка.
 D: *It's a swallow.*

M: Ласточка. А она куда летит?
M: *Swallow. And where is she flying to?*
D: К себе в домик.
D: *To her house.*
M: В домик. Как ее домик называется у ласточки?
M: *To the house. What is her house called for the swallow?*
D: Дом.
D: *House.*
M: У птичек как домики называются?
M: *What are the houses of birds called?*
D: Ластопонички.
D: *(invented word)*
M: Гнездышки.
M: *Nests.*
D: Гнездышки.
D: *Nests.*
M: +<гнездышки. Какое у ласточки гнездышко? Слеплено из глины, да?
M: *+<Nests. What kind of nest does a swallow have? Made of clay, right?*
D: да.
D: *Yes.*
M: У аиста оно сделано из соломы, из веток.
M: *For a stork, it's made of straw, from branches.*
D: да.
D: *Yes.*
M: а у ласточки из глины. А когда к нам ласточки прилетают?
M: *But for a swallow, it's made of clay. And when do swallows arrive to us?*
D: летом.
D: *In the summer.*
M: ну, чуть пораньше, не летом, а когда?
M: *Well, a little earlier, not in the summer, but when?*
D: а осенью.
D: *Oh, in the autumn.*
M: весной, да?
M: *In the spring, right?*
D: а, сейчас.
D: *Oh, right now.*
M: когда просыпаются жучки
M: *When do bugs wake up?*
D: Мама подожди, еще так скажи.
D: *Wait, Mom, say it again like that.*
M: Когда к нам ласточки прилетают?
M: *When do the swallows fly to us?*
D: Э, весной.
D: *Uh, in the spring.*
M: Правильно. А откуда они к нам прилетают?
M: *Right. And where do they fly from to us?*
D: Нет, я лучше буду ласточкой. А ты будешь папой-ласточкой.
D: *No, I'd rather be a swallow. And you can be a daddy swallow.*
M: Откуда она прилетает, X, к нам ласточка-то?
M: *Where does the swallow fly from to us, X?*
D: Из своего глиняного домика.
D: *From its clay house.*
M: Из теплых стран, да? Они там зимуют.
M: *From warm countries, right? They hibernate there.*
D: +еще раз скажи так же.

D: *Say it like that again.*
M: Когда ласточки к нам прилетают?
M: *When do the swallows fly to us?*
D: Да не так.
D: *No, not like that.*
M: Откуда они к нам прилетают?
M: *Where do they fly from to us?*
D: Из теплых стран.
D: *From warm countries.*
M: Молодец, умница.
M: *Well done, smartie.*
M: Посмотри, на картинке кто нарисован?
M: *Look, who is drawn in the picture?*
D: Аист.
D: *Stork.*
M: Аист. Он летит. А куда он летит?
M: *Stork. It's flying. Where is it flying to?*
D: Он летит к своим яйцам.
D: *It's flying to its eggs.*
M: да. Посмотри, на картинке есть трубы, а на трубах – гнезда.
Как ты думаешь, чьи это гнезда?
M: *Yes. Look, there are pipes in the picture, and there are nests on the pipes. Whose nests do you think those are?*
D: М, птиц.
D: *M, birds.*
M: А каких птиц?
M: *And what kind of birds?*
D: страусов.
D: *Ostriches.*
M: аистов, да?
M: *Storks, right?*
D: аистов.
D: *Storks.*
M: Аисты себе вьют вот такие большие гнезда. Они почему-то любят их вить как раз на трубах.
M: *Storks build such big nests for themselves. For some reason, they like to build them on pipes.*
D: ого.
D: *Wow.*
M: угу.
M: *Yep.*
D: М ам, знаешь кем я буду?
D: *M, do you know what I'll be?*
M: как ты думаешь, это город или деревня, что это такое?
M: *What do you think, is it a city or a village, what is it?*
D: это деревня.
D: *It's a village.*
M: почему ты так решила?
M: *Why did you decide that?*
D: А, это город.
D: *Oh, it's a city.*
M: Ну расскажи, почему?
M: *Well, tell me why?*
D: ну потому что.
D: *Well, because.*
M: Ну почему? Какие тут дома?

M: *Well, why? What kind of houses are here?*
D: Деревянные.
D: *Wooden.*
M: деревянные? Низкие, да?
M: *Wooden? Low, right?*
D: низкие.
D: *Low.*
M: дома низкие, точно. Кто здесь изображен на картинке? Кто такие?
M: *The houses are low, that's right. Who is depicted in the picture? Who are they?*
D: Олени.
D: *Deers.*
M: Олени, точно. А где они находятся?
M: *Deers, right. And where are they located?*
D: в лесу
D: *In the forest.*
M: Что же они хотят сделать?
M: *What do they want to do?*
D: убежать
D: *To run away.*
M: убежать?
M: *Run away?*
D: да
D: *Yes.*
M: думаешь убежать?
M: *Do you think they want to run away?*
D: да
D: *Yes.*
M: почему?
M: *Why?*
D: потому что за ними гонится волк
D: *Because a wolf is chasing them.*
M: Ммм. А посмотри, что здесь нарисовано?
M: *Hmm. And look, what is drawn here?*
D: Река
D: *A river.*
M: Река? Маленькое озеро, да?
M: *A river? A small lake, right?*
D: да
D: *Yes.*
M: +<может они к озеру идут?
M: *Maybe they are heading towards the lake?*
D: да, может они к озеру идут
D: *Yes, maybe they are heading towards the lake.*
M: потому что, мне кажется, что они не бегут. Они спокойные. Один олень повернулся к другому.
M: *Because, it seems to me that they are not running. They are calm. One deer turned towards another.*
D: Это мама-олениха.
D: *That's a mother deer.*
M: +<олениха, да? Мне кажется, она его зовет к озеру попить воды.
M: *+<Deer mom, right? I think she's calling him to the lake to drink water.*
D: Какой еще воды?
D: *What kind of water?*
M: Вкусной воды.
M: *Delicious water.*
D: она +/. И из них они могут превратиться, знаешь, в кого?

D: *She +/- And do you know what they can transform into?*
M: **В КОГО?**
M: *Into what?*
D: **в страуса.**
D: *Into an ostrich.*
M: **олени?**
M: *Deers?*
D: **да (laughing)**
D: *Yes (laughing)*
M: **(laughing) напившись воды, да?**
M: *(laughing) after drinking water, right?*
D: **да**
D: *Yes*
M: **хорошо**
M: *Okay*
M: **Так, на этой картинке нарисована кто?**
M: *So, who is drawn in this picture?*
D: **белочка.**
D: *A squirrel.*
M: **А что она делает, белочка?**
M: *What is the squirrel doing?*
D: **Она хочет залезть на свой дуб, в котором есть гнездышко, и она тащит орешки.**
D: *She wants to climb onto her oak tree, where there is a nest, and she's dragging acorns.*
M: **Да. Откуда она орешек сорвала?**
M: *Yes. Where did she pick the acorn from?*
D: **из дерева такого.**
D: *From a tree like this one.*
M: **с кустика.**
M: *From a bush.*
D: **с кустика.**
D: *From a bush.*
M: **с орехового кустика, да?**
M: *From a hazelnut bush, right?*
D: **да.**
D: *Yes.*
M: **+<a как домик у белочки называется?**
M: *+And what is the house of the squirrel called?*
D: **дуб.**
D: *Oak tree.*
M: **дупло.**
M: *Hollow.*
D: **дупло.**
D: *Hollow.*
M: **вот правильно, молодец.**
M: *That's right, well done.*

List of Figures

1	Motion events Terminology (Soroli et al., 2019)	15
2	Research on holistic and phasal perspectives: the motion events terminology.	16
3	Stimuli from Flecken, Carroll, et al. (2015)	24
4	Example of stimuli made by the Heidelberg group. The figure is taken from Athanasopoulos et al., 2015.	27
5	Example of a stimuli used in Kaefer et al. (2017). It is a page from a book <i>Tom and Pippo and the Bicycle</i> (Oxenbury, 1997).	28
6	Example of a picture from the book <i>Frog, where are you?</i> Mayer, 1987.	29
7	Example of the original stimulus.	30

List of Tables

1	Overview of terminology and concepts.	9
2	The list of critical stimuli used in Flecken et al. (2014).	27
3	Methodological overview of studies investigating conceptualization of motion and change-of-state events, with emphasis on endpoint/result differences.	35