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Motion event cognition and grammatical aspect: Evidence from Afrikaans

Abstract: Research on the relationship between grammatical aspect and motion event construal has posited that speakers of non-aspect languages are more prone to encoding event endpoints than are speakers of aspect languages (e.g., von Stutterheim and Carroll 2011). In the present study, we test this hypothesis by extending this line of inquiry to Afrikaans, a non-aspect language which is previously unexplored in this regard. Motion endpoint behavior among Afrikaans speakers was measured by means of a linguistic retelling task and a non-linguistic similarity judgment task, and then compared with the behavior of speakers of a non-aspect language (Swedish) and speakers of an aspect language (English). Results showed the Afrikaans speakers' endpoint patterns aligned with Swedish patterns, but were significantly different from English patterns. It was also found that the variation among the Afrikaans speakers could be partially explained by taking into account their frequency of use of English, such that those who used English more frequently exhibited an endpoint behavior that was more similar to English speakers. The current study thus lends further support to the hypothesis that speakers of different languages attend differently to event endpoints as a function of the grammatical category of aspect.

Keywords: Afrikaans, cognition, endpoints, grammatical aspect, linguistic relativity, motion event

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1 Introduction

In its most generic conception, a motion event is a situation involving physical displacement, whereby an entity occupies different spatial locations at different points in time. Motion events are doubtlessly central to human everyday life: we walk, run, cycle, drive, and travel in many different ways, often on a daily basis, and usually with the intention to get from one place to another. Languages across the world offer a broad range of grammatical and lexical means that we may use to talk about motion events. However, languages also exhibit striking differences in the way they select and organize information about motion events. For example, to talk about a man coming out from a building, some languages (e.g., Spanish and isiZulu) would give prominence to the path of motion, whereas others (e.g., English and Norwegian) would highlight the manner of motion (Talmy 1975, 2000). In addition to differences in the packaging of manner and path of motion, languages across the world differ as to whether they convey information about the temporal distribution of an event. In some languages, there exists a possibility to present the motion event as either ongoing or completed (e.g., Russian and Sesotho), whereas in other languages (e.g., Swedish and isiXhosa), such information is left out or only optionally encoded.

Linking this crosslinguistic variation to the idea that linguistic structure may influence the way we think (Whorf 1941/1956), the question arises whether speakers of different languages not only talk differently about motion events, but also think differently about motion events. This question has been addressed by a series of recent studies that focus on the possible consequences of lexicalization of manner and path on motion event cognition (e.g., Gennari et al. 2002; Papafragou et al. 2002, 2006; Papafragou and Selimis 2010; Trueswell and Papafragou 2010). Findings from these studies provide a nuanced picture of the influence of language on thought, suggesting that some conditions may trigger crosslinguistic differences in cognition, whereas others do not. In tasks where participants for example have to commit facts to memory, or receive instructions that bias their attention, cognitive differences between speakers of different languages are likely to occur, whereas in tasks where such conditions are absent, such as online judgments or free visual inspection, cognitive differences between speakers are not found.

Whereas current linguistic inquiry into motion events predominantly focuses on the encoding of manner and path, a parallel line of research has investigated the role that the grammatical category of *aspect* plays in event construal. This line is complementary to the manner and path approach in two regards: first, it extends research on motion events to grammatical categories. The importance of examining the potential effects of grammar on cognition has been repeatedly un-

derscored throughout the years (Lucy 1992; Slobin 2003; Talmy 1988; also Whorf 1956). Second, whereas the locus of attention of current motion event research is on linguistic categories that primarily express *spatial properties*, the semantics of the category of aspect concerns the *temporal properties* of events. Given that evolvement through both space and time are fundamental characteristics of a motion event, investigating a linguistic category that encodes event time affords a possibility to further our understanding of event representation in language and cognition. Findings from several studies within this line of inquiry show that speakers of languages that lack grammaticized obligatory aspectual distinctions of the imperfective and/or perfective (so-called 'non-aspect languages', e.g., Dutch, German, Norwegian, and Swedish) are more prone to encoding motion event endpoints than are speakers of languages in which such aspectual distinctions are obligatory (so-called 'aspect languages', e.g., Algerian Arabic, English, Russian, and Spanish) (cf. Bylund 2008, 2009, 2011; Bylund and Jarvis 2011; Carroll and von Stutterheim 2006; Flecken 2011a; Schmiedtová et al. 2011; von Stutterheim and Nüse 2003).

The present study is situated within the line of research that examines the relationship between grammatical aspect and motion event endpoints. Our principal aim is to extend this line of inquiry to Afrikaans, a non-aspect language that so far has remained unexplored in this regard. In doing so, we will test the hypothesis that speakers of non-aspect languages are more prone to encoding event endpoints than are speakers of aspect languages (e.g., von Stutterheim and Carroll 2011). In order to gain insight into the representation of endpoints in both language and cognition, we will examine both linguistic as well as non-linguistic behavior.

2　Background

2.1　Grammatical aspect and event endpoints

Imagine a scene where two people are walking along a road, at the end of which there is a house. Before the people reach the house, the scene ends. To describe this scene, the speaker may choose to adopt a holistic perspective, or a *maximal temporal viewing frame*, according to which the event is interpreted in its entirety. In this perspective, the event endpoint is included (i.e., *two people walking to a house*). Another possibility for the speaker, however, is to adopt an *immediate temporal viewing frame*, whereby only the ongoing phase of the event is zoomed in on, and the event endpoint is excluded (i.e., *two people walking*) (see Langacker 1987, 2008).

A growing number of studies have shown that the choice of event perspective, or viewing frame, is to a great extent related to the grammatical category of aspect. Generally defined, the basic function of this category is to denote the internal temporal constituency of an event, in the sense that it allows the speaker to either verbalize the ongoing phase (imperfective aspect) or the phase of completion (perfective aspect) of a given event (see further Comrie 1976; Dahl 1985; Klein 1994). Evidence from speech production data demonstrates that when describing unfolding goal-oriented motion events, speakers of languages with grammatical aspect are more prone to adopting an immediate viewing frame and exclude reference to endpoints. Speakers of languages lacking grammatical aspect, in contrast, show a higher preference to take a maximal viewing frame, mentioning the event endpoint. This finding has been shown to be consistent across a number of different languages, such as Algerian Arabic, English, Russian, Spanish (aspect languages), and Dutch, German, Norwegian, Swedish (non-aspect languages) (Schmiedtová and Flecken 2008; Schmiedtová and Sahonenko 2008; von Stutterheim 1997, 2003; von Stutterheim et al. 2002; Bylund 2008, 2011).[1] Evidence of a direct link between grammatical aspect and endpoint encoding is provided by a study on Swedish-Spanish bilinguals (Bylund and Jarvis 2011). In this study, which focused on the bilinguals' Spanish language skills, it was found that sensitivity to aspectual errors was negatively correlated with a predilection for encoding event endpoints, in the sense that the weaker the bilinguals' command of the Spanish perfective-imperfective contrast, the more prone they were to encoding endpoints (thus deviating from the Spanish monolingual preference to encode few endpoints).

The correlation between grammatical aspect and linguistic encoding of event endpoints is typically interpreted in accordance with Slobin's (1991, 1996) *Thinking-for-Speaking Hypothesis*. According to this hypothesis, the linguistic categories available to the speaker influence the way he or she thinks when in the process of preparing content for speech (i.e., the process of conceptualization in language production [Levelt 1989]). Applying this reasoning to the findings reviewed above, von Stutterheim and colleagues suggest that the fact that a language has grammaticized distinctions of imperfectivity implies that the internal temporal constituency of events is given prominence in the conceptualization of

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1 For the sake of clarity, it should be noted that the non-aspect languages enumerated here may, of course, express aspectual contrasts by means of lexical and phrasal constructions, but they differ from the aspect languages in two important ways: First, they do not encode aspectual contrasts on an obligatory scale, and second, the constructions used to convey such contrasts typically have limited application and are only combinable with certain verb types. We will return to discuss this dichotomy in section 5.1.

states of affairs (e.g., Carroll et al. 2004). Speakers of aspect languages are, as a consequence, sensitized toward ongoingness (i.e., the aspectual viewpoint of 'event in progression') and more prone to taking an immediate viewing frame of an unfolding event whereby the possible event endpoint is excluded. The reason why speakers of languages without grammaticized imperfective aspect do not exhibit the same behavior is allegedly because they are not pointed by their grammars to pay attention to the internal temporal constituency of events. Instead, these speakers are more inclined to maximal temporal viewing frames in their construal, according to which event endpoints are included.

The empirical findings on the relationship between grammatical aspect and event endpoints are not limited to speech data only. Additional evidence of crosslinguistic differences in behavior with motion endpoints is provided by von Stutterheim et al. (2006) and Schmiedtová et al. (2008). Using eye-tracking techniques, these studies have demonstrated that when confronted with the task of describing a motion event scene, speakers of different languages exhibit differences in their allocation of visual attention: speakers of Arabic, English and Spanish were shown to fixate the possible goal of motion to a significantly lesser extent than speakers of Dutch and German. These results are important in the sense that they complement previous findings on language-specific patterns of endpoint encoding, showing that the omission of endpoints in the scene descriptions by some language groups may not be interpreted simply as a result of these speakers not deeming it worthy to mention endpoints; rather it seems as if these speakers, in fact, fixate the motion endpoints in the scenes to a much lower extent. On the basis of these findings, von Stutterheim and colleagues have formulated the so-called *Seeing-for-Speaking Hypothesis*. According to this hypothesis, a speaker of a language that codes a certain meaning grammatically (in this case the notion of ongoingness) will attend to the relevant feature of a given visual scene, whereas a speaker of a language that only codes this meaning optionally through lexical and phrasal means will be less prone to attend to the same feature (Carroll and von Stutterheim 2011; von Stutterheim et al. 2012).

The findings reviewed above provide robust evidence of the impact of grammatical aspect on the processes of selecting information and allocating attention for verbal encoding of goal-oriented motion events. However, they do not directly address the possible effects of grammatical aspect on *non-verbal* event cognition, that is, they say little about the thought processes taking place when the speaker is not engaged in preparing content for speech. As pointed out by Lucy (1992, 1996, 1997), in order to gain insight into such processes it is crucial that scholars deploy tasks that assess non-linguistic performance. Examples of such non-linguistic tasks are classification, categorization, sorting, and memory retrieval (Lucy 1997). These tasks are fundamentally different from speech elicita-

tion tasks, since they aim to elicit data on higher cognitive processes such as categorization or classification (as opposed to low-level cognitive processes, e.g., automatic perceptual processing).

In view of this reasoning, Athanasopoulos and Bylund (2013) set out to examine the influence of grammatical aspect on non-verbal event cognition using a triads matching paradigm. In this design, participants had to watch triads of video clips showing motion events with different degrees of goal-orientation (video clips had been provided by von Stutterheim and colleagues). The target clip showed motion towards a goal (intermediate degree of goal-orientation), whereas the alternates showed either motion without obvious endpoint (low degree) or motion with arrival at a goal (high degree). The clips were presented in three different conditions: one where the clips in each triad were played next to each other in a loop until the participant had made his/her judgment ("online condition"); one where the clips played one after another and the participant was to provide his/her judgment after having watched the last clip in each triad ("memory condition"); and one similar to the memory condition with the exception that the participant had to repeat a string of digits while watching each triad ('verbal interference condition').

The results showed that when participants had to match events in the memory condition, speakers of Swedish were significantly more prone to pair the target clip with the high degree alternate than were the English speakers. No cross-linguistic differences were found in the other conditions. Athanasopoulos and Bylund argued that the reason why differences between groups were found in the memory condition was due to the fact that the memory task posed greater cognitive demands on the participants, thus encouraging and increasing reliance on verbal strategies to solve the task. The interpretation that language is recruited to solve mental tasks that involve a memory component was tested in a follow-up experiment with a verbal interference component. The underlying rationale of this experiment was to engage the language system in another task (in this case, that of repeating numbers aloud) in order to reduce the participants' possibility to commit facts to memory with the help of language. In this experiment, the cognitive differences between Swedish and English speakers consequently disappeared. These results thus suggest that the effects of grammatical aspect on non-verbal event cognition are primarily circumscribed to situations where the speaker has to commit facts to memory – and is able to rely on language to do so. This finding is consistent with studies on the cognition of manner and path of motion, demonstrating that memory conditions are likely to trigger crosslinguistic differences in event cognition (Papafragou and Selimis 2010; Trueswell and Papafragou 2010).

2.2 The Afrikaans language

Afrikaans is a language with Germanic roots spoken in Southern Africa. While there is consensus among scholars that Afrikaans originates from Dutch, its path of development remains to this day subject to debate. The fact that Afrikaans, as opposed to Dutch, for instance has double negation and lacks verb agreement and grammatical gender has given rise to a number of different theories, some positing that Afrikaans is a 'semi-creole' with Dutch lexifier (e.g., Holm 1989; Thomason and Kaufman 1988), others ascribing these idiosyncrasies to dialectal leveling (e.g., Combrink 1978; van Rensburg 1983) (for overviews and further discussion, see Deumert 2004; Roberge 2002).

Afrikaans is spoken as a native language in Namibia and South Africa by different ethnic groups, and can be split up along a continuum with Oosgrensafrikaans at the one end, representing the standard variety, and Kaaps-Afrikaans and Oranjerivierafrikaans at the other end. The Kaaps (spoken in the Western Cape) and Oranjerivier (spoken in the Northern Cape) varieties exhibit lexical influence from English and Malay, and Khoe-Khoe, respectively (Roberge 1995). The different varieties of Afrikaans are commonly associated with different ethnic groups, such that Kaaps-Afrikaans and Oranjerivierafrikaans are most likely to be spoken by so-called "Coloureds" (this does not mean, however, that all Coloureds speak Kaaps-Afrikaans or Oranjerivierafrikaans).[2] Both in Namibia as well as in South Africa, Afrikaans co-exists together with a variety of other languages (minority or official). This has as a consequence that native speakers of Afrikaans are more often than not proficient in other languages as well.

In Afrikaans, the basic aspectual distinctions of perfectivity and imperfectivity are not grammatically encoded. There is, however, a possibility to convey these aspectual contrasts by means of lexical periphrases. Examples of such structures are the posture verb constructions used to express ongoingness, for instance *lê en slaap* 'lie and sleep', *staan en praat* 'stand and talk', *sit en lees 'n boek* 'sit and read a book' These constructions exhibit a semantic link between the posture verb (i.e., *lê*, *sit*, *staan*) and the main verb, such that certain combinations are not possible, for example ??*staan en hardloop* 'stand and run'. The productivity of the posture verb constructions is, in other words, restricted. Another

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2 In South Africa, *Coloured* refers to an individual with mixed ancestry, including (but not excluding other possibilities) the indigenous Khoi-San, Malay, Indonesian, Indian and European. The term was imposed by the apartheid regime as an official racial designation. Even though the term *Coloured* is not uncontested in contemporary South African society, it is not generally considered derogatory and is widely used in media, and academic and political discourse (e.g., Orman 2008).

possibility to convey ongoingness is offered by the construction *besig om te* + VERB (literally 'busy to'), such as in *die man is besig om te skeer* 'the man is shaving'. This construction does not seem to share the same semantic restrictions as the serial verbs, since it can be used with a large number of different verb types, for example, *die kind is besig om die boek te lees* ('the child is reading a book'), or *die vrou is besig om na die gebou te hardloop* ('the woman is running to the building') (Donaldson 1993). The construction *aan die* + VERB ('at the') offers yet another possibility to express ongoingness (de Villiers 1971). Similar to the *besig om te* + VERB construction, this construction may be combined with verbs denoting both processes and motion (for a detailed study of progressive constructions in Afrikaans, see Breed 2012).

The Afrikaans ongoingness constructions described above have clear parallels with Dutch, in which ongoingness may be conveyed through posture verb constructions as well as the *bezig te* + VERB and *aan het* + VERB constructions. Even though these latter two constructions correspond in form to the Afrikaans constructions *besig om te* and *aan die*, they differ in terms of frequency of use: corpus studies have shown that in Dutch, the posture verb constructions are the most common ongoingness markers, followed by *aan het* and *bezig te*, whereas in Afrikaans, the *besig om te* construction is the most frequent, followed by *aan die* and posture verbs (Breed 2012).

Whereas the present tense in Afrikaans is not marked for aspect, the aspectual status of the past tense remains somewhat debated. The Afrikaans past tense, constructed periphrastically with *hê* ('have') + PAST PARTICIPLE derives from the Dutch present perfect tense. Most researchers analyze this form as a simple past tense that has not retained any of its original perfect value (e.g., universal or experiential perfect) (e.g., Dahl 1985; Deumert 2004; Donaldson 1993; Sailer 2004). It is, for example, not felicitous to combine the past tense with deictic temporal adverbials that denote that an event holds throughout a time interval that spans from a previous point in time to the utterance time, as is often possible with perfect tenses (cf. ??*nou het dit vir 5 dae gereën* 'now it has rained for 5 days'). However, it has also been suggested that the Afrikaans past tense has an ambiguous meaning (e.g., de Vos 2003), and may be interpreted as either temporal or aspectual. In favor of this position, van der Kleij (1999) provides the following example to show that a temporal use of the past tense is not combinable with temporal adverbials denoting the future, for example: *Nadat ek hom môre gesien het, sal ek alles vir jou vertel* ('After I have seen him tomorrow, I will tell you everything') (for further discussion of this position, see Sailer 2004).

2.3 Aims and scope of the current study

The general aim of the current study is to contribute with knowledge on motion event cognition in Afrikaans. More specifically, we will test the hypothesis that speakers of non-aspect languages are more prone to encoding event endpoints than are speakers of aspect languages (e.g., von Stutterheim and Carroll 2011). Having identified Afrikaans as a language that lacks the grammatical category of aspect, we predict that, with regards to motion endpoints, speakers of Afrikaans will behave like speakers of a non-aspect language rather than as speakers of an aspect language. To determine this, we will compare the Afrikaans speakers' behavior in this domain with that of speakers of Swedish and speakers of English.[3] Like Afrikaans, Swedish is a Germanic language that lacks the grammatical category of aspect. In order to express aspectual notions Swedish speakers may use lexical and phrasal circumlocutions. The English language, in contrast, encodes the notion of ongoingness grammatically via the progressive form. If the hypothesis about the influence of grammatical aspect on endpoint behavior is correct, then Afrikaans speakers should behave similar to Swedish speakers, and differently from English speakers.

In the current paper, event endpoint behavior will be explored in two different ways. First, we will examine the frequency with which Afrikaans speakers mention endpoints when describing goal-oriented motion events. This measure, which relates to verbal behavior, will be labeled *linguistic endpoint encoding*. Second, we will investigate non-verbal event endpoint preferences. To this end, we will use a memory-based triads matching task. This measure of endpoint behavior will be labeled *non-linguistic similarity judgment*.

As mentioned above, South Africa is a multilingual setting, with several of its inhabitants being functionally bilingual or even multilingual (Banda 2010). In view of previous research on bilingualism and thought showing that additional language learning may influence language-specific patterns of the native language (e.g., Athanasopoulos, 2007, 2009; Athanasopoulos et al. 2010; Brown and Gullberg 2008; Bylund and Jarvis 2011; Pavlenko 2005, 2011), we will seek to keep track of the current participants' linguistic trajectories with the intention to explore whether their experience with English has exerted any influence on their linguistic and non-linguistic behavior with motion endpoints.

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3 It should be noted that the focus of the present paper is on Afrikaans, and data on English and Swedish will be used for comparative purposes primarily. The reader is referred to Athanasopoulos and Bylund (2013) for a more detailed report on linguistic and non-linguistic motion event cognition in English and Swedish.

3 Method

In what follows we present the participants, procedure, and material used for each of the two experiments reported in the study.

3.1 Linguistic endpoint encoding of goal-oriented motion events

3.1.1 Participants

A total of 60 individuals took part in the linguistic construal task. These individuals were distributed across three different language groups: Afrikaans, English, and Swedish. The Afrikaans language group comprised 20 speakers who had acquired Afrikaans as L1 from birth. These individuals, who were university students in their mid-twenties, were born and raised in Coloured families in the neighboring towns (the Boland and Klein Karoo areas) of Cape Town, South Africa.[4] Since English is the medium of instruction of most South African tertiary education, the participants used this language on a daily basis. The average age of acquisition of English was 7.3 (*SD* 3.06). When asked to rate their proficiency with English on a 5-point Likert scale (where 1 represented 'Rudimentary' and 5 'Excellent'), these individuals reported an average proficiency of 3.30 (*SD* .80). Their everyday use of English was on average 3.70 (*SD* .73) (1 = seldom; 5 = very often).

Twenty English native speakers and 20 Swedish native speakers constituted the reference groups against which Afrikaans event endpoint encoding was compared. The participants in these groups were university students in their mid-twenties from north-west England and Greater Stockholm, respectively.

All participants received a monetary reward in appreciation for their involvement.

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4 Given the participants' ethnic background, one may be inclined to assume that they spoke Kaaps-Afrikaans. We do, however, wish to underline that it is not the aim of the present study to examine or establish Afrikaans dialectal variation, nor do we have sufficient heterogeneity in our participant groups as to address such issues. Apart from the general description that the Kaaps variety exhibit English lexical influence, more precise definitions of the linguistic characteristics of this variety are largely lacking to date. We therefore limit our observation in this regard to the remark that the current participants did not exhibit any English loanwords in their speech, nor did they exhibit any phonological features typically associated with Kaaps, such as the affricatization of /j/. The same holds for the participants described in 3.2.

3.1.2 Materials

Twelve video clips showing goal-oriented motion events were used to elicit linguistic endpoint encodings (see Athanasopoulos and Bylund in press). The clips had been prepared and compiled by the research team of C. von Stutterheim, M. Carroll and B. Schmiedtovà at the University of Heidelberg, Germany, and were used previously in, for example, Schmiedtovà et al. (2011), Carroll et al. (2004), and Bylund (2008, 2009).[5] The video clips contained scenes showing an entity (e.g., a vehicle or a person) moving along a trajectory at the end of which there was a possible endpoint (e.g., a house). The clips are categorized as having an intermediate degree of goal orientation, in the sense that the reaching of the endpoint was not overtly shown (Carroll n.d.). In addition, 6 video clips depicting a simple action that did not involve movement along a trajectory (e.g., a person type-writing) were used as fillers (see Appendix). All video clips were 6 seconds long.

3.1.3 Procedure

The participants were tested individually in a quiet room at a university in the relevant country. The test administrators told the participants that they would watch a series of video-clips showing everyday events on a computer screen. Specifically, they were asked to tell in their native language what was happening (Afrikaans: *Wat gebeur?*; English: *What is happening?*; Swedish: *Vad händer?*) in each scene as soon as they recognized the type of situation (cf. von Stutterheim and Nüse 2003).[6] Between each scene a purple background was shown followed by a star appearing in the center of the screen to indicate that a new event was about to start. The clips were presented in random orders. The participants' event descriptions were audio-recorded and transcribed for subsequent analysis. Locative phrases referring to the moving entity's arrival or intention to arrive at a goal were categorized as endpoint encodings (e.g., Eng.: *A man is walking <u>to a house</u>*; Afr.: *'n Man loop <u>na 'n huis</u>*; Sw.: *En man går <u>till ett hus</u>*).

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5 We are very grateful to the research team of C. von Stutterheim for providing us with their video clips.
6 Previous studies have demonstrated that phrasing the question as 'what happens?' elicits the same kind of responses in terms of endpoint encoding from English speaking participants as using the present progressive form ('what is happening'), (von Stutterheim and Nüse 2003; von Stutterheim et al. 2003).

3.2 Non-linguistic similarity judgments of goal-oriented motion events

3.2.1 Participants

A total of 53 individuals took part in the similarity judgment task. These individuals were distributed across three different language groups: Afrikaans, English, and Swedish. The Afrikaans language group comprised 19 speakers who had acquired Afrikaans from birth. These individuals were similar to the participants in the linguistic construal task, in the sense that they were Coloured university students in their mid-twenties, and had been born and raised in the Boland and Klein Karoo areas. Afrikaans was the only language spoken in their homes during their upbringing, and they had learnt English as a second language on the playground or in school. The participants' average age of English acquisition was 7 (*SD* 3.3), and their average use of this language was 3.85 (*SD* .81) (1 = seldom; 5 = very often). Their self-rated English proficiency was 3.55 (*SD* .89) (1 = Rudimentary, and 5 = Excellent).

Seventeen English native speakers and 17 Swedish native speakers constituted the reference groups against which Afrikaans endpoint preferences was compared. These participants were university students in their mid-twenties from north-west England and Greater Stockholm, respectively.

The participants received a monetary reward in return for their efforts. None of these participants had taken part in the linguistic encoding experiment described in section 3.1.

3.2.2 Material

Data on non-linguistic similarity judgment were elicited by means of a memory triads matching task. This task was the same as the one used in Athanasopoulos and Bylund (2013) and had been designed in the following way: Thirty-one video clips from the stimulus pool of the research group of von Stutterheim and associates (e.g., Carroll et al. 2003) were used in all permissible combinations to create 19 triads. Each triad consisted of a target and two alternates. The target clip was a scene with an intermediate degree of goal orientation. One type of alternate, the so-called [−*endpoint*] alternate, was a video with a low degree of goal orientation, that is, an entity moving along a trajectory without an obvious endpoint (for example a person cycling along a road). The other type of alternate, the so-called [+*endpoint*] alternate, was a scene with a high level of goal orientation. In these scenes, a moving entity that actually reached an endpoint was shown (for exam-

ple a person cycling into a garage). Triads were created (and clips edited where necessary) in such a way as to control for manner and direction of motion and number of agents. All clips were 6 seconds long.

3.2.3 Procedure

The participants were tested individually in a quiet room at a university in the relevant country. The test administrators informed the participants that they would see video clips arranged in triads on the computer screen, where clip A would appear first, then clip B, and finally clip X (the target). Participants were instructed to indicate whether they thought clip X was more similar to clip A or more similar to clip B. Thirty-eight triads were thus presented in an ABX format, where in a counter-balanced design within each participant half of the time the [–endpoint] alternate appeared first (clip A) and half of the time it appeared second (clip B), and vice versa for the [+endpoint] alternate. The precise sequence of the clips in each triad was as follows: Clip A played, followed by clip B, followed by clip X. Participants were instructed to give their responses only after they had watched clip X in its entirety. Clips played immediately after one another, with no pause in-between. Participants were given as much time as they liked to provide their judgment to the test administrator. After their judgment had been recorded by the test administrator, they proceeded to the next triad.

4 Results

4.1 Linguistic endpoint encoding of goal-oriented motion events

An analysis of the participants' event descriptions revealed that the Afrikaans speakers mentioned endpoints in 58.3 % (*SD* 17.7) of the scenes.[7] This number was closer to the Swedish average of endpoint encoding (61.7%, *SD* 14.2) than to the

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7 Biberauer and Folli (2004) made the observation that reference to boundary-crossing goal-oriented motion in Afrikaans may be ambiguous since it can have both a locative reading and a directed-motion reading (largely depending on the verb used). For instance, the sentence *sy hardloop in die bos* may be understood either as 'she runs in the forest' or 'she runs into the forest'. As the current experiment only comprises non-boundary crossing stimuli no such ambiguous sentences were produced by the participants.
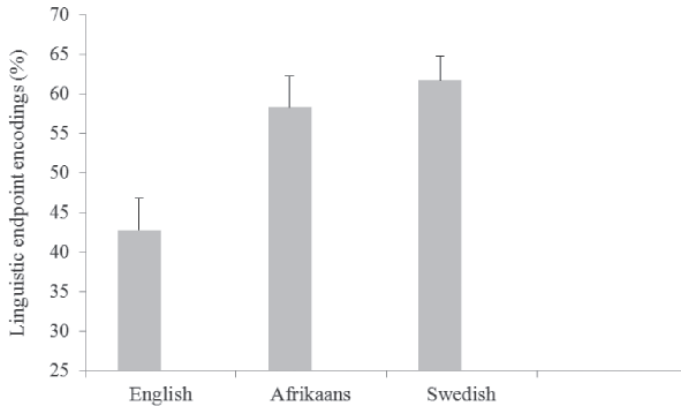
Fig. 1: Linguistic endpoint encoding frequencies.

English average (42.8%, *SD* 17.2). These findings are presented in Figure 1. A one-way ANOVA confirmed that there was a significant difference between groups, $F (2, 57) =$, 7.97 $p < .001$. More specifically, as revealed by post-hoc tests (Bonferroni), there was no statistically significant difference between Afrikaans and Swedish endpoint encoding frequencies ($p > .05$). Afrikaans and English endpoint frequencies did, however, differ significantly ($p < .01$). This difference was robust in terms of effect size, $d = .95$. Likewise, Swedish endpoint encoding frequencies were significantly different from the English ($p < .01$, $d = 1.26$). These results thus show that when confronted with a scene such as a woman walking towards a car, Afrikaans speakers were likely to make reference to an event endpoint, *'n vrou loop na 'n kar* ('a woman walks to a car'). This behavior was similar to that of the Swedish speakers, who described the same scene as *en kvinna går till en bil* ('a woman walks to a car'), but different from the English speakers' descriptions, which were often void of an endpoint, for example *a woman walking*.

The Afrikaans motion event descriptions were further inspected with regard to the occurrence of constructions used to convey ongoingness. The only construction found in the material was *besig om te* + VERB. This construction was used in a total of 4 occasions by three different speakers. Out of these 4 occurrences, 3 contained reference to an endpoint, for example: *'n Vrou is besig om na die speelpark te loop* ('a woman is walking to the playground'). On average, then, only 1.7 % of the Afrikaans speakers' motion event descriptions contained ongoingness markers. This pattern was similar to that found in the Swedish event retellings, in which only 3% of the events were described with an ongoingness construction (*ute och* + VERB, 'out and'), but fundamentally different from the English descriptions, where the progressive was used 100% of the time.

The next step in the analysis consisted in examining whether the participants' experience with English had an impact on their linguistic encoding of endpoints. Pearson correlations were consequently run between number of endpoints encoded and the variables Frequency of use of English, Self-estimated English proficiency, and Age of acquisition of English. The results are as follows: endpoint encoding and Use of English, $r = -.03$, $p > .05$; endpoint encoding and English proficiency, $r = -.22$, $p > .05$; endpoint encoding and Age of acquisition, $r = -.23$, $p > .05$. There were, in other words, no statistically significant correlations between the mentioning of endpoints and experience with English as defined in the current study.

4.2 Non-linguistic similarity judgments of goal-oriented motion events

For the similarity judgment task, the dependent variable was the amount of times the participants matched the target clip (X) with the [+endpoint] alternate (indicating an endpoint preference). All scores were consequently converted to percentages. The results showed that the Afrikaans speakers on average matched the target with an endpoint alternate in 36.4 % (*SD* 9.0) of the cases. This behavior was similar to that of the Swedish speakers, who exhibited a 37.2 % (*SD* 8.4) preference for endpoint alternates. The English speakers, in contrast, matched the target clips with endpoint alternates 24.8 % (*SD* 8.8) of the time (see Figure 2 for a visual representation of these findings). A one-way ANOVA revealed that there
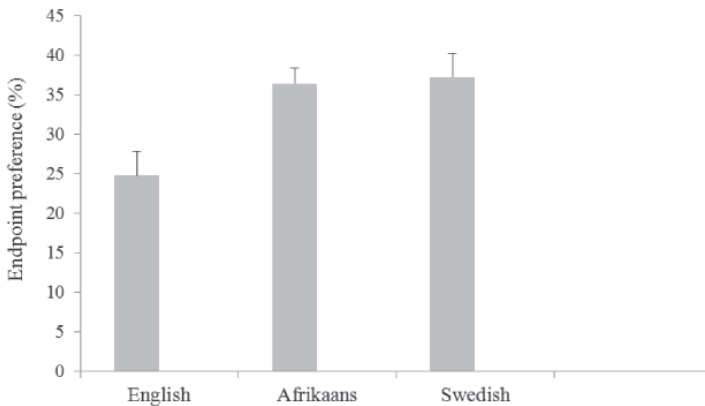

Fig. 2: Endpoint preferences in non-linguistic similarity judgements.

was a statistically significant difference between groups, $F(2, 50) = 11.40$, $p < .001$. Post-hoc comparisons (Bonferroni) confirmed that the Afrikaans pattern differed significantly from the English pattern ($p < .01$), but not from the Swedish pattern ($p > .05$). This difference exhibited a large effect size, $d = 1.16$. Swedish endpoint preference was significantly different from the English one ($p < .01$, $d = 1.54$).

A series of Pearson correlational tests was run in order to assess the possibility that the Afrikaans participants' behavior was influenced by their experience with the English language. Results showed virtually no correlation between endpoint preference and self-estimated English proficiency, $r = .08$, $p > .05$. Likewise, there was no statistically significant correlation between endpoint preference and Age of acquisition of English, $r = .29$, $p > .05$. However, a medium-strong and statistically significant negative correlation was found between Frequency of use of English and endpoint preference, $r = -51$, $p < .05$. This correlation thus suggests that those participants who spoke English more frequently were less prone to select endpoint alternates (thus resembling the pattern of English monolinguals), as opposed to those who used English less often (who in turn were closer to the pattern of the Swedish monolinguals).

To summarize, these findings show that when faced with the task of matching a scene depicting motion towards a possible goal, speakers of Afrikaans exhibited the same preference for endpoint alternates as did the Swedish speakers. In addition, it was documented that the degree to which the Afrikaans speakers selected the [+endpoint] alternate was negatively correlated with their daily use of English.

5 Discussion

5.1 Grammatical aspect and motion endpoint behavior

The principal aim of the current study was to extend research on motion event cognition and grammatical aspect to the Afrikaans language. In doing so, we sought to test the hypothesis put forth by von Stutterheim and colleagues (e.g., von Stutterheim and Carroll 2011; von Stutterheim and Nüse 2003) that speakers of languages that lack grammatical aspect are more prone to encode event endpoints than are speakers of aspect languages. The results corroborated this hypothesis on two different levels. First, it was found that when describing goal-oriented motion events, Afrikaans speakers exhibited an endpoint frequency that was on par with Swedish speakers', but significantly different from English speakers'. Second, it was documented that when judging the similarity of motion

events with different degrees of goal-orientation, Afrikaans speakers behaved, again, similar to Swedish speakers and different from English speakers.

What, then, are the specific mechanisms by which grammatical aspect influences motion event cognition? We suggest that this question can be answered by taking into account the notions of schematization and entrenchment. According to Langacker (1987, 2000, 2008), schematization is the process by which abstract commonalities are extracted from similar experiences. A schema thus serves a categorizing function, such that the speaker applies a given schema to new experiences that exhibit the same configuration as previous experiences. Temporal viewing frames, or more specifically, particular combinations of immediate temporal scope and maximal temporal scope, are subject to schematization. Over time, temporal viewing frame combinations become schematized in the mind of the speaker (Radden and Dirven 2008). It is generally assumed that the degree to which a given time schema comes to form part of a speaker's cognitive routine depends on the frequency with which that schema is activated (Langacker 2008): the higher the frequency of activation of a specific time schema, the more entrenched it will become in the mind of the speaker. Grammaticized markers of imperfectivity represent a prime example of a linguistic structure that leads to the entrenchment of immediate viewing frames. The grammatical category of aspect plays, in other words, an important role in determining the activation of a given time schema.

It is important to keep in mind, however, that aspectual morphology is not the only factor that triggers the schematization of temporal viewing frames. According to Langacker (2008), any kind of event construal made by the speaker has the possibility of becoming schematized in that speaker's mind. Thus, the fact that speakers of non-aspect languages occasionally resort to lexical or phrasal means to construe ongoingness, suggests that these speakers also have the possibility to access immediate viewing frame schemas (see further Bylund and Jarvis 2011). The crucial difference, then, between speakers of aspect languages and speakers of non-aspect languages resides in the *degree* of entrenchment of particular time schemas.

This reasoning dovetails with the current and previous findings, which show that behavior with motion endpoint reflects patterns of preference rather than absolute principles: speakers of non-aspect languages do not always encode endpoints, just as speakers of aspect languages do not always omit endpoints (for a similar reasoning, see von Stutterheim and Nüse 2003). In the absence of a linguistic structure that on an obligatory scale conveys imperfective aspect, Afrikaans speakers are more prone to adopt a holistic viewing frame of motion events. This is reflected, first, at a linguistic level, where they (in analogy with Swedish speakers) included the endpoint of the motion in their scene descriptions more

often than English speakers. It is also reflected in their non-linguistic behavior, by which they (again in analogy with Swedish speakers) more often matched the target scene with a [+endpoint] alternate than did the speakers of English. In sum, these findings show that immediate viewing frames are more salient and more likely to be accessed among speakers of aspect languages, than among speakers of non-aspect languages.

The reasoning above concerning schematization and entrenchment of time schemas provides us with an opportunity to discuss the dichotomy "aspect language vs. non-aspect language". In the current study, this distinction has been central for the purpose of categorizing languages as well as predicting speaker behavior. We do, however, think that this dichotomy deserves some problematization, as there may be a great deal of variation in the grammaticization of aspect within each language group that is not captured by the dichotomy. To begin with, in the group of aspect languages, the marking of aspectual contrasts varies considerably from one language to another. Compare, for instance, Sesotho, a Bantu language spoken in Southern Africa, which has no less than 18 aspectual categories (e.g., completive, continuative, persistive, permanent, habitual, and frequentative) (Nurse 2003) with English, which has only one aspectual category (i.e., the progressive). Even though both languages indeed have grammatical aspect, and are thus grouped together as "aspect languages", their individual aspectual systems are very different from each other. This state of affairs raises questions about to what extent the representation of time schemas differ among speakers of aspect languages, and crucially, whether such differences give rise to differences in event cognition.[8]

We also find intra-group variation among non-aspect languages, as these differ with regard to their repertoires of phrasal and lexical devices used to express aspectual contrasts. In fact, in some languages the use of such devices is

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8 An anonymous reviewer suggests that grammaticalized expressions of anteriority, such as the present perfect tense, may have an influence on motion endpoint behavior. The possible effects of the present perfect on the cognition of events in general, and motion endpoints in particular, is indeed a topic that to date has remained surprisingly unexplored in the cognitive sciences. The findings of the present study, however, seem to suggest, first, that speakers of English and Swedish encode endpoints to a different extent, despite the existence of and relative similarity between the present perfect tenses found in these languages. Second, the findings also show that speakers of Swedish and Afrikaans encode endpoints to a similar extent, in spite of the apparent differences in the use of the Swedish present perfect and the Afrikaans past tense (see Dahl 1985). It is possible, however, that an experimental study based on fine-grained, crosslinguistic analyses of different present perfect tenses could pinpoint differences in how speakers of different languages conceptualize events, and even motion endpoints. Clearly, this question is open to further research.

extensive. A case in point is Dutch, where the progressive construction *aan het* + INFINITIVE (literally 'at the') seems to be undergoing grammaticalization (Flecken 2011a, 2011b). This construction has been shown to be used extensively (around 50% of the time) in online retellings, depending on the semantic context. This can be contrasted with Spanish, which is typically classified as an aspect language. Even though Spanish has a progressive aspectual form, the use of this form is to a certain degree optional (Yllera 1999), and research has shown that the distribution between the simple present tense and the progressive is 60% to 40% in online retellings (Delucchi 2008; Sebastián and Slobin 1994). The main difference between the progressive forms in these languages is that the Dutch construction is still context-sensitive such that it is not (yet) combinable with motion verbs, whereas the Spanish progressive is. With Dutch and Spanish we thus have two languages that belong to different groups according to the aspect/non-aspect distinction, but in Dutch the use of progressive markers is similar to – or even greater than – the Spanish preference. The question is, then, whether there still is a difference in the degree to which restricted temporal viewing frames are entrenched and accessed in the minds of Dutch and Spanish speakers due to the fact that the Spanish progressive form is fully grammaticalized? Or, put more generally, is it the grammaticalization of an aspectual contrast or the frequency with which that contrast is expressed that gives rise to the entrenchment of particular temporal viewing frames?[9] To answer this question, it would be necessary to dissociate frequency from grammaticalization, which in and of itself may be challenging, as it is not unusual that the two are inextricably linked.

5.2 The effects of additional language learning on endpoint behavior

In addition to probing the hypothesis about the relationship between grammatical aspect and motion event endpoints, the current study also examined whether the Afrikaans speakers' experience with English exerted any effect on their endpoint behavior. The findings provided a mixed answer to this question. Whereas no significant relationship was documented between the mentioning of endpoints and English experience, non-linguistic endpoint preferences were shown

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9 Recent findings on Dutch show that the use of phrasal markers of ongoingness in event descriptions seems to correlate with attention allocation in a similar way as in English speakers (Flecken 2011a). This would thus suggest that the frequent use of phrasal (and lexical) aspectual markers may give rise to the same cognitive behavior as grammaticized markers, at least during speech production.

to correlate negatively with frequency of use of English. This result thus suggests that the more often the participants spoke English, the more they behaved like English speakers on the similarity judgment task, that is, matching more frequently the target scene with the [–endpoint] alternate. It is, however, not entirely clear why the influence of English on endpoint behavior did not extend to linguistic construal, but was limited to non-linguistic preferences. One possibility is that in the domain of motion events, second language influence on the native language is most visible in non-verbal behavior. This result is slightly reminiscent of Brown and Gullberg's (2008) findings on gesture and description of motion in Japanese second language learners of English (note, however, that their study concerns conceptual representations as elicited through speech production). In Brown and Gullberg's study, it was found that whereas the learners' motion event descriptions in Japanese did not deviate from monolingual patterns, their gesture did. Interestingly, Brown and Gullberg (2008) found a shift towards the second language gesture pattern even in bilinguals who had never lived in an English-speaking country before, showing that language experience alone is sufficient to trigger changes in conceptualization and conceptual representation. These findings thus suggest that the learners' representation of motion had changed as a result additional language learning, but that this change was not visible in their speech, only in their gesture.[10]

Leaving aside the question about differential L2 effects depending on L1 behavior, the current and previous findings seem to indicate that the cognitive system of the bilingual mind is tightly linked to use of specific linguistic features. For example, Flecken (2011a) investigated effects of ongoingness constructions on encoding in early bilingual speakers of Dutch and German (German lacks the progressive structure which was described for Dutch above). In addition to verbal descriptions (as employed in the current and previous studies), Flecken (2011a) recorded the bilinguals' eye movements with eye-tracking equipment before and during the description task in order to study their planning and organization of content that was going to be expressed. The results showed that bilinguals displayed patterns of language use that were dissimilar to either monolingual norm. Specifically, these early bilinguals frequently used the progressive form in Dutch, but they also tended to combine progressive aspect with the mention of end-

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10 Admittedly, another reason why the current study did not document any L2 effects in the linguistic encoding of endpoints relates to the issue of statistical power. It is possible that a large-scale study that had set out to test this question in particular might have yielded different results. Since it was not the primary aim of the current study to provide an answer to this particular problem of differential bilingualism effects in different endpoint behaviors, we leave this question open for future inquiry.

points, a combination that is not usually found in monolingual Dutch speakers. Crucially, the eye-tracking analysis demonstrated that bilinguals tended to look earlier and for longer periods to the action than to the agent of the event, and this correlated with a high frequency of use of progressive forms, showing that there is a tight link between frequency of use of specific linguistic features and attention allocation to specific aspects of a dynamic event.

We believe that our and previous findings of second language influence on cognition really illustrates the importance of controlling for bilingualism effects when investigating language-specific cognitive behavior. In several studies in the past on language and cognition, the participants' bilingual trajectories have either been ignored or dismissed as non-significant (Berlin and Kay 1969; Munnich et al. 2001; Loucks and Pederson, 2010; see Pavlenko 2005 for a general discussion). For example, in their study on spatial cognition in Korean and English, Munnich et al. (2001) engaged Korean adult native speakers who were living and studying in the US at the time of testing. The potential effects of these participants' English knowledge on their spatial cognition were dismissed because their onset of English acquisition was past the critical period (>13 years of age), and they could therefore be assumed to be non-nativelike. Leaving aside the controversy that still surrounds the Critical Period Hypothesis, this kind of reasoning shoots beside the target, because the issue at stake is not whether the participants were nativelike or not in English, but whether the English they had acquired, and the fact that they most likely used English on a daily basis, had exerted any influence on their Korean cognitive patterns (see Pavlenko 2005). In view of recent research showing that even intermediate levels of L2 proficiency may influence L1 behavior (van Assche et al. 2009; Brown and Gullberg 2008), it cannot be discarded that the Korean speakers' patterns of spatial cognition had been influenced by English.

It thus seems clear that the study of language diversity and cognition benefits from assessing potential bilingualism effects on language-specific cognitive behavior. For instance, if a study does not document any cognitive differences between English speakers and speakers of another language who are also proficient in English, it is difficult to know whether such result should be interpreted as evidence of universality, or whether it is an artifact of cognitive shift towards English patterns. In the present study, it was found that the Afrikaans speakers, in spite of being functionally bilingual, behaved differently from English speakers, but that the variation in the Afrikaans group to a certain extent could be explained taking in to account their frequency of use of English. It is thus possible that an Afrikaans-speaking group who have even greater exposure to English would behave differently, approximating English endpoint encoding preferences.

6 Conclusion

In this study we set out to examine motion event cognition in Afrikaans. Based on previous research on the relationship between grammatical aspect and the construal of goal-oriented motion, as well as the fact that the Afrikaans language lacks grammaticized imperfective aspect, we predicted that Afrikaans endpoint behavior would pattern with Swedish (non-aspect language) and differ from English (aspect language). The results confirmed the hypothesis. By extending the study of grammatical aspect and motion event cognition to the Afrikaans language, the current paper contributes to a growing body of evidence that demonstrates a relationship between grammatical aspect and language-specific behavior in the domain of motion endpoints. Crucially, the current findings suggest that the influence of grammatical aspect on endpoint encoding is not circumscribed to speech production only, but extends also to non-linguistic behavior. The fact that we found effects of second language (English) use on the non-linguistic similarity judgments adds a further dimension to these findings, showing that even though grammatical aspect may indeed induce a specific cognitive behavior, this behavior is not monolithic but can be restructured under the influence of a second language.

As a final remark, we conclude that even though the empirical evidence on a relationship between motion event construal and the category of aspect is steadily increasing, further research is needed to capture the complexity as well as the limits of this relationship. In discussing the findings, we raised questions about whether the variation within the aspect/non-aspect language groups as well as the overlap between them can give rise to, first, different behavior with goal-oriented motion events within each group, and second, similar behavior across groups. These questions are clearly open to future inquiry. Until empirical data have been provided they nevertheless serve to question and refine the theoretical apparatus that frames our understanding of the relationship between grammatical aspect and event cognition.

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Appendix. List of stimuli used in the linguistic encoding task

Action	Possible endpoints
Experimental stimuli:	
Person walking	a car, a house, some trees
Person riding bicycle	houses/a village, some trees
Person walking	a cafe, some chairs outside
Car driving on the road	some trees, buildings, a petrol station
Person walking	a nearby outdoor market
Person walking	cars parked nearby
Two people walking	some houses in the distance
Person running	the bank of a river, the river, some trees
Two people walking	a house, some trees
Two people walking	a playground
Car driving on the road	a petrol station, a railway crossing, some trees
Person riding a bicycle	several shops
Fillers:	
Person drinking coffee	N/A
Person waking up	N/A
Person shaving	N/A
Person playing the piano	N/A
Person peeling potatoes	N/A
Person typing	N/A