Do L2 speakers think in the L1 when speaking in the L2?

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Abstract

The article presents the results of an elicitation study, including linguistic, eye-tracking and memory data, with 22 advanced Czech and 22 advanced Russian L2 speakers of German, as well as 22 native speakers of German producing verbalizations of a set of short video clips. It investigates the role of grammatical forms in the construal of goal-oriented motion events. All three measures--verbalization, allocation of attention, and memory--point in the same direction: although advanced L2 speakers are successful in learning the necessary forms and their appropriate functions, they seem not to succeed in mapping these forms onto the principles required for the construal of events in the target language. This suggests that even for highly proficient L2 speakers, conceptual restructuring into the direction of the L2 is limited.

Keywords: adult second language acquisition**,** conceptualization, motion events, eye-tracking, advanced L2 speakers

Zusammenfassung

Dieser Artikel stellt Ergebnisse einer Elizitationsstudie vor, die neben linguistischen Daten auch Messungen der Augenbewegungen und Gedächtnisleistung umfasst. Die Teilnehmer waren je 22 fortgeschrittene tschechische und russische L2-Sprecher des Deutschen sowie 22 deutsche Muttersprachler. Ihre Aufgabe war es, kurze Videoclips zu versprachlichen. Die Studie untersucht die Rolle grammatischer Formen bei der Konzeptualisierung von zielorientierten Bewegungsereignissen. All drei Maße--Verbalisierungen, Aufmerksamkeitsmuster und Gedächtnisleistungen--belegen folgendes Ergebnis: Obwohl fortgeschrittene L2-Sprecher grammatisch relevante Formen und ihre jeweiligen Funktionen in der L2 erfolgreich erworben haben, scheinen sie diese Formen nicht auf die der Konzeptualisierung von Bewegungsereignissen zugrunde liegenden Prinzipien anwenden zu können. Diese Resultate deuten darauf hin, dass eine konzeptuelle Restrukturierung in Richtung der Zielsprache auch für sehr kompetente L2-Sprecher nur bedingt möglich ist.

Stichwörter: Zweitspracherwerb bei Erwachsenen, Konzeptualisierung, Bewegungsereignisse, Eye-tracking (Messung der Augenbewegungen), fortgeschrittene L2 Sprecher

1. Introduction

Learning a foreign (or a second – L2) language at school is compulsory for the majority of Europeans, yet the level of proficiency which one can reach in a foreign language depends on many different factors and varies greatly from one individual to another. Nonetheless, to have a very good command of a foreign language (or languages) is advantageous in many ways. From a social point of view, good knowledge of a foreign language is regarded as a sign of sophistication, good education, and even intelligence. As far as communication is concerned, highly fluent L2 speakers are able to express their thoughts or emotions with eloquence and precision which, in turn, enables them to present themselves well and, if necessary, to defend their own interests. In Europe alone, about 31 million individuals do not live in their home country; for them, mastery of the respective second language is not only desirable, but also frequently a prerequisite for social acceptance and/or professional success in the country of choice.

One of the most intriguing questions, which comes to mind in this context, is *What does it take for an adult learner to gain a good command of a foreign language?* Most studies so far have been concerned with factors, which are assumed to shape the learning process of the L2 and to affect its outcome (the final state). Examples of such factors are language talent and aptitude, age of acquisition, age of arrival or length of residence in the foreign country. So far no consensus has been reached as to which of these factors determines how well and to what extent a person can learn a second language. But even if future research will identify more such factors we will still know very little about the dynamics of the underlying psycholinguistic processes. In other words, the age of acquisition, for example, may serve as a predictor for the degree of command of the L2, e.g., the younger the learner, the better the command, but it does not explain the underlying processes, which must take place in the learner's brain in order to achieve mastery in the second language.

The understanding of the 'cognitive profile' of very advanced adult learners would significantly increase our understanding of learning and the factors that shape this process. We can enhance our understanding of these conditions, usually described, somewhat vaguely, as language talent or aptitude, if we employ a combination of linguistic tasks and non-linguistic tasks with modern research methods. The present study employs such a combination of elicitation, memory and eye-tracking techniques

to investigate language production of highly successful L2 speakers. The domain of analysis is conceptual knowledge, specifically the conceptualization of goal-oriented motion events. Conceptual knowledge of any kind is the most complex domain to be acquired in a second language and it presumes a nearly perfect command of the L2 grammar. Moreover, this type of knowledge usually does not follow patterns of formal but rather distributional accuracy, i.e. conceptual knowledge is a matter of preferences, which, unlike grammatical features such as gender assignment, do not mutually exclude each other but rather coexist in one and the same system. This is certainly one of the reasons why conceptual preferences pose a long lasting learning challenge for adult learners. Nevertheless, command of conceptual knowledge is a part of perfect mastery of a second language and makes it possible of a L2 speaker to "think" like a native speaker (if one wishes to).

At this juncture, several points must be addressed: (1) what methods can be employed when studying the 'cognitive profile' of near-native L2 speakers, (2) what L2 population should the in focus, and (3) what psycholinguistic processes should be discussed?

As to the first point (1): The method employed in the present study is eye-tracking (ET). Eye movements before and while speaking are considered to reflect speech planning processes (e.g., Griffin and Bock, 2000, Griffin, 2004, Levelt, Roelofs, and Meyer, 2002), and it is assumed that eye movements during event conceptualization provide a window on underlying event representations and their link to linguistic means (Papafragou, Hulbert, and Trueswell, 2008; Schmiedtová, v. Stutterheim, and Carroll, in press, v. Stutterheim, Bastin, Carroll, Flecken, and Schmiedtová, forthcoming). Hemodynamic (e.g., fMRT) and/or electrophysiological methods (e.g., EEG) would in principle be also suitable for the investigation of the cognitive underpinnings of highly successful second language learners. However, the experimental design and the technical limitations, which are inherent to these methods, require the simplification of the underlying research question. Because of this, complex linguistic structures examined in a cross-linguistic comparison are rarely topics addressed in neuroimaging studies (cf. Kotz, 2009). Additionally, neuroimaging and electrophysiological research has been mainly focused on comprehension rather than on production of language. The second point (2) concerns the type of L2 population. The present study focuses on L2 learners who have started acquiring L2 German as a foreign language in their home country after the age of 10 and were at the time of the experiment living in Germany for at least five years. This means that this study is concerned with second language rather than bilingual acquisition, and investigates adult L2 speakers who were initially tutored learners of the L2 German. In this paper I adhere to de Houwer's definition of a bilingual speaker (2009: 14): "a speaker who has been exposed regularly to two languages from birth, which made

the speaker growing up in a bilingual first language acquisition situation".

The focus of the investigation is on three languages: German, the target language, does not express aspect grammatically and thereby differs crucially from the two source languages, Czech and Russian.

As for the last point (3), two processes are particularly relevant here: *restructuring* and *automatization*. These processes, which are closely interconnected and dependent on each other, are prerequisite for mastery of a foreign language: automatized access to knowledge leads to fast and effortless (=near-native) production and comprehension of a second language; successful restructuring of internalized conceptual representations yields native-like performance in all domains of the second language. The focus of the present study is on *restructuring*, in particular on the question whether and to what degree restructuring of conceptual knowledge in the direction of the L2 is possible. By employing the eye-tracking method, this study provides new insights in the debate addressing ultimate attainment in highly successful L2 users.

The article is structured as follows: section 2 provides as short overview of the theoretical framework; section 3 summarizes previous research on restructuring and automatization in second language acquisition as well of event construal by L2 users; section 4 introduces the methodology used in the present study; section 5 presents the findings of this study; section 6 is dedicated to the discussion of the present findings. We end with some preliminary conclusions.

2. Theoretical framework

2.1 Organizing information for verbalization: conceptualization

In line with Levelt's model of language production (1989) I assume that the process of conceptualization takes place in the *conceptualizer*, the first out of three main components of the model. In the conceptualizer, the so-called 'preverbal message' is generated and then passed on to the *formulator*, in which the contents of the preverbal message are mapped onto the linguistic form by adding lexical, syntactic, and phonological information. In the final step, the output of the formulator is sent to the last component of the model, the *articulator*; here the material is prepared for the actual articulation. Levelt's model is very useful for modeling language production in general, and it provides a detailed theory about the processes taking place in the formulator. According to Levelt, two central processes are involved in the conceptualizer, *macroplanning* and *microplanning*.

A more detailed theory of conceptualization was proposed by v. Stutterheim and Nüse (2003). In their view, conceptualization involves four processes, which are required for organization of information prior to verbalization (cf. Habel and Tappe, 1999). These processes are: segmentation, selection, structuring, and linearization. In the first process, *segmentation*, specific units must be selected from a general knowledge base that is non-hierarchical with respect to a given topic. For example, complex dynamic situations may be segmented into smaller components, i.e. events, processes, or states. In the next process, *selection*, the speaker makes a selection of those elements that will be verbalized in combination with the components (e.g., entities, spaces, times) by which these elements can be represented. In Levelt's (1989) view, the processes of segmentation and selection constitute macroplanning.

The next process is *structuring*. The elements selected by the speaker in the previous step must be structured in accordance with the type of predicate, its argument structure and thematic roles (e.g., 'give' versus 'receive') as well as with the type of a particular referential frame (e.g., spatial and temporal anchoring) and information status (e.g., topic and focus assignment). In the process of structuring, the speaker must also choose the perspective under which he intends to speak about the given situation. In case of event construal, for example, the speaker has to decide whether to view the event as ongoing or as completed (cf. Schmiedtová et al., in press; v. Stutterheim and Nüse, 2003). The last process involved in conceptualization is *linearization*, where the speaker orders words in such a manner that they can be verbalized as a linguistic sequence. According to Levelt's (1989), the processes of structuring and linearization are part of microplanning.

2.2 Grammaticalized concepts

Previous studies have shown (cf. Nüse, 2003; v. Stutterheim and Klein, 2003; v. Stutterheim et al., forthcoming) that processes involved in structuring are perspective-driven. In other words, when preparing expression for verbalization, speakers seem to structure information under a specific temporal perspective that is closely tied to abstract concepts encoded by various grammatical means available in a particular language system. In the present approach, grammar is regarded as a system of meanings that has gained prominence in a given language through the process of grammaticalization (cf. Bybee, Perkins, and Pagliuca, 1994; Talmy, 1988). I assume that when speakers are preparing content for speaking they attend more to those linguistic categories that are grammaticalized in a given linguistic system. This is because the expression of these categories is obligatory in relevant contexts, which from a processing point of view, makes these categories highly accessibly and automatized and more preferred when a given language is in use.

In this article I focus on the role of grammaticalized aspectual categories for information organization before verbalization. Examples of concepts linked to the notion of aspect are 'ongoingness', 'perfectivity', or 'iterativity'. To avoid confusion, I use the term aspect to refer to grammatical aspect (for more discussion on this topic, see Klein, 1994; Schmiedtová and Sahonenko, 2008; v. Stutterheim, Carroll, and Klein, 2009).

As previous studies discussed below demonstrate, speakers of aspectual languages in which aspect is expressed obligatory by means of verbal morphology (e.g., English, Modern Standard Arabic, or Russian) are guided to conceptualize and express corresponding parts of motion events and differ from speakers of non-aspectual languages (e.g., German, Norwegian) who focus systematically on different parts of the same event. In this sense, conceptual preferences employed by speakers for structuring information emerge. These preferences are dependent on the presence or absence of a particular grammaticalized linguistic form (e.g., aspect) which encode a particular concept (e.g., ongoingness) in a given language.

2.3 Theory of event construal

Following Carroll, v. Stutterheim, and Nüse (2004) I assume that the construal of events is guided by language-specific structures which are driven in part by what is considered in a particular language as a *reportable event*. Previous studies have shown that language-specific structures affect the representation and conceptualization of events. Many studies have focused on language-specific patterns in the construal of motion events (e.g., Bohnemeyer, Enfield, Essegbey, Ibarretxe-Antunano, Kita, Lüpke, and Ameka, 2007; Gumperz and Levinson, 1996; Kopecka, 2008; Slobin, 2000; Talmy 1988, 2000). Another line of research has examined the influence of language specificity on event separation such as *to cut or break something* (e.g., Majid, Boster, and Bowerman, 2008; Majid, Gullberg, van Staden, and Bowerman, 2007), on event serialization (e.g., Talmy, 2000), and on sequencing sets of events in larger pieces of discourse (e.g., Carroll, Rossdeutscher, Lambert, and v. Stutterheim, 2008; Carroll and v. Stutterheim, in press; v. Stutterheim, Carroll, and Klein, 2003).

The focus of the present article is on the construal of goal-oriented motion events which involve the motion of an animate or inanimate entity towards an endpoint. In these types of events, speakers have the choice to either view the situation holistically by including the endpoint of the motion, or they can choose to select other parts of the motion event by focusing on the beginning, intermediate, or the final phase of the event. A large amount of linguistic studies have provided evidence that speakers' preference for one of the two perspectives is not random but rather closely tied to the

presence or absence of grammatical aspect expressing the concept of ongoingness in the linguistic system of a particular language.

In particular, a study by v. Stutterheim et al. (under review) based on linguistic, eye-tracking, and memory data has demonstrated that native speakers of aspectual languages (e.g., English, Russian, Spanish) allocate visual attention differently from native speakers of non-aspectual languages (e.g., Dutch, German). For example, German native speakers' eyes remained much longer in the critical region (the endpoint) and came back to it more often than Russian native speakers. The differences in eye-movements were further corroborated by the ability to remember: Native speakers of German had a notably better memory for endpoints in critical scenes than native speakers of Russian had for the same type of scene. Overall, speakers of different languages accessed and used different conceptualizations of one and the same situation. These differences in conceptual knowledge led to differences in eye-movements, verbalizations and memory. Another important finding of this study was that native speakers of Czech and Russian--despite the typological closeness of their mother tongues--construed goal-oriented motion events following different conceptualization patterns. We will outline this latter point which is vital for the interpretation of the findings from the present study in Section 4.2.

3. Previous studies

3.1 Automatization in second language acquisition (SLA)

Only a very few studies have focused on automatization in a second language. Favreau and Segalowitz (1983) were the first to demonstrate its importance for understanding L2 proficiency. The authors showed that reading pace and single-word recognition is faster (=more automatized) in advanced than in less advanced L2 speakers. Another study on reading skills in L2 speakers (McLeod and McLaughlin, 1986) provided evidence of the same kind. A later set of studies (Segalowitz, Poulsen, and Segalowitz, 1999; Segalowitz and Segalowitz, 1993; Segalowitz, Segalowitz, and Wood, 1998) addressed a very important methodological and theoretical issue concerning the difference between a genuine automatization of underlying processes and a more general speed-up in the processing of an L2. It was shown that automatized processing does not always equal fast processing. Apart from these few empirical studies, there have been some attempts to integrate the concept of automatization into the theories of L2 proficiency and L2 grammar learning. For example, Pienemann (1998) proposed a processability theory of how automatized skills develop in the L2 learner. Works by Ellis (2000), Hulstijn (2002), and Paradis

(1994) discuss the different theoretical positions related to the transformation of explicit (controlled) into implicit (automatized) knowledge by practice. However interesting this theoretical discussion may be, little empirical research has been done to verify the theoretical claims. Additionally, all theoretical discussions in SLA considering the notion of automatization have focused on the learning process of a second language; no study has explored, theoretically or empirically, the final state, i.e. the native-like command of an L2.

Another line of research, which may come to mind in this context, is the study of bilingual speakers. Bilinguals are different from adult second language learners because they have acquired two languages already in childhood. But since there is no general agreement on how to define a bilingual speaker and thus differentiate bilinguals from second language learners, highly proficient L2 speakers are often labeled as bilinguals. This is the reason why I relate to the main findings from this research area. The main research question in bilingualism has been whether the scope of automaticity in an L2 is the same as in the L1 (mother tongue). The consensus in the field seems to be that due to differences in processing and brain structure, balanced bilinguals only exceptionally achieve the same high degree of automaticity comparable to that of monolingual speakers (cf. Foursha, Austin, and van de Walle, 2006; Mägiste, 1982; Marian, Spivey, and Hirsch, 2003). It is, however, important to stress that the majority of these studies tested automatization in experiments involving switching between two languages in one and the same task. This approach is in my opinion problematic, because it assesses bilinguals' ability to activate one and inhibit the other language simultaneously, but it does not necessarily reflect the degree of automatization achieved in each language. I am aware of the complexity and methodological difficulty raised by my concern; it is nevertheless a valid point in the discussion of automaticity in bilinguals.

To sum up, although there seems to be a general consensus that automaticity is essential for the process of learning and the acquisition of complex cognitive skills, the existent SLA research is not up-to-date and limited to only a small number of studies. Although the bilingualism literature has addressed the issue of automatization, the main focus has been on automatized processes involved in the switching between two languages. The present study enriches the SLA literature in three respects: (1) it investigated automatized processes recruited for the access to conceptual knowledge; (2) it focuses only on the second language; (3) it examines a homogeneous group of L2 speakers who have achieved a native-like command of the L2.

3.1 Restructuring in second language acquisition

In the SLA research, restructuring has been to some extent investigated for the development of grammar, syntax, and semantics at initial and intermediate stages of acquisition. For example, discontinuities in L2 syntactic development are indicative of restructuring (Wode, Bahns, Bedey, and Frank, 1978). It is also generally accepted that new forms are not simply added on, but cause restructuring of the entire system (Kellerman, 1985; Lightbown, 1985). In addition to the development of grammar, some older research investigated the development of reading skills. It was shown that beginning and advanced second language readers use different strategies for reading in an L2. These were linked to differences in the scope of restructuring (cf. Johnston, 1972; Cziko, 1980; McLeod and McLaughlin, 1986).

With respect to advanced stages of L2 learning, the focus in the field has been on the issue of ultimate attainment rather than on restructuring itself. In addition, restructuring has been more of an issue in bilingualism research. The available evidence is limited, mixed, and tricky: Some studies have found (partial) shifting of conceptual knowledge in the direction of the L2 for the domains of color (Athanasopoulos, 2009) and object naming and categorization (Athanasopoulos, 2006, 2007; Athanasopoulos and Kasai, 2008; Cook et al., 2006; Malt and Sloman, 2003), and talk and gesturing about situations and motion (Brown and Gullberg, 2008; Cadierno, 2004; Cadierno and Ruiz, 2006; Hohenstein, Eisenberg, and Naigles, 2006; v. Stutterheim and Carroll, 2006; Wolff and Ventura, 2009). Other studies have shown that conceptual knowledge required for text organization and the expression of time is not attainable for highly proficient learners in the L2 (Carroll and Lambert, 2006; Carroll and v. Stutterheim, 2003; Schmiedtová, 2004; Schmiedtová and Sahonenko, 2008). Another important notion in this context is *conceptual transfer*. Pavlenko was the first who has begun to systematically investigate this phenomenon (see Pavlenko, 1996, 1997, 1999; for elaborations see Pavlenko, 2002, 2005).

Common to all these studies mentioned above are methodological limitations. They tested highly proficient learners on different linguistic and non-linguistic tasks involving different degrees of complexity and found that some of them did and others did not reach mastery in the L2. In addition, several of these studies examined other factors such as length of residence, language dominance, and age of acquisition and correlated them with the achieved level of proficiency in the L2. However, because of the lack of a suitable method, none of the studies was in a position to examine the actual processes leading to native-like performance in the L2.

To summarize, there is no doubt that the process of restructuring is essential for L2 learning. Although the success in restructuring, or the lack thereof, is often used

to account for differences found in L2 proficiency, or between learners and native speakers, very few SLA studies so far have investigated the dynamics of the process itself. The evidence from the research on conceptual restructuring in bilingual speakers is limited to a small number of studies and is inconsistent as to the extent of restructuring attainable in one of the languages. It is, however, evident that successful learners who have achieved native-like competence in a L2 must have restructured their knowledge and automatized the use of the second language. Note, however, that restructuring does not imply a complete replacement of structures from the first language by structures of the second. But interestingly, it has been shown that the second language can have an effect on the first (cf. Cook, 2003). The use of the eye-tracking method in the present study for the investigation of complex linguistic structures certainly provides new insights into the current debate on the scope of restructuring in the SLA literature.

4. Method

4.1 Research assumptions and research question

Based on previous research, the underlying assumption of my study is that conceptual preferences recruited by speakers for information organization and event construal are deeply rooted in the grammatical system of the source language. Grammars of different languages express a limited set of meanings, which form the basic grid for conceptual organization within the cognitive domain of language. From the L2 user's point of view, the complexity of this type of linguistic knowledge poses a substantial challenge for the learning process of the L2, respectively on the scope of restructuring of the L1 towards the L2 patterns. My central research question is whether highly successful L2 speakers can learn to conceptualize goal-oriented motion events in accordance with the preferences of motion construal used by native speakers of the target language.

I begin by discussing how different languages construe goal-oriented motion, more specifically, how they differ in this respect and what grammatical concepts trigger these differences. Relating to some recent studies, I will also briefly explain the actual preferences native speakers of German, Czech, and Russian recruit when construing goal-oriented motion events.

4.2 Languages studied and preferences of L1 speakers

Two source languages and one target language are examined in the present study. The source languages are two Slavic languages, Czech and Russian, and the target language is German. In what follows I will outline how the presence or absence of the grammatical aspect in a given linguistic system interacts with attention to a possible endpoint and then explain what preferences native speakers of these languages have when they speak about goal-oriented motion. It is important to say in advance that a linguistic description provides a comprehensive overview of linguistic possibilities available for expression in a language system but does not need to mirror the actual language use reflected in preferences selected by native speakers when producing language.

We will begin with the standard description of the investigated languages in terms of the relevant aspectual categories that is depicted in Table 1 (cf. Dahl, 1985).

Table1. Aspect systems of German, Czech and Russian

	German	Czech	Russian
1. Imperfective	No	Yes	yes
2. Progressive	No	No	no
3. Secondary imperfective	No	Yes	yes
4. Perfective	No	Yes	yes

The first three aspects*--imperfective*, *progressive*, *secondary imperfective--*can be employed for the expression the *ongoingness* of a situation. It is important to stress here that the three "ongoing aspects" do not encode this viewpoint in the same way (for a more detailed discussion of this topic, see Schmiedtová and Flecken, 2008; Schmiedtová and Sahonenko, 2008; v. Stutterheim, Carroll, and Klein, 2009. The fourth aspect in Table 1 is the *perfective* which denotes the *completion* of a situation. All four aspectual categories are grammatical.

The first obvious difference is that German, in contrast to Czech and Russian, does not express aspect grammatically. In other words, linguistic means for the expression of ongoingness or completion are not grammaticalized in German. In some German regions though, ongoingness can be expressed by the constructions *bei/am* + verbal noun, as in *Eine Frau ist am Stricken* - 'A woman is knitting (at-

the knitting)' - or *Ein Surfer* (*is*) *beim Wellenreiten* 'A surfer is surfing (by-the waves riding)'. Another construction used to this purpose is *dabei* (there-at) + *sein* (to be) + INF as in *Jemand ist dabei ein Papierflugzeug zu falten* - 'Someone is folding a paper airplane'. Although these constructions do exist in the grammars of some varieties of German, they are hardly ever produced by native speakers of such a variety, or by native speakers of standard German, in spontaneous or elicited language production (cf. Flecken, 2010; Schmiedtová, 2004; Schmiedtová and Flecken, 2008).

When German native speakers construe goal-oriented motion events they show a strong preference--on average more than 70% of all participants in every sample tested--to include a possible endpoint and thus to view the situation under a *holistic* perspective (cf. Carroll and v. Stutterheim, 2003; Schmiedtová, et al., in press; v. Stutterheim et al., forthcoming). These findings are further corroborated by the results from studies on other non-aspectual languages, such as Dutch (Flecken, in press); Norwegian (v. Stutterheim and Carroll, 2006), and Swedish (Bylund, 2008, 2009). One reason to apply the holistic perspective is the necessity of supplying anchorings in clarifying the status of the event with respect to specificity and time of assertion (Carroll, v. Stutterheim, and Nüse, 2004). A typical verbalization found in the actual language production data of German native speakers is given in example (1). The situation to be verbalized is the following: two persons are walking on a road, in the distance is a building; the persons do not reach this building.

(1)

Zwei Frauen	*gehen*	*zu einem Haus*
Two women (NOM)	walk	to a house (DAT)

Two women are walking to a house

Turning to Czech and Russian, it should be stressed that in comparison to another aspectual language such as English, every verb must be assigned a particular aspect. This holds also true for the infinitive forms, e.g., the Czech infinitive *koupi-t* - 'to buy' is a perfective while the infinitive *psá-t* - 'to write' - is an imperfective. The same is true for Russian. It has been not clarified in the literature yet whether this distinction is of semantic or grammatical nature.

That is, whenever a verb is used the speaker must choose between a perfective and an imperfective, so there is no "aspect-neutral" or "aspect-free" form in Czech and Russian, or, in fact, in any other Slavic language. When denoting *ongoingness*, Czech and Russian native speakers can in principle choose between two different aspectual forms--the *simplex* and the *secondary imperfective*. It should be noted that the simplex and the secondary imperfective forms in Czech and Russian do not express viewpoint in the same manner. In addition, the mapping of function onto form differs

between Czech and Russian. Overall, the simplex form seems to be multifunctional by denoting habituality, progressivity or genericity, while the secondary imperfective expresses imperfectivity or sometimes iterativity. Since for the expression of goal-oriented motion events, the topic of this paper, speakers of both languages mainly employ simplex imperfectives rather than secondary imperfectives, I will refrain from a further discussion of the secondary imperfective and focus on the simplex form instead.

For the expression of *completion* the *perfective* aspect is employed which is shown in example (2) from Czech and example (3) from Russian. The situation depicted in these examples is a goal-oriented motion in which a person is walking towards a building with a prominent door and the person reaches the door. (In (2) and (3) note the difference in cases in the adjunct 'into a door' (Czech uses the genitive, Russian, the accusative). They are due to the different prepositions used in these two languages: Czech makes use of *do* 'in' and Russian uses *v* 'in.')

(2)
Někdo *ve-jde* *do dveří*
Somebody (NOM) enter.Perf.Prs.3.SG in door (GEN)
Somebody enters/comes in through the door

(3)
Kto-to *v-chodit* *v dveri*
Somebody (NOM) enter.Perf.Prs.3.SG in door (ACC)
Somebody enters/comes in through the door

When the perfective aspect is used in goal-oriented motion events, the mentioning of endpoints in an adjunct is obligatory in both languages. (An exception for the use of the perfective aspect without any additional arguments would be a sequence of multiple events, e.g., *Pán vejde, napije se a odejde* - 'A man walks in, drinks, and leaves'. This is also the case for Russian.) The use of the perfective aspect in goal-oriented motion events can be seen for Czech in example (4) and for Russian in example (5).

(4)
Někdo *ve-jde (?)*
Somebody (NOM) enter.Perf.Prs.3.SG
Somebody enters/comes in

(5)
Kto-to *v-chodit (?)*
Somebody (NOM) enter.Perf.Prs.3.SG
Somebody enters/comes in

Both utterances can occur in past tense, as in example (6) for Czech, and example (7) for Russian. The mentioning of the endpoint as well as the argument structure of the utterance, remain unchanged.

(6)
Někdo *ve-šel* *do dveří*
Somebody (NOM) enter.Perf.Past.3.SG in door (GEN)
Somebody entered/came in through the door

(7)
Kto-to *vo-she-l* *v dveri*
Somebody (NOM) enter.Perf.Past.3.SG in door (ACC)
Somebody entered/came in through the door

Now let us attend to the *simplex imperfective* which is available for the expression of ongoing situations in both the Czech and Russian aspectual systems. This form is morphologically unmarked and inherently imperfective. There is also a small but frequently used group of simplex *perfective* verbs (for a more detailed discussion on these verbs, for Czech see Schmiedtová (2004, 2010); for Czech and Russian or only Russian, see Schmiedtová and Sahonenko, 2008).

Czech and Russian seem to function differently when it comes to using this form for the verbalization of goal-oriented motion events. In Russian the simplex imperfective is allowed to occur as a bare phrase without any additional arguments, as in example (8). In Czech, however, the simplex imperfective must be accompanied by another argument or arguments which provide some kind of grounding information. The additional argument(s) does not need to refer to a possible endpoint but can encode other information such as manner or path, as in example (9). Addition of arguments is also possible for Russian. The use of a bare phrase, however, is not grammatical in Czech, as seen in example (10).

(8)
Mašina *jed'et*
Car (NOM) ride.Imperf.Prs.3.SG
A car is riding

(9)
Auto *jede* *pomalu / po silnici / do vesnice*
Car (NOM) ride.Impf.Prs.3.SG slowly / on road.DAT.LOC/
in village.ACC.LOC
A car is riding slowly / on the road / into the village

(10)

**Auto jede*
Car (NOM) ride.Imperf.Prs.3.SG
A car is riding

When it comes to the encoding of a possible endpoint in an actual production task, previous findings have shown that Czech and Russian native speakers differ in terms of the perspective selected for construing goal-oriented motion events (Schmiedtová and Sahonenko, 2008; v. Stutterheim et al., forthcoming). While Russian native speakers showed a preference for presenting this event type as ongoing, native speakers of Czech preferred the holistic perspective by including a possible endpoint when verbalizing the same type of event. The findings based on linguistic data are further supported by memory and eye-tracking data (v. Stutterheim et al., forthcoming).

As previously mentioned, Czech and Russian use mainly simplex imperfective forms for the depiction of goal-oriented motion events. So in order to understand the role of aspect for event conceptualization we have to turn to another event type for which all three aspects available in Czech and Russian can be used. Schmiedtová and Sahonenko (2008) examined events depicting scenes with a qualitative resultant state, such as *Someone is posting a letter* (with the letter being posted at the end of the clip) or *Someone is drinking up a glass of water* (with the drinking of water being finished at the end of the clip), in 30 Czech and 30 Russian native speakers. It was found that 57% of Czech speakers used the perfective aspect, and thus viewed the situation holistically (only 9% of Russian speakers employed the perfective). By contrast, 59% of Russian native speakers made use of the secondary imperfective, and so depicted the situation as ongoing (only 4% of Czech speakers did so). No differences were found for the use of the simplex imperfective which was employed by about 35% of native speakers from both languages (Schmiedtová and Sahonenko, 2008: 59 ff.).

To sum up, the three languages examined in this study differ with respect to the presence and absence of grammatical aspect. While German does not denote aspectual relations grammatically, Czech and Russian do. The lack of the grammatical aspect interacts in German with the attendance to a possible endpoint insofar that native speakers of German show a strong tendency to take a holistic perspective on goal-oriented motion events, while Czech and Russian native speakers do not, even when using German at a highly proficient level.

Czech and Russian share a similar aspectual system which comprises two imperfective forms for the expression of ongoingness, of which only the simplex imperfective is used for goal-oriented motion events, and one perfective form for the

expression of completion. This means that native speakers of Czech and Russian have in principle the option to construe goal-oriented motion events under two perspectives: (a) the holistic perspective by using either the perfective aspect with the obligatory mentioning of a possible endpoint, or the simplex imperfective in combination with an local adjunct referring to a possible endpoint; (b) the ongoing perspective by using the simplex imperfective either as a bare phrase (in Russian) or in combination with an argument relating to another piece of information than a possible endpoint. The latter is possible in Czech as well as in Russian.

Findings based on empirical research have shown that native speakers of Czech prefer the holistic perspective on goal-oriented motion while native speakers of Russian view this event type as ongoing. So, although Czech and Russian, but not German, encode aspect grammatically, German and Czech cluster together because of their preference for the holistic over the ongoing perspective for the construe of goal-oriented motion events. I will discuss the differences in the aspect use in Czech and Russian, and also the possible reasons for their emergence, in more detail in Section 6.

4.3 Participants

Three participant groups were examined in this study: one L1 group--used as a control group-- consisted of 21 German native speakers (10 female, 11 male), and two L2 groups-- 21 Czech learners of German (18 female, 3 male) and 21 Russian learners of German (20 female, 1 male). The data of 20 German native speakers used in the present study were taken from a previous study (cf. v. Stutterheim et al., forthcoming); for the sake of a balanced comparison, one German participant was added to the sample. The average age of German native speakers was 25.4 (age range: 20-35 years). All participants in the control group were either undergraduate or graduate students at the University of Heidelberg, and grew up with German as the only language which they were exposed to at least until schooling age (usually the age of 5 or 6). At the time of the experiment, all German participants had knowledge of at least one foreign language, mostly English and/or French.

The L2 speakers were students at the University of Heidelberg, or in some cases, professionals, i.e., German translators and/or interpreters or teachers of German as a foreign language. The average age of Czech learners of German was 29.9 (age range: 20-59 years); the average age of Russian learners of German was 27.3 (age range: 22-38 years). All but one of the L1 Czech and two of the L1 Russian speakers of L2 German had at the time of the experiment knowledge of at least one other foreign language, mostly English.

Language proficiency in L2 German was not tested by a separate language test, but rather assessed on the basis of several criteria linked to linguistic and extra-linguistic parameters. (It should be stressed that to enroll at a German university all foreign students have to pass the so-called "Deutsche Sprachprüfung für den Hochschulzugang ausländischer Studienbewerber (DSH)", which is a standardized language test, including an extensive written and a spoken language test.) These parameters were:

(1) Formal accuracy was evaluated for in nominal and verbal morphology, syntax (especially agreement, inversion and word order in main and subordinate clauses) and lexical repertoire. For all these measures, comparisons were drawn between L2 speakers and native speakers of German in the same task. L2 speakers who produced errors in these linguistic areas were excluded from the L2 sample. In the end, two Czech and three Russian L2 learners of German were excluded from the sample. (2) All L2 speakers who participated in this study spoke German on a daily basis, which was assessed in a self-assessment questionnaire. According to the self-assessment data, about 80% of Czech learners of German and 95% of Russian learners of German considered German as their dominant language. (3) L2 speakers were selected for this study only if their length of exposure to German--defined as a combination of the length of residence in the L2 environment and the length of L2 instruction--was longer than 6 years (Czech learners of German: on average 13.9 years, *SD*=8.1; Russian learners of German: on average 10 years, *SD*=3.5). The average length of residence in Germany was for Czech learners of German was 7 years (*SD*=8.5) and for Russian learners of German it was 5.5 years (*SD*=2.3).

All L1 and L2 participants had normal or adjusted vision. The same participants took part in the language production experiment, which comprised recordings of audio as well as eye-tracking data, and in the subsequent memory task. The data collection was carried out in the eye-tracking laboratory at the Institute of General and Applied Linguistics, University of Heidelberg. All participants received 5 Euro for their participations. The total duration of this experiment was approximately 30 minutes.

4.4 Materials: Language production and memory task

For the first part of the present study--language production + eye-tracking--a set of 60 short video clips showing everyday situations were used. All clips were 6 seconds long. After each clip an inter-trial interval appeared for 8 seconds in order to allow participants sufficient time for verbalization. The material was presented on a computer screen in four different pseudo-randomized orders so that participants within a particular group were assigned to these lists on an equal basis. The clips

were developed for a previous study (v. Stutterheim et al., under review) and were filmed and cut by the members of the project. Three groups of clips were tested (see Appendix A for a description of critical and control items).

(1) The first group consisted of 12 *critical* test items. Crucial for this type of clip was that the situation depicted locomotion in which the reaching of an endpoint was not shown in the clip. So, if a speaker mentioned a possible endpoint, it had to be inferred. An example of a critical item would be the following situation: Two women are walking in the direction of a building which stands at the horizon; the clip depicts the initial and intermediate but not the final phase of the event (see in the Appendix C, example (1), for a screen shot of one of the critical items). For critical items, the perceived distance between the moving entity and a possible endpoint was tested in a pilot study with 40 graduate and undergraduate students. In this study, participants had to judge 20 goal-oriented motion events on a scale from 1 (very small) to 5 (very large) of their perception of the distance between the moving entity and a possible endpoint. Items in which the distance was either perceived as very small (1) or very large (5) and items for which the judgments varied across participants were not included into the stimulus set. Only those items which had comparable judgments from the participants were chosen.

I hypothesize that when verbalizing critical items in the target language, L2 speakers will display conceptual patterns with respect to the inclusion of a possible endpoint which constitute preferences for construal of goal-oriented locomotion in their respective L1. This means that Czech L2 learners of German will display a preference for the holistic perspective by inferring a possible endpoint while Russian L2 learners of German will select more frequently the ongoing perspective focusing on the intermediate phase and ignoring a possible endpoint of the depicted locomotion.

(2) The second group of clips comprised 12 *control* test items. Like the critical items, these clips also encoded locomotion which, in contrast to the previous clip type, reached the endpoint. For example, a control item would depict a situation in which a dog is running across a backyard towards a house (see in the Appendix C, example (2), for a screen shot of one of the control items). In all cases, the critical and control items involve different types of motion events, a necessary pre-condition for ensuring naturalistic and spontaneous event descriptions.

The hypothesis here is that all speakers (L1 or L2), independent of their mother tongue, will mention the endpoint, i.e. in the example above: the house. The direction of entrance was controlled for both animate and inanimate objects in both critical and control items.

(3) The third group of clips had 40 *filler* items, which served to distract the participants from the actual goal of the experiment. These clips showed 26 dynamic situations with causative events (e.g., making a necklace), and 14 static scenes (e.g., a candle burning).

The subsequent memory task comprised 15 scenes: 10 critical and 5 fillers from the stimulus set. They were presented as printed colored screen shots in which a particular section was cut out. This was the endpoint area for the critical items, while in the filler items a specific object was cut out. The latter items were included in order to control for general memory performance (for a screen shot see the Appendix C, example (3)).It was expected for the performance in the target language that L2 learners with L1 Czech, an endpoint-oriented source language, would perform better in remembering objects present in the endpoint region, compared to l2 learners with L1 Russian, a non-endpoint-oriented language, which allows phasal decomposition and thus the focus on ongoingness of the motion event shown.

4.5 Apparatus

The apparatus used in recording eye movement was the remote system Eye Follower™ developed by Interactive Minds, Dresden, Germany on the basis of an LC-Technologies system. The cameras are attached to the monitor for binocular eye tracking and the eye-gaze system accommodates all natural head movements during normal computer operation. The gaze point sampling rate is 120 Hz, with a highly accurate 0.45 degree gaze-point tracking accuracy throughout the operational head range. The TFT monitor is 20 inches and participants were seated approximately 50 to 80 cm from the screen. Calibration was carried out once for each participant before the experiment (tracking eye-gaze on yellow dots on a black screen which appeared in identical order at specific positions on the screen).

4.6 Experimental procedure

Participants read instructions in German which stated that they would see a series of short, unconnected video clips which they would be asked to describe. The participants were instructed that they must focus on a point on the computer screen before each video so that it would be able to play. They were explicitly instructed to avoid unnecessary detail and concentrate on describing what is happening in the video clips (see Appendix B for the exact wording of the instructions in German). Subsequently the instruction was also explained to the participants orally. The only language spoken during the experiment was German and the experimenter was a native speaker of German.

Given the automatic adaptation of the cameras to eye position (*automatic eye acquisition*), no recalibration was necessary during the production task. Cases in which initial calibration was not fully successful were excluded. This was the case for one Czech and one Russian participant. Each session lasted approximately 15 minutes with no option of manipulating the presentation pace of the 60 items. Following the eye-tracking experiment, participants spent approximately 5 minutes filling out a questionnaire on their educational and linguistic background (see Appendix B). Participants were then asked to carry out a memory test which took between 2 to 5 minutes. This task was used to test memory performance with respect to the (potential) endpoints shown in the video clips. This part of the experiment was not announced at the outset so speakers could not prepare for it during information intake.

4.7 Data coding and analysis

The data were first transcribed and then coded for verbal forms-–temporal/aspectual categories-– as well as the inclusion of possible endpoints in critical and control items. Transcriptions as well as coding were checked by a second researcher. Based on the measurement of the data and the number of coders, the Cohen's kappa index was selected as a proper measure of inter-coder reliability. The value of the Cohen's kappa index between the two coders was 0.85. For the interpretation of the results, I relied on Landis and Koch's (1977) benchmarks for assessing the relative strength of agreement: *Poor* (< 0), *Slight* (.0 - .20), *Fair* (.21-.40), *Moderate* (.41 - .60), *Substantial* (.61 - 80), and *Almost Perfect* (.81 - 1.0). In line with this classification, the average coders' agreement is *almost perfect*.

For the analyses of the eye-tracking data, areas of interest (AoI) that included the endpoint area of the motion event were defined for all critical and control items. I am aware of the fact that the slight variance in AoI size across the different individual items represents a potential cause for discrepancy in attention allocation patterns between items. However, this is a necessary concession when dealing with dynamic, live-recorded stimuli. The motivation underlying the choice for this type of stimuli is the fact that only this type of stimuli allows for cross-linguistic variation in linguistic encoding. Line-drawn or animated stimuli are less suited for obtaining language-specific preferences in event encoding. In *both* conditions the AoI always involves one specific object (e.g. building, car, door of a building), which may differ slightly in size between individual items, a comparison between the two conditions should be justified.

The area of interest remained fixed in the respective clip while the figure moved along a path. The AoIs differed in size depending on the area at goal. In the clip

illustrated in the Appendix C, example (4), the AoI analyzed (houses at the bend in the road) is framed by a red rectangle.

The analyses were carried out automatically using the software system NYAN, developed by Interactive Minds, and adapted to the requirements of analyzing eye-gaze in relation to a dynamic visual input. In order to quantify patterns of eye movement, the measures adopted in the present analyses are those tested and proven in a large number of studies: overall number of fixations in AoI (total fixation counts), the overall probability of speakers having a fixation in AoI (total gaze), and the probability of speakers having a fixation in AoI in the first pass (fixations in AoI: first pass), where a pass is defined as the period of fixation from the first fixation in the area of interest until the first fixation outside the area of interest. The first and second pass are defined as the first or second time after stimulus onset that speakers spent a period fixating on points within the AoI. Use of the measure "pass" stems from analyses of gaze patterns when reading (cf. Duchowski, 2007).

Fixations within the AoI were calculated by NYAN using an area-based algorithm where a set of fixations with a maximum deviation of 25 screen pixels (corresponding to a gaze movement of less than roughly 0.5° and approximately 68 cm distance from eye to the screen), and a minimum sample count of 6, is recognized as a fixation. The degree (°) is related to the rotation of the eye (the direction of the eye). Accordingly, all samples with a greater deviation (i.e. gaze movement) are treated as saccades, i.e., movements that cover more than 0.5° in scene perception (at the average distance and monitor dimensions given).

5. Results

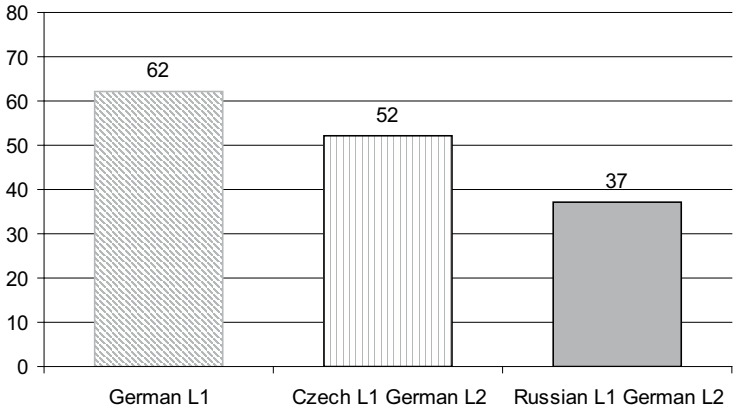
5.1 Language production data

For both testing conditions, reaching of an endpoint not shown in the clip (critical) and reaching of an endpoint shown in the clip (control), the number of endpoints verbalized by both learner groups and the control group were analyzed and compared. In the control condition no differences were found between the groups ($\chi^2(2) = 1.38$, *ns*). These findings confirm the hypothesis formulated in Section 4.4 which stated that L2 (or L1) speakers will mention the endpoint in the control test items to the same extent independent of their mother tongue.

By contrast, differences were found in the number of endpoints mentioned in the critical condition ($\chi^2(2) = 15.94$ $p < .05$). Figure 1 presents the results for German native speakers (German L1), Czech learners of German (Czech L1 German L2), and

Russian learners of German (Russian L1 German L2) in terms of the percentage of endpoints mentioned in the critical condition:

Figure 1. Percentage of endpoints mentioned for the critical items



A significant effect showed the comparisons between German native speakers and Russian learners of German ($\chi^2(1) = 15.88$, $p < .05$) and Czech learners of German and Russian learners of German ($\chi^2(1) = 21.36$, $p < .05$). There were no differences between native speakers of German and Czech learners of German with respect to the number of mentioned endpoints ($\chi^2(1) = 1.76$, *ns*). In addition, I conducted an analysis comparing the use of bare verbs for the encoding of goal-oriented motion (see examples (8) and (10)) by Czech and Russian learners of German. Russian learners used significantly more bare verbs in the critical condition than Czech learners (χ^2 (1) = 21.36, $p < .05$). No difference was found for the control condition (χ^2 (1) = 1.13, *ns*).

These results are in line with the hypothesis that L2 speakers will display the inclusion of a possible endpoint in conceptual patterns, which constitutes preferences for construal of goal-oriented locomotion in their respective L1: For critical test items, Czech learners of German mentioned a possible endpoint more frequently than Russian learners of German. Additionally, Russian learners of German produced in the L2 more constructions with a bare verb (e.g. *Das Auto fährt* – 'The car is riding') than Czech learners of German.

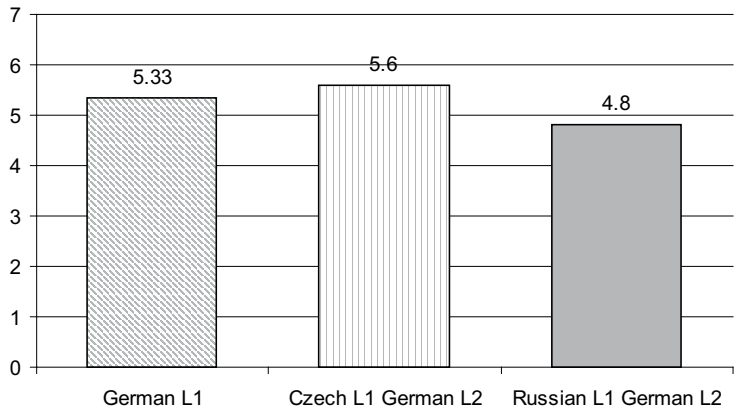
5.2 Eye-tracking data

The following measures were applied to assess and compare the eye-tracking results: the total frequency of fixations within the AoI (*total fixation counts*), the percentage of speakers who looked in the AoI (*total gaze in the AoI*), and the percentage of speakers who looked in the first pass in the AoI (*fixations in AoI: first pass*). The mean values were calculated on the basis of the item analysis. Total fixation counts reflect allocation of attention to the AoI (=possible endpoint) measured over one time period (four passes). The second measure, total gaze in the AoI, provides information about the probability for speakers to have at least one fixation in the AoI during one measuring period. Following the same rationale, the third measure provides the same type of information for the first pass (first looking period measured).

Total fixation counts

A two-way ANOVA showed a main effect for condition $F(1,2260) = 621.93$, $p < .05$, and for speaker group $F(2,2260) = 17.94$, $p < .05$. The interaction between two factors was also significant $F(3,2260) = 249.89$, $p < .05$). Bonferroni corrected post-hoc t-tests revealed that in the critical condition Russian learners of German differed from Czech learners of German $t(502)= 18.46$, $p < .05$) and native speakers of German ($t(502) = 21.74$, $p < .05$) while Czech learners and German native speakers did not differ ($t(502) = 1.5$, *ns*). In the control condition, no differences in the number of fixations in the AoI were found across groups (Czech learners versus German learners: $t(502) = -.918$, *ns;* Czech learners vs. German native speakers $t(502) = 2.1$, *ns*; Russian learners vs. German native speakers $t(502) = 2.4$, *ns*). Figure 2 provides an overview of the average total fixation counts in the AoI in the critical condition:

Figure 2. Average total fixation counts in the AoI (critical condition)



These findings corroborate the results from the language production task and add yet another piece of evidence in favor of our hypothesis that L2 speakers will follow the construal patterns of their respective L1 when conceptualizing goal-oriented locomotion in the target language.

Fixations in AoI: total gaze in the AoI

Figure 3 presents data, which depict the percentage of speakers who had at least one fixation in the AoI in the critical condition.

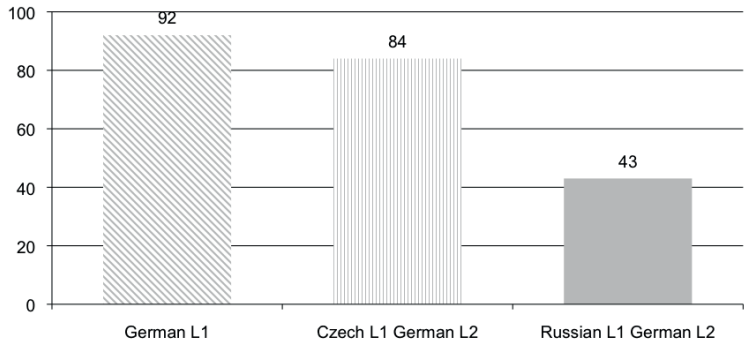
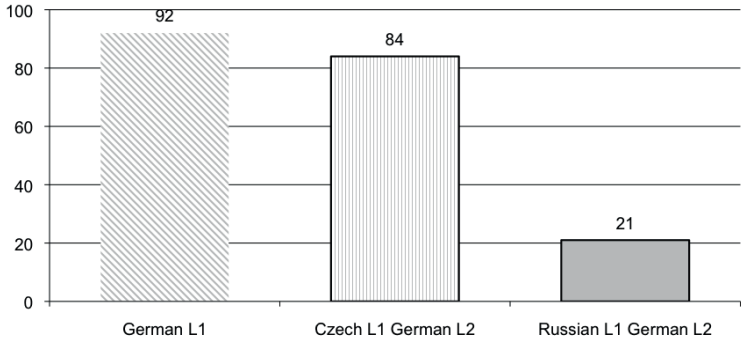


Figure 3. Percentage of speakers who had at least one fixation in the AoI (totalgaze) A two-way ANOVA across participants (F_1) and an independent two-way ANOVA across items (F_2) was conducted to investigate whether subjects fixated the endpoint in all fixations (total gaze). For each speaker group was calculated how many of the 21 subjects of each group fixated the endpoint in the critical and control condition. In the control condition, no differences were found between groups. In the critical condition, language group turned out to be a highly significant factor both in the F_1 and the F_2 analysis: F_1 (2,60) = 43.06; *MSE* = 119.29, $p < .001$; F_2 (2,66) = 22.35; *MSE* = 208.35 $p < .001$). Additional Bonferroni corrected post-hoc comparisons revealed that the Russian learners of German differed both from the group of German native speakers as well as Czech learners of German, while German native speakers and Czech learners of German showed the same pattern.

Fixations in AoI: gaze in the first pass

An analogous analysis was carried out for the probability of having at least one first period of fixation (first pass) in the AoI across groups. Figure 4 shows the results for the critical condition.

Figure 4. Percentage of speakers who had at least one fixation in the AoI (first pass)



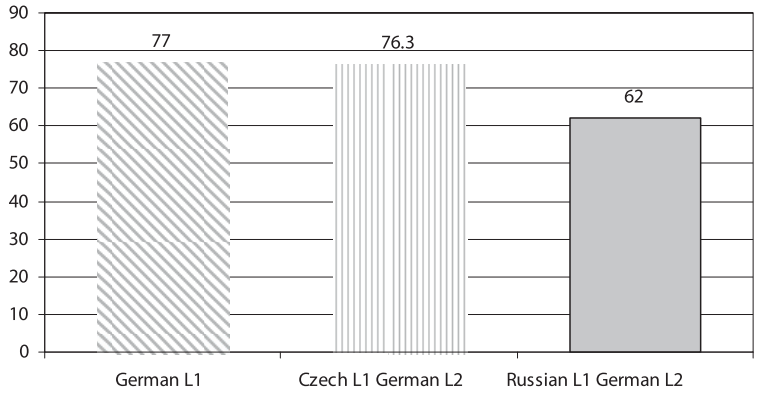
A two-way ANOVA across participants (F_1) and an independent two-way ANOVA across items (F_2) was conducted to investigate whether subjects fixated the endpoint in the first pass. For each speaker group was calculated how many of the 21 subjects of each group fixated the endpoint in the critical and control condition. Like for the total gaze into AoI, no differences were found between groups in the control condition. In the critical condition, language group was a highly significant factor both in the F_1 and the F_2 analysis: F_1 (2,60) = 89.14; *MSE* = 240.25, $p < .001$; F_2 (2,66) = 45.27; *MSE* = 380.43 $p < .001$). Additional Bonferroni corrected post-hoc comparisons revealed that the Russian learners of German differed both from the group of German native speakers as well as Czech learners of German, while German native speakers and Czech learners of German showed the same pattern. A summary table for total gaze in AoI and first pass fixation in AoI is provided in Appendix D.

In summary, the eye-tracking data point in the same direction: German native speakers and Czech learners of Germen cluster in one group whereas Russian learners of German differ in all three measures: fixation counts, the overall probability for speakers to look at least one time in the AoI, and the probability for speakers to look in the AoI during the first pass. These results show that Czech and Russian L2 speakers rely on different language-specific patterns not only when speaking about goal-oriented motion events (language production), but also when conceptualizing these events (allocation of attention). These L1-specific patterns of event construal are persistent even in very advanced L2 speakers when they conceptualize locomotion in the L2.

5.3 Memory data

While no significant difference was found between groups for the control items ($\chi^2(2) = 0.26$, *ns*), the critical items showed a significant group effect ($\chi^2(2) = 139.41$, $p < .05$). Figure 5 gives the percentages for the endpoints remembered for critical test items.

Figure 5. Percentage of endpoints remembered for critical items



Comparisons between groups revealed the following effects: German native speakers versus Russian speakers of German (χ^2 (1) = 74.86, $p < .05$), and Czech learners of German versus Russian learners of German (χ^2 (1) = 116.54, $p < .05$). German native speakers and Czech learners of German did not differ in terms of remembered endpoints for the critical items (χ^2 (1) = 2.12, *ns*). These results show that not only do Russian speakers not express or fixate on endpoints as much as German and Czech speakers, they are also less likely to remember them, indicating an overall reduced attention to these endpoints, which are grammatically optional in their L1.

6. Discussion

The results of the linguistic and eye-tracking analyses show a strong link between linguistic structure(s) and linguistic preferences, patterns of visual attention as well as memory data. In line with previous literature (cf. Carroll, v. Stutterheim, Nüse, 2004; Slobin, 1996; v. Stutterheim and Nüse, 2003;) I argue that patterns of motion event construal differ in relation to the grammatical system of the L1: Grammaticalized structures play a crucial role in determining how speakers proceed in solving the manifold tasks of language production. In keeping with the view of cognitive linguistics (cf. Langacker, 2010; Talmy, 2000), I assume that grammatical

categories are fundamental for organizing content. They represent basic conceptual categories that are highly abstract, fully automatized, and provide a conceptual grid for planning processes (conceptualization) recruited for language production.

Before turning to the findings related to the L2 speakers, some attention should be paid to the clustering of the Czech and German groups. As some previous studies have shown (e.g. v. Stutterheim et al., forthcoming), Czech native speakers cluster with speakers of the endpoint-oriented languages such as German in linguistic, non-linguistic and eye-tracking measures. Even though Czech, like Russian, is an aspect language, speakers behave differently when conceptualizing goal-oriented motion events. The findings by v. Stutterheim et al. (forthcoming) are supported by results from other analyses, which showed that the Czech aspectual system has been affected by language contact with German. In particular, a re-analysis of the perfective has led to a verbal form which allows for the integration of endpoints under the perspective of the deictic, now that is expressed as the combination of a perfective (event marked as complete) and the present tense, under a present tense reading (cf. Schmiedtová, 2009; Schmiedtová and Sahonenko, 2008, Schmiedtová, von Stutterheim, and Carroll, in press). The following example from Czech gives a possible answer to the question 'What is happening?' (*Co se děje?*): *Holka vy-pije* (Present Perfective in here-and-now interpretation) *celou sklenici* (A girl drink.3sg. Present up an entire glass). This is not grammatical in Russian: **Devuska vypet celyj stakan* (only possible in future tense reading). The results of experimental studies are relevant for theoretical studies on the semantics of aspect.

In contrast to descriptions in reference grammars, the observed compatibility of the perfective and the present tense in Czech shows a marked difference from the other Slavic languages with respect to grammaticalized aspect. The present findings illustrate the importance of comparing actual usage preferences across languages; in addition to cross-linguistic categorizations based on the linguistic system (see also König, 2010 for a comprehensive typological study on European languages).

As to my original research interest, the understanding of the 'cognitive profile' of very advanced learners, I would like to stress the suitability of the eye-tracking method for the investigation of this topic. The method makes possible to get an "insight" into the highly automatized planning processes, which take place prior to and while speaking, and it allows researchers to make some claims about the degree of restructuring.

With respect to the scope of restructuring, the results of this study suggest that even for L2 speakers with near-native command of the L2, conceptual knowledge seems to be resistant to conceptual shift towards the target language. Although L2

speakers in the present study were very successful in learning the necessary forms and their appropriate functions, they seemed to not succeed in mapping these forms onto the organization principles required for the construal of motion events in the target language. It is likely that the majority of L2 learners do not fully learn these principles that are involved in conceptualizing content for speaking. One of the reasons for this learning difficulty is that since there is no one to one mapping of forms onto functions, it is extremely hard to recognize the role, which grammaticalised means play in information organization.

How can we place and interpret the findings of the present study in the context of previous studies, which have found evidence for restructuring in highly successful L2 speakers? The first challenge in this respect is related to the comparability across different tasks. Von Stutterheim and Carroll (2006) or Cadierno and Ruiz (2006) for instance, found restructuring in advanced L2 speakers, but their claims are mainly based on linguistic data from elicitation tasks. The question here is whether linguistic results can be taken as evidence restructuring in non-linguistic domains, such as memory or categorization. In my opinion, this is highly problematic: Although restructuring of the linguistic system strongly interacts with restructuring of conceptual or cognitive structures, it does not automatically lead to it. In addition, restructuring does not necessarily affect the whole system, it is in fact found to be specific to a particular domain (cf. Jarvis, 2003), and all language modalities (i.e. production versus comprehension). This issue is closely related to another problem, which concerns the differences of the type of conceptual knowledge required for the tasks assessing restructuring. Naming or categorization of objects, for example, is concerned with "more basic" knowledge in the semantic-lexical domain whereas the event construal or narratives test "more complex" structures at the level of information organization necessary for the production of speech or gesture. These complicating factors may partially account for the variations found in the available evidence on conceptual restructuring in advanced L2 speakers (*In favor*: cf. Brown and Gullberg, 2008; Cadierno, 2004; Cook et al., 2006; Malt and Sloman, 2003; Wolff and Ventura, 2009; *Against*: cf. Carroll, 1997; Carroll and Lambert, 2003; Carroll and v. Stutterheim, 2003; Hendriks et al., 2008; Kellerman and van Hoof, 2003; Schmiedtová, 2004; Schmiedtová and Sahonenko, 2008). The results of the present study are consistent with those studies that found no or partial evidence for conceptual restructuring in L2 speakers.

7. Conclusion

The study discussed in this paper shows the relevance of grammaticalized categories for the construal of goal-oriented events in first and second language. The

findings suggest that languages can be clustered on the basis of preferred patterns of information organization.

The present study adds a novel piece of evidence to the current debate on restructuring by not only combining a linguistic with a non-linguistic task, but also by measuring eye movements. The findings that are consistent across all three measures (linguistic, eye-tracking, memory) suggest that conceptual restructuring of complex structures is rather limited and seems not to be attainable for highly proficient learners in the L2.

Acknowledgements

I would like to thank Valentina Mozharova and Friederike Oeldorf for helping to recruit the participants and later collecting and transcribing the data. Many thanks also to Takara Baumbach for the processing of the data and Frauke Hellwig for providing many helpful insights on the statistical analyses. I am also grateful to Danielle Mathieu-Reeves for her clever comments, corrections and formatting of earlier drafts of this paper. All remaining errors in fact or interpretation are, however, mine.

Appendices

Appendix A: Stimuli used for analyses

Critical condition: 'Endpoint not reached' 12 items

Video clip	Description
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 gas station)
11	a woman is riding a bicycle down the road (towards a village)
12	a girl is walking down the street (towards a café)

Control condition: 'Endpoint reached' 12 items

Video clip	Description
1	a car is driving into a garage
2	a girl is entering the station
3	a van is turning into a driveway
4	a man on a bicycle is turning into a gateway
5	a woman is entering a supermarket
6	a dog is running through the door of a building
7	a cat is walking into the kitchen
8	a child is going through a gate into a playground
9	a man is walking into a church
10	a girl on a horse is riding into a barn/stable
11	a girl is riding her bicycle into the forest
12	a train is going into a tunnel

Appendix B: Questionnaire focusing on social and linguistic background (in German**)**

Danke, dass Sie sich bereit erklärt haben, an unserer Studie teilzunehmen. Bitte, beantworten Sie alle Fragen in diesem Fragebogen. Ihre Antworten werden streng vertraulich behandelt.

1. Datum:
2. Name (Vorname+ erster Buchstabe des Nachnamens; z.B: Maria S.):
3. E-mail-adresse (optional):
4. Alter in Jahren: Geschlecht: Männl. / Weibl.
5. Linkshändig / Rechtshändig?
6. Geburtsort (Stadt, Land)
7. Wo sind Sie zur Schule gegangen? (Stadt, Land)
8. Haben Sie in der Schule auch Deutsch gesprochen (z.B. ein deutschsprachiges Gymnasium in Tschechien/Russland besucht)? Wenn ja, wo und wie lange.
9. Studium an einer Universität /einer Fachhochschule (Stadt, Land)?
10. Haben Sie an der Uni Deutsch gesprochen (z.B. Germanistik studiert)?
11. Sprechen Sie andere Sprache(n) als Ihre Muttersprache mit Ihren
    Eltern Geschwistern Partner/in
    Freunden Kollegen/innen Kindern
12. Wenn ja, welche Sprache(n)?
13. Welche Sprachen haben Sie in der Schule gelernt? Wie viele Jahre?
14. In welchem Alter haben Sie angefangen, Deutsch zu lernen?
15. Welchen Grad der Ausbildung haben Sie erreicht? (Bitte ankreuzen)
    mittlere Reife Abitur Bachelor
    Magister/Master/Diplom/Staatsexamen Promotion
16. Falls Sie studieren/studiert haben, was waren / sind Ihre Haupt- und Nebenfächer?
17. In welchem Land haben Sie Ihren Abschluss gemacht?
18. Falls Sie in Deutschland leben oder gelebt haben, wie lange?
19. In welchen anderen Ländern haben Sie schon gelebt oder studiert? Wie lange?
20. Welche Sprachen haben Sie bei Ihren anderen Auslandsaufenthalten gesprochen?
21. Falls Sie schon arbeiten, welchen Beruf üben Sie aus?
22. Welche Fremdsprache (nicht Ihre Muttersprache!) sprechen Sie Ihrer

Meinung nach am besten? 23. Wie würden Sie Ihre Kenntnisse der besten Fremdsprache beurteilen? Tragen Sie bitte in das entsprechende Kästchen ein X.

	Ausgezeichnet	Sehr gut	Gut	Ausreichend	Schlecht
Lesen					
Schreiben					
Verstehen					
Sprechen					

Danke für Ihre Kooperation!

Appendix B: The German instructions

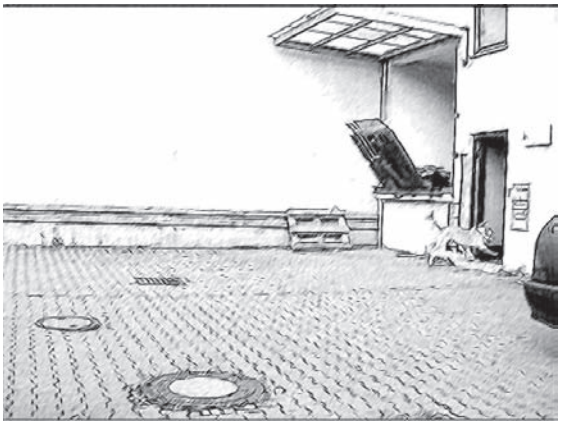
Sie werden eine Reihe von insgesamt 60 kurzen Videos sehen, die alltägliche Situationen zeigen und nicht in Verbindung miteinander stehen. Vor jedem Video werden Sie auf dem dunklen Bildschirm einen Fokussierpunkt sehen. Bitte schauen Sie auf diesen Punkt, da es nur dann möglich ist, die nächste Szene abzurufen. Ihre Aufgabe ist es zu sagen, was passiert? Sie können beginnen, sobald Sie erkennen, was in dem Video vor sich geht. Berücksichtigen Sie dabei keine Einzelheiten der Szene (z.B. der Himmel ist blau). Konzentrieren Sie sich auf das, was passiert.

Appendix C: Pictures

Example (1): critical test item

A car is riding on a country road; in the background one can see the first houses of a village; the car does not reach the village entrance in the clip.

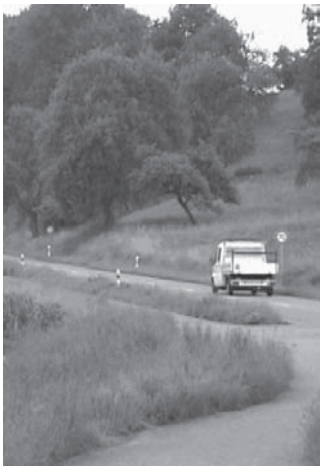
Example (2): control test item



A dog is running into a house; the dog disappears into the house in the clip.

Example (3): Memory task

Critical test item



Control test item

Example (4): A car driving along a road (to a village): AoI

Appendix D: Overview – absolute values and percentages – total gaze in AoI, first pass gaze in AoI

Absolute values				Percentages		
First Gaze				First Gaze		
	Control	Critical			*Control*	*Critical*
GER	187	232		GER	74.21	92.06
CZE	190	214		CZE	75.40	84.92
RUS	184	54		RUS	73.02	21.43
Total Gaze				Total Gaze		
	Control	Critical			*Control*	*Critical*
GER	187	232		GER	74.21	92.06
CZE	191	214		CZE	75.79	84.92
RUS	184	106		RUS	73.02	42.06

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