

When bilinguals forget their manners. Language dominance and motion event descriptions in French and German —————

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Abstract

The study of motion verbs has yielded evidence for typological differences among the languages of the world. Whereas in some languages, such as French or Spanish, the path of motion is mapped onto the verb, the typical motion verb in languages such as English or German expresses the manner of motion. However, these distinctions suggest not categories, but rather clines. Moreover, there is considerable intra-language variation. In this paper, an attempt is made to investigate the question whether bilingualism and more specifically the dominance relationship between the bilinguals' languages explain variation in motion event descriptions.

Motion event descriptions in German and French were elicited. The data from 172 participants describing self-propelled motion in space are analyzed. Inferential statistical analyses show that the number of manner verbs used in the German data rises with increasing German dominance of the speaker. No effects of dominance are found in French. Moreover, the combination of finite manner verbs with the predication of boundary-crossing in both languages co-varies with language dominance: the more German is dominant in the repertoire, the more this combination can be observed.

Keywords: motion events, bilingualism, bilingual dominance, convergence, boundary-crossing constraint

Zusammenfassung

Die Sprachen der Welt zeigen unterschiedliche Muster in der Beschreibung von Bewegung. Während in einigen Sprachen, etwa Spanisch oder Französisch, der zurückgelegte Weg in einer typischen Bewegungsbeschreibung im finiten Verb ausgedrückt wird, drücken typische Verben in Sprachen wie Englisch und Deutsch oft die Art und Weise der Bewegung aus. Solche Unterschiede sind jedoch nicht kategorisch,

sondern es handelt sich um Tendenzen. Ausserdem findet man beträchtliche Variation innerhalb von Sprachen und Varietäten. Im vorliegenden Beitrag soll eine bisher nicht beschriebene Quelle der Variation genauer erforscht werden, nämlich Dominanzverhältnisse im Repertoire von zwei- oder mehrsprachigen Personen. Untersucht werden die Beschreibungen von Bewegungsereignissen von insgesamt 172 Studienteilnehmern. Inferenzstatistische Analysen der deutschsprachigen Beschreibungen zeigen, dass die Anzahl von Verben, die die Art der Bewegung beschreiben, mit zunehmender Dominanz des Deutschen im Repertoire steigt. Keine solchen Effekte finden sich in den französischsprachigen Daten. Eine vertiefende Analyse zeigt ausserdem, dass der Ausdruck der Art der Bewegung im finiten Verb in Kombination mit der Prädikation von räumlicher Grenzüberschreitung umso häufiger auftritt, je dominanter das Deutsche im Repertoire ist.

Keywords: Bewegungsereignisse, Bilingualismus, Dominanz, Konvergenz, boundary-crossing constraint

1. Manner of motion and the motion verb typology

There is a substantial body of research that investigates systematic differences across languages in motion descriptions (cf. Tesnière, 1969; Talmy, 1985; 2000: 221), either from a typological or from an acquisitional point of view. One dimension of variation is the syntactic or morphosyntactic locus onto which a particular type of conceptual content is preferentially mapped. Another dimension of analysis is the typical level of granularity of motion event descriptions found across different languages and speakers. One of the most often described patterns that involves both of these dimensions of variation is summarized in Slobin (2006): the expression of manner of motion, e.g. in finite verbs as in example 1, systematically co-varies with the unmarked lexicalization pattern used for the description of motion. If speakers of a given language or variety tend to use verbs that express path as an unmarked choice (examples 2, 3), the expression of manner is relatively unlikely. Languages that follow this pattern are termed verb-framed languages. On the other hand, languages that map the path onto particles outside the verb (including verb prefixes) are much more likely to express manner in the finite verb. These latter languages are termed satellite-framed languages (Talmy, 2000; Slobin, 2004; a third type, often labeled equipollently framed languages, is not relevant in our context). Example 3 illustrates the finding that speakers of languages that show a preference for the use of path verbs have other means available for adding manner to the clause (here in a participial adjunct, “*gérondif*”). However, the general pattern seems to be that manner is less frequently expressed in verb-framed languages.

- 1) eine Person windet sich aus einem Schlafsack
a person twists REFL out a sleeping bag
- 2) une personne sort du sac de couchage
a person exits from-the sleeping bag
- 3) une personne sort d'un sac de couchage en rampant
a person exits from- a sleeping bag crawling
- 4) die Person geht aus dem Schlafsack raus
the person goes out the sleeping bag out
- 5) jemand verlässt kriechend einen Schlafsack
somebody leaves crawling a sleeping bag

These examples, all drawn from the data set analyzed below, illustrate the fact that the locus of manner expression varies regarding the lexical element that expresses it in the clause. Manner, however, is not obligatorily expressed, as examples 2 and 4 show. Research both from typology (Wälchli, 2009; Wälchli, 2001) and dialectology and sociolinguistics (Berthele, 2004; Berthele, 2013; Spreafico, 2008; Ibarretxe-Antuñano and Hijazo-Gascón, 2012) shows that both languages and speakers vary in the expression of manner components (as well as other aspects of motion event semantics). Researchers working within Talmy's framework often operate with what I suggest to term the "empty slot attractor theory", i.e. the idea that in languages that do not typically use the finite verb slot for the expression of path, this slot almost obligatorily 'attracts' manner verbs. Empirical research, however, shows that there is no such automatic entailment, since the manner and the path domains are only weakly correlated (Wälchli, 2009; Berthele, 2013). Thus, path is expressed obligatorily and by definition in a motion event, whereas manner is an optional co-event, both in satellite- and in verb-framed languages.

1.1. Clines and correlations

Whereas scholars agree that manner of motion is expressed with very variable probabilities in motion clauses even within satellite-framed languages, the reasons for these differences remain largely unknown (see Berthele, 2013 for an attempt

to find predictors pertaining to features of the speakers and speech communities). Acquisition studies (both L1 and L2), on the other hand, unavoidably have to deal with the variable nature of the phenomena in the scope of the typology (Larrañaga et al., 2012; Cadierno and Ruiz, 2006; Hendriks and Hickmann, 2011; Hickmann and Hendriks, 2010; Brown and Gullberg, 2010; Brown, 2013; Pavlenko and Jarvis, 2002; Alonso, 2015). In most of these studies, monolingual adult patterns serve as baselines and the subjects' production data are described as moving towards the patterns of the target language or as moving away from a pattern associated with the respective first languages.

This paper attempts to shed some new light on a potential source of variation that has received little attention from cognitive linguists. Since, as is often claimed in the literature (see e.g. de Bot, 1992), a majority of the world's population are bi- or multilingual, it seems reasonable to take the individual multilingual repertoire into account in exploring the variation in motion event descriptions. For example, as shown in Berthele (2013), the proportion of manner verbs out of the total number of motion verbs in Frog Story narratives ranges between 5% and 65% in native speakers of Swiss German varieties. Although some variance can be explained by modelling the impact of educational and other external variables, there is still an important amount of variation that remains unexplained. As I will argue here, the individual multilingual repertoire, and more specifically the dominance configurations within bilinguals who are proficient in both a satellite- and a verb-framed language, is a potential factor influencing these divergent usage patterns.

1.2. *Convergence*

In bilingualism research, since the seminal work carried out by Weinreich (1953), there is a broad consensus that bilinguals, in particular in contexts that lack a strong normative language culture, tend to establish correspondences between their two language systems which can lead to behavioral patterns that differ from those of monolingual reference groups. One of the often observed consequences of this inter-lingual identification is convergence of usage patterns in the two languages. There is some disagreement in the literature (Bullock and Toribio, 2004; Backus, 2004; Treffers-Daller and Mougeon, 2005) as to whether the term 'convergence' covers only phenomena that imply no violation of monolingual norms, i.e. that refer to similarity between the two languages of the bilingual based on optional choices that are genuinely grammatical or in line with native-speaker norms in one or both languages. In the domain of motion events, for example, a bilingual with German and French in her repertoire can increase the frequency of manner verbs in French of the type given in examples 6 and 7, and consequently the usage pattern ascends on the

manner expression cline in French. This increase leads to a pattern that converges towards what is considered ‘normal’ for German without violating the grammar of French. On the other hand, a bilingual may increase the use of path verbs in German (10), again in a perfectly grammatical way, which can lead to increased similarity with what is considered the French pattern.

- 6) le chat marche le long du mur
the cat walks along the wall
- 7) elle rampe en sortant de son sac de couchage
she crawls while exiting of her sleeping bag
- 8) quelqu’un se glisse hors de son sac de couchage
somebody REFL glides out of his sleeping bag
- 9) elle rampe en dehors du sac de couchage
she crawls out of-the sleeping bag
- 10) eine Frau überquert verkehrt eine Strasse
a woman crosses backward a street

Other authors also include phenomena traditionally described as interferences (Weinreich, 1953) or negative transfer (Odlin, 1989) in the category of convergence. As an example from our domain, again, the use of a manner verb in French for the crossing of a boundary (9) is generally considered ungrammatical or at least odd (see discussion below, section 3.3).

Second language acquisition and convergence in the framing of motion events was investigated by different scholars (see references cited above), sometimes with mixed results regarding the influence of L1 and L2 respectively. The upshot, however, seems to be that influence is possible both from L1 onto L2 and from L2 to L1 (bi-directional transfer, cf. Pavlenko and Jarvis, 2002). The studies listed above compared groups, as for example of stay-abroad Japanese L1 bilinguals in the US vs. English as a foreign language learning L1 speakers of Japanese in Japan (see Brown and Gullberg, 2013). In this paper, I suggest a somewhat different and, I hope, innovative approach, drawing on bilingualism research and the concept of dominance (Dunn and Fox Tree, 2009). Instead of comparing groups with different linguistic profiles,

the main goal here is to factor in the balance of the two languages in the repertoire as a continuous predictor of the framing patterns. There are different ways of assessing the dominance relationships within the bi- or multilingual repertoire, ranging from measures of vocabulary size or utterance length (Yip and Matthews, 2006) to self-assessment (Bedore et al., 2012; Flege, Mackay and Piske, 2002). Language dominance, from a usage-based perspective, is an important aspect since it is a correlate of usage frequency of languages and of constructions, and the entrenchment of constructional patterns in the bilinguals' mind is a function of the relative weight of the bilinguals' languages in the repertoire.

In order to assess the relative dominance of the languages in the bilingual repertoire, I use the Bilingual Dominance Scale (BDS) that was developed and empirically validated by Dunn and Fox Tree (2009). BDS is based on 12 questions regarding the personal language usage history as well as usage patterns of the two languages at the time of data collection.

1.3. *Boundary-crossing constraint*

An aspect that merits particular attention here is the linguistic framing of motion events that contain the crossing of a boundary (e.g. entering into a container/house, but also crossing a boundary separating two open spaces, etc.). This subcase of motion events is important since, as opposed to other cases in which speakers of satellite- and verb-framed languages can show similar or identical framing patterns, there seem to be robust constraints on the selection of manner verbs in these cases in many verb-framed languages. As illustrated by the examples 2 and 3 above, French and other verb-framed languages restrict the use of manner verbs: "It appears that verb-framed languages only license the use of a manner verb as a main verb in a path expression if no boundary crossing is predicated". (Slobin, 2006: 67).

There are exceptions to this rule, in particular if manner is in the foreground of the predication, as in example 11.

11) *une femme saute dans la piscine*

a woman jumps into the pool

12) *ein Mädchen springt, vollständig angekleidet, in ein Schwimmbecken*

a girl jumps fully dressed into a pool

Slobin explains that when high energy motor patterns are involved, manner verbs can “occur with boundary crossing in verb-framed languages” (Slobin 2006: 67). Similar observations with respect to the constraints on the combination of manner verbs with specific events are made by Stringer (2012) and Pourcel (2004). As shown by Alonso (2015), speakers of languages that underlie this constraint show transfer effects in their second language. The aim of the present study is to shed light on the effect of bilingualism on the description of boundary crossing.

1.4. Research Questions of this study

Based on the short overview of the literature above I formulate here a list of research questions that are addressed in this paper. There is an overarching question that can be spelled out in three subordinate questions (a, b, c):

To what extent do dominance relationships within the bilingual repertoire have an impact on the expression of manner or path in the verb slot of French and German descriptions of motion events?

This general research question must be explored in relation to at least three constituent questions in order to test the hypotheses entailed by the theoretical assumptions:

- a) Does the speakers’ use of manner verbs in both German and French increase as German becomes more dominant and decrease as French becomes more dominant?
- b) Does the speakers’ use of path verbs in both German and French increase as French becomes more dominant and decrease as German becomes more dominant?
- c) Do bilinguals speaking French violate the boundary-crossing constraint (BCC) more often as their German becomes more dominant; and do bilinguals when speaking German tend to refrain from combining finite manner verbs with boundary-crossing predication with increasing French dominance?

In order to tackle these questions, data from bilinguals in French and German were collected. The participants were asked to describe short video clips that show motion events (see section 2 for more details on the data). Both French and German data were transcribed and coded following the same procedures. The analyses of these data here provide descriptive statistics of the patterns found in the French and in the

German samples; a discussion of typical and noticeable examples drawn from the set of responses then follows. The main focus of this article lies in the inferential statistical analysis of manner verb and path verb usages (sections 3.1 and 3.2) as well as the co-occurrence of manner verbs with boundary-crossing predication (section 3.3). The results are summed up and discussed in section 4.

2. The Study

2.1. Participants

The data in all the examples used above as well as the analyses below stem from a sample of 172 subjects (116 women, 76 men; mean age 28.6). A large majority of the participants hold at least A-levels; most of them have a University bachelor's degree. A subgroup of this sample (20 informants) participated twice in the data collection, once responding in French and once responding in German (with at least 3 weeks of time lag between the two data collection sessions). Thus, there is a total of 192 response sets, 96 in German, 96 in French. The within-subject analysis of the 20 subjects who responded once in each of their two languages is not part of this paper, due to limitations of space. 150 participants are residents of Switzerland, 22 live in France (the Lyon area).

2.2. Questionnaire and bilingual dominance scale

The participants filled in a short questionnaire regarding their personal multilingual profile containing questions about mother tongue, language proficiency in their second and foreign languages, and most importantly 12 items based on the questions suggested by Dunn and Fox Tree (2009) that allow calculating the bilingual dominance scale (BDS). The more a score is negative (min=-30), the more an individual is French dominant. And, conversely, the higher the score (max=30), the more German dominant the participant. The scores for BDS were calculated according to the model in Dunn and Fox Tree, in a way that causes balanced bilinguals to score around 0.

2.3. Production task

All subjects were presented with 27 live video clips showing a wide variety of motion events. All clips but one feature a human figure (one clip shows a cat). For each stimulus, the instruction was to respond to the question "What is happening?"

(in French, “*Que se passe-t-il ?*”, in German « *Was passiert ?* »). Two training items were used to make sure the participants understood the task.

12 video stimuli were identical to those used by Naigles et al. (1998), 15 stimuli were newly produced. 17 of these stimuli depict clear cases of boundary crossing events, i.e. the moving human figure enters or exits a building, walks across a path, etc. A few stimuli show complex events, e.g. a person climbing over and through a barrier or a person stepping across a chain and then walking across a street.

The basis for the analyses is 96 response sets in German and 96 response sets in French (see 2.1) elicited using these 27 video clips in two randomly assigned orders. In some cases, participants either produced no description for a particular stimulus, or they produced descriptions lacking essential components, such as verbs. Despite the instruction to describe «what is happening», some informants respond giving descriptions and evaluations that do not contain reference to motion in space (“I don’t like his pyjamas” for a person twirling out of a building). Such non-motional responses were discarded for the analyses. After elimination of such unusable answers, the total number of valid responses is 2588 in French, and 2576 in German.

2.4. Data coding

Each response item was coded for several criteria (# of clauses, # of finite manner of motion verbs used, # of finite path verbs used). For the subset of stimuli featuring an event that involves boundary crossing of the figure (BC), a binary code for the presence or absence of BC predication in the response was added.

A first pass of coding of the verb types was made by at least one member of a group of students of the Fribourg MA program in multilingualism. In a second pass, the author of this paper coded every item again. The inter-rater reliability between the student’s and the author’s codings of finite path and manner verbs in the responses was high (Cohen’s Kappa between 0.81 and 0.82). In cases of disagreement, the author’s codings were used. Responses featuring several coordinate main clauses (see examples 32 or 33 below) were used for the qualitative analyses, but they were excluded from the statistical analyses, since the main point of the typological predictions discussed above concerns the integration of different semantic aspects into a single motion clause. Based on these codings, different analyses are possible, both on the level of individual stimuli and on the level of individual participants.

2.5. A first look at the dependent and independent variables

For all three dependent variables there are clear differences between the two languages analyzed: French responses clearly tend to contain fewer manner verbs (Figure 1a) and more path verbs (Figure 1b). Moreover, in French there are fewer combinations of manner verbs with boundary-crossing predication (German: 63%, French: 13%).

Figure 1 a, b: Proportions of manner and path verbs in the data

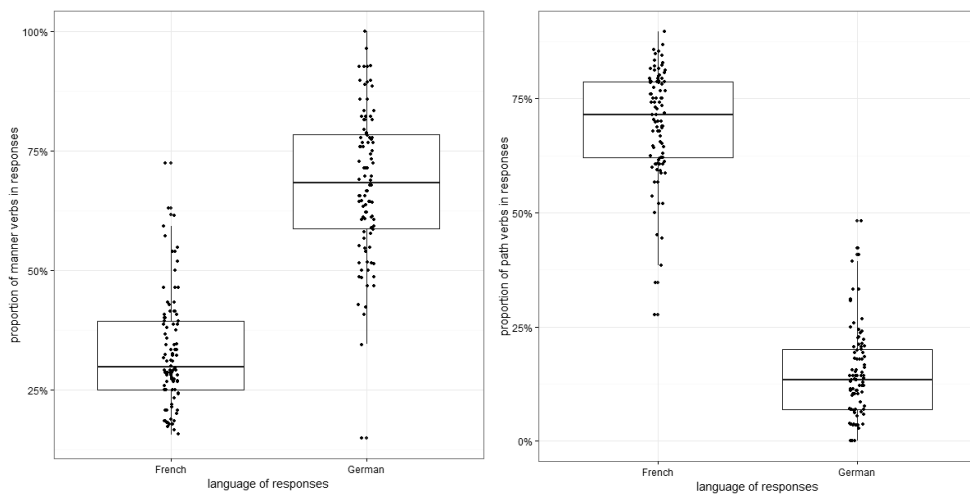
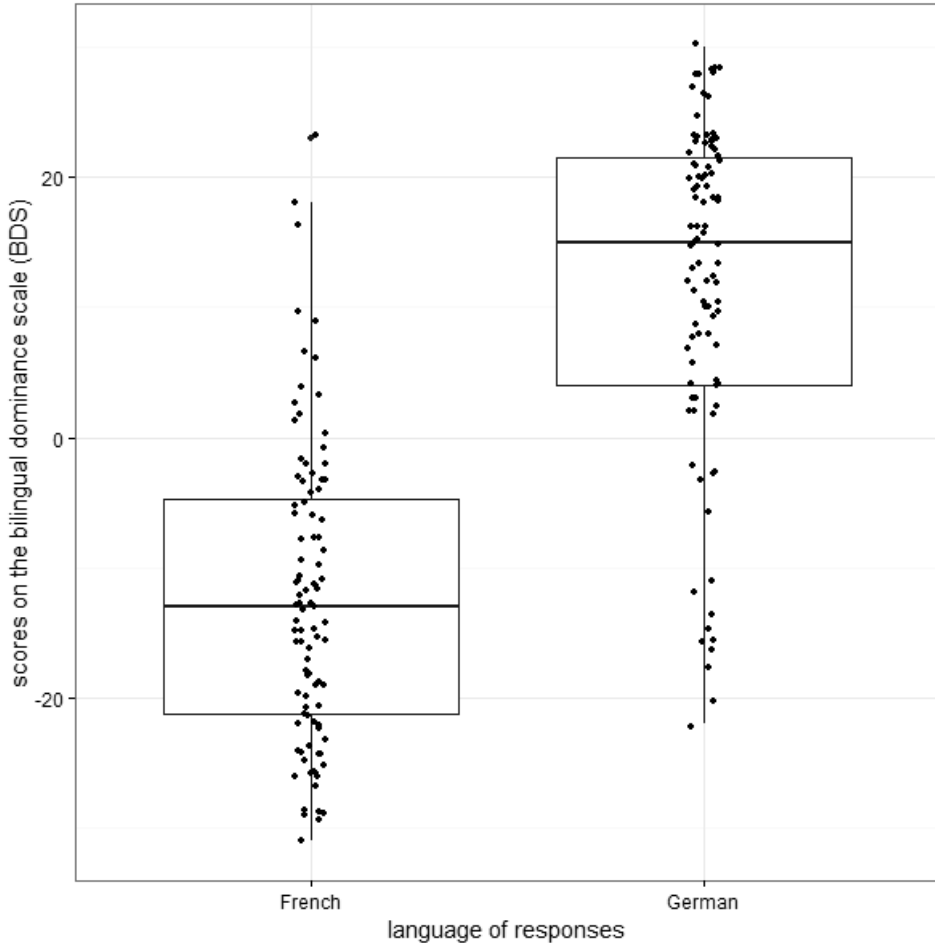


Figure 1 shows in both panels that there is considerable inter-subject variation within one language.

Figure 2 shows the distribution of the BDS scores in the two subsamples.

Figure 2: BDS-scores in the two subsamples



In the analyses below, I will attempt to assess to what extent the relative dominance of the languages in the repertoire affects the three dependent variables.

3. The influence of bilingual dominance on verb choice

The following analyses start by looking at response patterns for particular stimuli. In a second step, inferential statistics are used to test the hypothesis that bilingual dominance affects the participants' response patterns.

3.1. Manner verbs and BDS

As shown in Figure 1a), responses in German tend to contain more manner verbs. For some stimuli, the difference between the German and the French responses is quite striking. A case in point is the scene that shows a person galloping into an entrance. The descriptions of this video clip contain a finite manner verb in 74 out of 94 cases in German, whereas only 19 out of 93 responses contain a manner verb in French. As expected, most answers in French feature a path verb (*'entrer'*, see example 13), while manner is often expressed in a participial adjunct. If a manner verb is used in French, it is frequently the finite verb of a clause that predicates the manner of motion but not the path. This clause precedes a second clause expressing the event of entering (example 15). In some cases (e.g. 14), no boundary crossing is predicated at all, and in other cases (e.g. 16), the manner verb is the only finite verb and combines with the intended expression of boundary crossing. This last option yields a clear instance of violation of the boundary-crossing constraint (see section 3.3). These cases will be analyzed in more detail below.

13) quelqu'un entre dans un garage en faisant des pas chassés

somebody enters in a garage making sidesteps

14) elle fait des pas chassés

she makes sidesteps

15) une personne en tenue d'hiver court latéralement et rentre dans un portail ouvert

a person in dress of winter runs sidewise and enters in a doorway open

16) elle saute de côté avec les bras tendus dans la maison

she jumps sidewise with the arms open into the house

17) sie hüpf ins Haus

she hops into-the house

18) eine Person, die ihre Arme hoch auseinander hält, betritt seitwärts laufend ein Gebäude

a person who her arms up apart holds enters sidewise walking a building

Whereas the German responses overwhelmingly feature manner verbs, there are exceptions as in (18). This use of a finite path verb in German is not typical (but perfectly grammatical). The combination of a path verb with a manner participle looks strikingly similar to the French pattern that involves a gerund (“*gérondif*”), as in (13).

In other cases, e.g. the scene showing a girl jumping into a pool (see examples 11 and 12), French and German responses look very similar with respect to the manner verb uses (89 out of 95 responses with manner verbs in French and 88 out of 94 responses with manner verbs in German). Another stimulus that triggers manner verbs in French is the scene showing a man who is rolling down a slope.

19) *il se roule en bas la pente*

he REFL rolls down the slope

20) *une jeune fille descend un talus en roulant sur elle-même*

a girl descends a slope rolling on herself

21) *eine Person rollt einen Hügel herunter*

a person rolls a hill down

22) *jemand liegt auf dem Boden und bewegt sich,*

somebody lies on the ground and moves REFL

sich stets um die eigene Achse drehend, in einem Park nach unten

REFL always round the own axis turning, in a park downwards

‘*somebody lies in a park on the ground, moving down, while always turning around her own axis*’

In a minority of cases, both French and German speakers use other verbs to describe this scene (a path verb in 20 and a verb referring to unspecified motion (coding neither path nor manner) of the figure in 22).

Especially in the case of choices that do not fit in with the typological predictions, such as examples (16) and (22), we can hypothesize that being a bilingual who uses French and German regularly has an impact on the usage patterns. This hypothesis is tested using a logistic mixed effects model (see Table 1 and Table 2; the package used

is lme4, version 1.1 12, see Bates et al., 2015). The dependent variable in this model is the binary variable that codes whether the response contains a finite manner verb or not. This dependent variable is modelled in terms of three fixed effects and four random effects. The fixed effects are (a) language of response (French or German), (b) BDS score and (c) the interaction term between language and the BDS score. The latter term was included because we I hypothesize that language dominance affects response patterns in the two languages differently. The random effects were included in order to account for idiosyncratic by-stimulus and by-participant variability as well as to circumvent the assumption of traditional regression modelling that the data points be independent of one another. Specifically, random intercepts and random slopes for BDS are calculated in the model. As threshold for statistical significance I use the conventional $p=0.05$.

Table 1: Fixed effects on the probability of the choice of a manner verb in the response

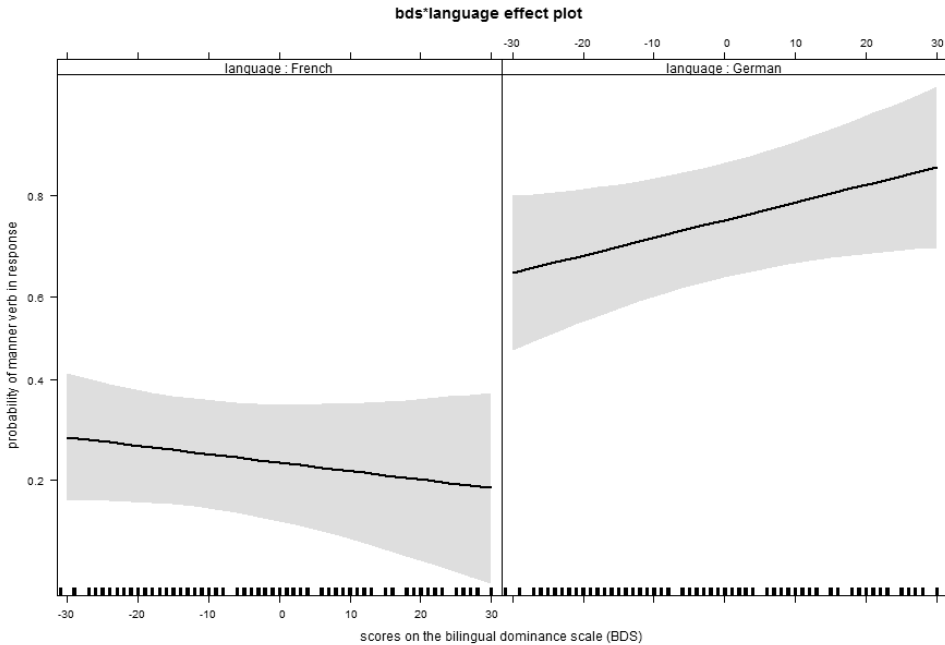
fixed effects	Estimate	\pm SE	p
intercept	-1.215	0.291	<0.001
bds	-0.008	0.009	=0.38
language of response is German	2.366	0.147	<0.001
bds:language of response is German	0.025	0.010	<0.05

Table 2: Random effect adjustments of the probability of selecting a manner verb

random effects	modelled standard deviation
random intercept by participant	0.672
random intercept by stimulus	1.365
random slope for bds by participant	0.027
random slope for bds by item	0.028

The intercept in Table 1 represents the predicted probability of 0.23 (transformed from log-odds) that a manner verb is chosen for a randomly chosen participant responding in French who is a balanced bilingual (bds=0). Model comparisons with alternative, simpler models (with fewer fixed and random effect terms) confirm that the model presented here has the best fit to the data. The model shows that, whereas the language of the response has the expected impact on the probability of the choice of a manner verb, there is no main effect for BDS. However, BDS interacts with the language of the response.

Figure 3: Effect plot of the probability of manner verb choice (model presented in Table 1).



The probability of selecting a manner verb in the German responses correlates positively with increasing dominance in German. We can therefore conclude that not only is there the expected impact of the language of the responses on the probability of manner verb selection, but also that bilingual dominance, in the German responses, has an impact on verb selection: the more dominant German is in the bilingual repertoire, the more likely the person is to use a manner verb. With increasing dominance of French, therefore, the likelihood of occurrence of a manner verb in the German response set decreases.

This result thus partially answers question a) listed above: Bilingual dominance relationships in fact do have an impact on the expression of manner in the verb slot. The expectation is only partially met because this relationship only holds for responses in German, not for those in French (the expected effect of BDS on the French responses is not found). BDS is not found to have a significant main effect in the model.

In this first analysis, I have tackled questions that are mutually related. Firstly, I have shown that the French and German responses indeed differ with respect to manner verb usage. Secondly, the individual repertoire, at least in the German subset, permits an explanation of variance that so far has been unaccounted for: the less the

speakers are dominant in German, the less they use manner of motion verbs. These analyses do not distinguish between stimuli such as those described in examples 19 and 21, where speakers in both languages predominantly chose manner verbs, and stimuli such as those in examples 13 and 17, where the response types in the two languages overall are rather different. After the analysis of the use of path verbs in the next section, I will therefore be focusing on the stimuli showing boundary crossing events. In relation to the literature review above it will be relevant to note whether there is variation in the violation of the boundary-crossing constraint, at least in the French data. Additionally, the question as to whether bilingual dominance configurations again play a role as a predictor will be answered.

3.2. Path verbs

By definition, the default in verb-framed languages is the choice of a verb that expresses path. In our French data, high-frequency verbs such as *sortir* ‘to exit’, *entrer* ‘to enter’, *descendre* ‘to go down’, *monter* ‘to go up’ are indeed often chosen by our informants (see e.g. examples 2, 13). German, unlike for example English, lacks path verbs derived from Latin (*to exit*, *to enter*). However, there are verbs that can be classified as path verbs (*verlassen* ‘to quit’, *betreten* ‘to enter’, *(über-)queren* ‘to cross’, see examples 5, 8, 14, 41, 42). If the typology distinguishing between path and manner verbs suggested by Talmy is taken as a reference point, a mirror image of the analysis in section 3.1 on manner verbs should emerge from the analysis of path verbs. We therefore expect the German of bilinguals with relative dominance of French in the repertoire to look more like French with respect to verb choice, i.e. they should show a higher propensity to use path verbs. The opposite should be the case in French, i.e. path verb frequencies should be lower with increasing dominance in German.

Table 3: Fixed effects on the probability of the choice of a path verb in the response

fixed effects	Estimate	±SE	P
intercept	1.399	0.296	<0.001
bds	0.011	0.010	=0.28
language of response is German	-4.236	0.190	<0.001
bds:language of response is German	-0.006	0.012	=0.64

Table 4: Random effect adjustments of the probability of selecting a path verb

random effects	modelled standard deviation
random intercept by participant	0.808
random intercept by stimulus	1.348
random slope for bds by participant	0.021
random slope for bds by item	0.026

The model parameters are given in Table 3 and Table 4. The intercept in Table 3 represents the predicted probability of 0.80 (transformed from log-odds) that a path verb is chosen for a randomly chosen participant responding in French who is a balanced bilingual (bds=0). The discussion of this model can remain very brief, since the fixed and the random effects in the model are identical to those discussed in section 3.1. The dependent variable here is the presence or absence of a path verb in the responses.

Only the language of the responses turns out to be a statistically significant predictor of the likelihood of using a path verb, with a substantially higher probability in French than in German. The bilingual dominance does not predict the probability of path verb usage, and unlike in the manner verb domain there is no interaction with the language of the response.

For the path verb use, the predictions formulated in section 1.4 are not met by the data. This result seems, at first sight, in contradiction to the result from the analysis of predictions concerning manner verb usage. I will discuss this apparent contradiction in section 4.

3.3. BCC violation and BDS

As illustrated in examples 13 and 17, stimuli that show a boundary-crossing event, such as a person galloping into a house, can yield different response patterns: rare use of manner verbs in French vs. systematic use of manner verbs in German. This pattern ties in with the assumption of a boundary-crossing constraint in French.

The goal of this section is to analyze the French and German data with respect to the description of boundary-crossing events. As a point of departure I take an agnostic stance as to whether there is such a thing as a boundary-crossing constraint in French or whether there is no such constraint in German. The data should first speak for themselves. In order to analyze the responses to the boundary-crossing stimuli, the

data were filtered and only the responses to the 17 stimuli that show boundary-crossing are examined. Each response was coded in one of three levels: either the response contains a finite manner verb and a boundary crossing predication, or it combines such a predication with a non-manner verb, or there is no predication of boundary-crossing at all in the response.

Table 5 shows the proportions of these three levels in the French and German responses to the two stimuli described in examples 23–30.

Table 5: Percentages of responses to two stimuli involving manner verbs (mV) or non-manner verbs (nmV) combined with boundary crossing predications (BC)

	German			French		
	mV + BC	nmV + BC	no BC	mV + BC	nmV + BC	no BC
gallop into house	71%	20%	9%	1%	77%	21%
jump into pool	97%	3%	0%	94%	6%	0%

23) une fille saute à pieds joints dans une piscine peu profonde

a girl jumps with joint feet into a pool little deep (=into a shallow pool)

24) eine Frau springt mit einem « Stängeler » in ein Bassin

a woman jumps with a "bar-like-jump" into a pool

25) eine Frau lässt sich in einen Pool stehend plumpsen

a woman lets REFL in a pool standing slump

The two stimuli trigger rather different response patterns. In line with Slobin (2006), a fast motion event in which the manner is salient, such as the one depicted in the stimulus that shows a person jumping into a pool, triggers the frequent choice of a manner verb both in French and in German. However, the probability of detecting a manner verb in the responses to the stimulus involving a figure galloping into a house is much lower in French than in German. The typical response here is one as (26) below. Moreover, there is a remarkably high proportion of responses that do not predicate the boundary-crossing event itself, as illustrated in examples (27) and (14).

Finally, as in examples (15) and (31), manner of motion verbs are combined with boundary-crossing predication in a small subset of French responses.

26) une femme entre dans un bâtiment à pas chassés

a woman enters in a building in sidesteps

27) quelqu'un sautille lateralement

somebody bounces laterally

28) eine Frau macht Pirouetten

a woman makes pirouettes

29) une femme sous la pluie sautille jusqu'à l'entrée d'un bâtiment

a woman under the rain bounces to the entrance of a building

30) eine Frau hüpfte seitwärts in ein Haus hinein

a woman jumps sideways in a house into

31) une femme sautille hors d'un garage

a woman bounces out of a garage

A large majority of French answers do not combine manner verbs and boundary-crossing predication in the same simple clause. Within this set of responses, there are constructional variants that allow speakers to express both manner and BC without violating a potential BCC. Examples 32–37 give an overview of these variants based on responses for entering and exiting events.

32) une personne en tenue d'hiver court latéralement et rentre dans un portail ouvert.

a person in dress of winter runs laterally and enters in a doorway open

33) une fille emmitouflée se déplace en pas chassés et rentre dans un garage

a girl wrapped-up REFL moves in sidesteps and enters in a garage

34) eine Frau springt und tritt in einem Gebäude ein

a woman jumps and goes in a building in

35) une fille fait un pas chassé pour entrer dans un bâtiment par la porte entrouverte

a girl makes a sidestep to enter in a building by the door half-open

36) un homme en pyjama sautille en rentrant chez lui

a man in pyjamas bounces entering his place

37) une fille tourne sur elle-même en sortant de l'église

a girl turns on herself exiting of the church

38) beim Herausgehen dreht sie sich

while exiting turns she REFL (=she turns around)

Examples (32) and (33) show parataxis. This allows the expression of manner of motion in the first clause and path of the boundary-crossing event in the second clause. Such responses were disregarded in the statistical analyses. Example (34) shows that this is also a possible solution in German. Example (35) illustrates the so-called “*infinitif de but*”, where the displacement is expressed via the infinitive of a path verb governed by the preposition *pour* (‘for’, ‘to’). Examples (36) and (37) show the solution of adding path information in a gerundive adjunct while expressing manner in the finite verb slot. Again, similar solutions are possible in German, as documented by example (38).

As shown in these examples, there is a rather large range of constructional alternatives both in French and German. This range provides speakers with different solutions that allow them to avoid conflicts with potential constraints regarding the co-occurrence of a finite manner verb and boundary-crossing predication in a simple clause. In the next step, this co-occurrence is again statistically tested. This is done using a similar model to the one discussed in section 3.1. The dependent variable here is a binary factor coding the simultaneous presence/absence of boundary-crossing predication and a finite manner of motion verb. Thus, both avoidance and alternative strategies that do not violate a possible BCC are all thrown together into the category ‘no’, whereas only the simultaneous use of a manner verb and a path phrase referring to boundary-crossing (cf. examples 30, 31) are coded with ‘yes’. Table 6 summarizes the

parameters of this model regarding the probability of such a ‘yes’ in log-odds. Table 7 shows the standard deviations of the random effects.

Table 6: Fixed effects on the probability of the co-occurrence of a manner verb and boundary-crossing predication in the response

fixed effects	Estimate	±SE	P
intercept	-2.747	0.541	<0.001
bds	0.034	0.012	<0.05
language of response is German	3.301	0.228	<0.001
bds:language of response is German	-0.008	0.014	=0.544

Table 7: Random effect adjustments of the probability of the co-occurrence of a manner verb and boundary-crossing predication

random effects	modelled standard deviation
random intercept by participant	0.847
random intercept by stimulus	2.076
random slope for bds by participant	NA
random slope for bds by item	NA

The intercept in Table 6 represents the predicted probability of 0.06 (transformed from log-odds) that a manner verb and BC-predication co-occur for a randomly chosen participant responding in French who is a balanced bilingual (bds=0). As the table shows, there are main effects both for BDS and for language. However, there is no interaction between language and BDS. This means that the effect of BDS is similar in German and in French.

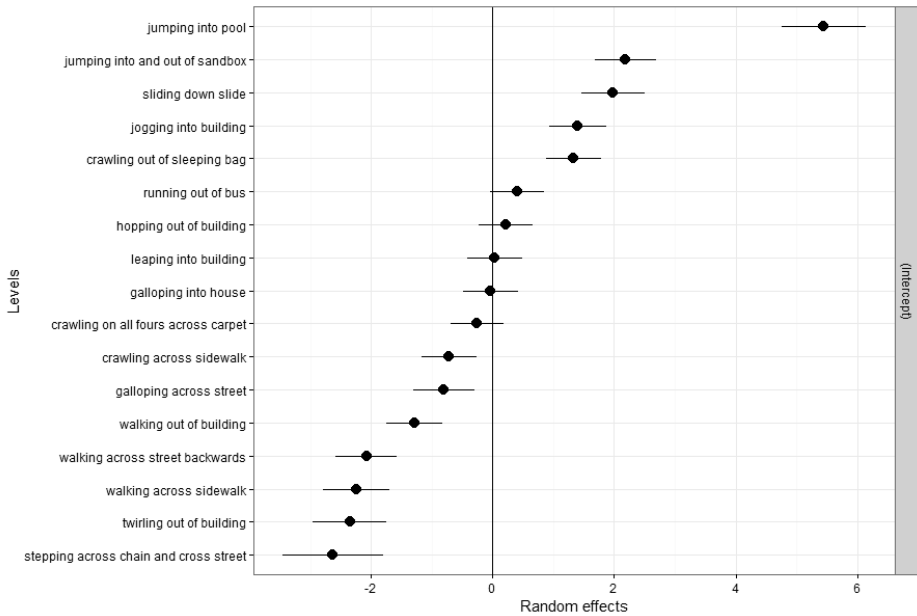
As expected, the likelihood of a violation of a potential BCC decreases with increasing dominance in French, and this effect can be detected regardless of the language that is being spoken in the responses. In addition, and again in line with expectations based on the literature review, manner verbs occur more frequently with boundary-crossing predicates in German than in French. However, in German, too, there is a tendency to use fewer manner verbs for the description of stimuli with boundary-crossing than for the other stimuli.

To summarize this analysis, we can conclude that, indeed, BDS and the relative dominance of French or German have an impact on the constructional alternatives

chosen by the speakers in the domain of boundary-crossing. The more French is dominant in the individual repertoire, the more the participant is likely to avoid the combination of a manner verb and boundary-crossing predication. This applies to both languages in our sample. However, the tendency to avoid the integration of a finite manner verb and BC-predication into a single clause is overall stronger in French. The answer to the question as to whether there is a boundary-crossing constraint in French or whether there is no such constraint in German is thus neither a yes nor a no: once again, we are confronted with a cline, i.e. changing probabilities that are conditioned not only by the language that is spoken, but also by other factors such as dominance relationships within the bilingual repertoire.

The use of mixed effect models allows a further exploration of the adjustments that are made both for individual participants and for the stimuli. As a useful example, Figure 4 shows the adjustments of the random intercepts for the different boundary-crossing scenes. These adjustments are extracted from the model underlying Table 7. Again, the high probability of a manner verb for the scene that shows a woman jumping into a pool is rather salient. Another stimulus with a jumping event shows a high probability of manner verb choice. This again confirms Slobin's observation, reported above, that abrupt motion events involving boundary-crossing may, even in verb-framed languages, be described with a manner verb. As Figure 4 shows, among the four stimuli with the highest positive adjustment (i.e. higher likelihood of combinations of manner verbs and BC predication) there are three stimuli involving jumping and sliding. Both involve rapid, punctual motion that is accelerated by gravity and therefore not entirely controlled by the self-propelled figure. In the scene "crawling out of sleeping bag" the manner of motion is extremely salient, since the clip shows during about 12 seconds a person making a considerable effort to wiggle herself out of a sleeping bag.

Figure 4: Random intercept adjustments per stimulus of the model presented in Tables 6 and 7.



Another look at Figure 4 shows that all ‘across’-stimuli require a negative correction of the probabilities of BCC violation. This is due to an increased probability of path verb usage for these stimuli, as is illustrated in examples (39)–(42).

39) un homme traverse un chemin dans un jardin

a man crosses a path in a garden

40) l’homme marche lentement dans le pré, il se tient bien droit et traverse le chemin

the man walks slowly in the field, he REFL keeps well erect and crosses the path

41) ein Mann überquert einen Fussweg

a man crosses a footpath

42) ein Mann geht über die Wiese und überquert einen Steinplattenweg.

a man goes across the lawn and crosses a stone path.

Er läuft mit fast gestreckten Beinen und Armen.

he walks with almost stretched legs and arms

On the one hand, this exploration of the random effects allows us to look for evidence in support of claims made in the literature, such as the variability regarding the boundary-crossing constraint discussed in Slobin (2006). On the other hand, the analysis of these adjustments permits the discovery of potential regularities that were not part of the initial expectations.

4. Discussion

Three statistical models are presented in this paper. Each of them tests one of the research questions laid out in section 1.4. Firstly, the probability of selecting a manner verb in the response was modelled as predicted by the language of the response, the participants' bilingual dominance configuration and the interaction of these two main effects. Manner verbs are clearly more frequent in the German responses, and in addition to this difference, within the German responses, the weight of French in the repertoire determines in a statistically significant way the likelihood of manner verb usage: the more a bilingual is dominant in German, the more manner verbs he or she will use in the description of the stimuli.

The frequency of the second type of motion verbs, the path verbs, turns out to be predicted by the choice of the language only, with higher frequencies in French than in German. No other model term seems to predict the frequency of path verbs in the responses.

The co-occurrence of manner verbs and the predication of boundary-crossing (i.e. potential candidates for the violation of the boundary-crossing constraint) is clearly more frequent in German and also dependent on the bilingual dominance: the more German-dominant a participant, the more likely he or she is to combine manner verbs and BC-predication. This holds both for German and French; there is no statistical interaction of BDS with the language of the responses.

The conclusions that emerge from these three analyses are therefore mixed: although in some respects the expectations formulated in the research questions are indeed met, in others they are not.

4.1. *Path and manner verbs as independent domains*

It is particularly striking that the analysis of the selection of path verbs does not show any impact of BDS. As discussed in section 1.1, scholars working in the tradition of Talmy's thinking often construct an either-or relationship between path and manner verbs: the verb slot is filled either by a path verb or by a manner verb. I have called this model the "empty slot attractor theory". The path and the manner verb analyses in this paper yield a somewhat more complicated picture: on the one hand, indeed, in the French responses, the verb slot is preferentially filled by a path verb and in the German responses by a manner verb. The manner verb domain, however, is subject to substantial variation both in German and in French. This variation does not seem to pattern as a systematic complement of the path verb domain: if this were the case, BDS should affect path verb selection in the opposite way to manner verb selection. The results discussed here, again, suggest at best a loose relationship between the two semantic domains manner and path (Wälchli, 2009; Berthele, 2013). What is crucial for the motion verb typology is that we understand that manner verbs are some sort of a 'nice but by no means obligatory' choice in the verb slot. Other verbs, such as rather generic ones (such as *come* and *go*) often fill the manner verb slot. I have argued elsewhere (Berthele, 2006; Berthele, 2013) that external factors such as the educational level of the informant or even the importance of orality or literacy in a speech community co-determine the verb repertoires used in spatial language data.

In addition to such factors, after analyzing the data presented in this paper, it seems that the individual bilingual repertoire in fact plays a role in the likelihood of a speaker's using manner verbs: the more dominant the satellite-framed language German in the repertoire, the more likely the choice of a manner verb in the German responses. However, as needs to be emphasized again, the absence of a manner verb by no means entails the presence of a path verb. Thus the manner domain is empirically rather disconnected from the path domain, the latter being obligatorily expressed by means either of a verb or of a particle, the former being optional.

Variation in the manner domain is therefore an interesting site that can be explored from the perspective of sociolinguistics and bilingualism research, as I have tried to do in this contribution. In the present contribution, I only focus on verbs. Further analyses, e.g. of the use of manner adjuncts, will allow more light to be shed on the whole manner domain.

4.2. Boundary-crossing: a probabilistic constraint in satellite- and verb-framed languages

The analysis of the boundary-crossing stimuli in this paper furthermore sheds some new light on the so-called ‘boundary-crossing constraint’: the dominance relationships within the individual language repertoire seems to have a measurable impact on the combination of finite manner verbs with boundary-crossing predication, both in German and in French. The constraint is thus a statistically measurable tendency to avoid the use of manner verbs when boundary-crossing is predicated. The reason participants responding in German are less reticent in combining manner verbs with BC predications could be morphosyntax: the richer morphosyntactic means in German systematically disambiguate between static and dynamic prepositional phrases. A manner verb with a PP with an accusative marker (as in example 44) makes it clear that the clause has a directional meaning, as opposed to the static example (45) with a dative marker. French does not offer such morphosyntactic means (cf. example 43). The combination of a manner verb with a PP is therefore ambiguous regarding the path; either no change of location is predicated and the PP refers to the space in which a particular manner co-event takes place, or the PP in fact refers to the goal of a boundary-crossing motion event.

43) un homme court dans une maison

a man runs in(to ?) the house

44) der Mann mit den violetten Kleidern rennt ins Haus

the man with the purple dress runs in-the:ACC house

45) er rennt im Haus

he runs in-the:DAT house

Despite the absence of this ambiguity of the PP in German, the data discussed still show a similar tendency to use alternative verbs in German, too, especially in the ‘across’-stimuli.

4.3. Methodological considerations

As I have shown in sections 3.1-3.3, there are statistical techniques that are inferential and exploratory at the same time: mixed effects models allow the testing of hypotheses and the exploration of additional, unexplained variation in the data.

They offer new ways of discovering and investigating variation, as is shown for the case of the random effect parameters per stimulus item in Figure 4. This exploration of the random effects by stimulus shows that, at least in our data, particular types of boundary-crossing paths, namely if the figure moves into a clearly delimited space, yield responses that contain path verbs more systematically than stimuli that show other subcategories of path. Why this is the case and if this regularity is borne out by other data and languages needs to be investigated in further empirical work.

5. Conclusion

Most scholars in the field of motion event research agree that the expression of manner in general and in particular in the finite motion verb slot varies and that languages can be located on a cline between a manner-salient and a manner-non-salient pole. Referring to ‘languages’ in this context, in my view, is a problematic practice: the locus of variation is not a ‘language’, but speakers’ choices. Speakers, both multilinguals and monolinguals, can be seen as representing one or several languages. However, it is crucial that reducing a language to a parameter, e.g. a mean probability of 0.8 of expressing manner in a finite motion verb in a given task, essentializes the ‘language’ in a problematic way: it is not languages that are characterized by these parameters, but populations of speakers carrying out specific tasks in specific contexts. Whether or not it is useful to generalize these parameters to all varieties, registers, styles, or even the ‘language’ as a whole is questionable. The higher the range of variation within subsamples, the less such a generalization makes sense. The statistical models used in this paper consider two types of variation: firstly, the individual repertoire, operationalized via the BDS scale, is used as a predictor of the dependent variables in the motion expression domain. Secondly, the models also take into account the fact that in addition to the variance explained by the fixed effects, individuals vary for reasons that are not yet completely understood. This individual variance, as shown in Figure 1, is considerable. Therefore, although there are statistically significant differences across languages regarding the model parameters, talking about French, or even worse, ‘Romance’ languages as being manner non-salient erases important variation within languages and language families.

The upshot of this article thus is that there are ways of going beyond the claim that ‘languages’ are located on clines regarding the usage patterns in motion verb research. By taking into account variables such as bilingual dominance as well as by exploring the structure of variation by stimulus, we can at the same time account for some of the variance in the data within ‘languages’. Ultimately, such analyses improve the theorization of the motion verb typology.

The boundary-crossing constraint turns out to be a probabilistic tendency. Moreover, it seems to affect speakers of languages that were not traditionally seen as subject to this constraint. As shown in the analyses, the strength of the constraint depends not only on the language of the response, but also on the individual dominance configuration of the bilingual repertoire. In addition to the clines across languages already acknowledged by many scholars in the field, the main point here is that we are dealing with continuous phenomena also within languages, with phenomena that should be seen as probabilistic in nature rather than categorical.

5.1. Questions for further research

There are several important questions that remain unanswered by the analyses presented here. Most importantly, it remains unclear why the French responses both in the manner and path verb domains seem to be largely immune to effects from the bilingual dominance configurations. Further research could explore whether it is cultural or linguistic factors (or both) that pre-empt more convergence in French. From the point of view of the learner and user, the 'French system' is convenient and relatively simple: a small set of highly frequent path verbs combined with directional PPs and, if needed at all, manner adverbials, covers most expressive needs. This dominant pattern appears to be so entrenched that it is much less likely to be restructured, even if the bilinguals or multilinguals master other languages that come with different preferential patterns. On the other hand, since manner verbs are a rather large and potentially open set of verbs, usage patterns in satellite-framed languages might be more sensitive to the impact of bilingualism and/or other external factors. The influence of dominance on manner verb selection in the German data could thus also be partially due to a smaller productive verb lexicon in the French dominant participants. Further investigations controlling for vocabulary size would therefore be needed to assess the influence of vocabulary size on manner verb use and boundary-crossing description.

Another explanation of the relative immunity to bilingualism in the French data could be a stronger normative attitude of speakers of French with respect to what is the correct way of describing motion in space, as opposed to the relatively loose and informal language norms especially in areas with considerable dialectal variation, as is traditionally the case in German-speaking Switzerland (see Weinreich, 1953). However, such a cultural theory of resistance to convergence would need support from other, similar bilingual contexts.

As a final remark I wish to emphasize that further research should certainly go beyond the approach chosen in this paper and explore more predictors as well as different conditions of language production. A new look at narrative conversational

data integrating measures of bilingual proficiency would certainly be relevant and interesting. Another question that is open for further exploration is the impact of bilingual or monolingual activation of the languages (e.g. drawing on Grosjean's (2001) idea of language modes) on the usage patterns investigated by motion event researchers.

Acknowledgements

I would like to thank the Fribourg graduate students who have helped collecting and coding the data analyzed in this paper (Lucia Aellen, Nina Bechtiger, Romaine Brunner, Sandra Bucheli, Susanne Christen, Eglantine Dousse, Kateryna Freiburghaus, Linda Hill, Sara Mürset, Anastasia Pustovit, Rebecca Schär, Ladina Stocker, and Lucie Stooss). Thanks also to Jan Vanhove, Elisabeth Dutton and Didier Maillat for their valuable comments on earlier versions of this article.

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