A semantic approach to auxiliary selection with German verbs of motion. An empirical study

Wojciech Lewandowski
University of Copenhagen
woj.lewandowski@gmail.com

Abstract

German manner-of-motion verbs can take both *haben* 'have' and *sein* 'be' as perfect auxiliaries. It has recently been proposed that, in these cases, auxiliary selection is determined by the feature [locomotion], where [+locomotion] triggers *sein* 'be' and [-locomotion] triggers *haben* 'have' (Randall 2007). In this paper, we explore the notion of locomotion from an empirical semantic perspective. We report the results of an acceptability judgment task and we show that some manner-of-motion verbs are more typically associated with [+locomotion] than others depending on the prominence of directionality involved in verb semantics. However, we argue that locomotion is not a property of verbs themselves but rather a property of constructions (Goldberg 1995), which impose a specific semantic construal on the verbs.

Keywords: auxiliary selection; German; manner-of-motion verbs; semantics; locomotion

Resum. *Un enfocament semàntic de la selecció d'auxiliar en els verbs de moviment de l'alemany. Un estudi empíric*

Els verbs de manera de moviment de l'alemany poden agafar *haben* 'haver' i *sein* 'ser' com a auxiliars de perfet. Recentment s'ha proposat que, en aquests casos, la selecció de l'auxiliar ve determinada pel tret [locomoció]: el marcatge positiu d'aquest tret activa l'ús de *sein* 'ser' i el negatiu implica l'ús de *haben* 'haver' (Randall 2007). En aquest treball explorem la noció de locomoció des d'una perspectiva semàntica. Exposem els resultats d'una prova de judici d'acceptabilitat i mostrem que alguns verbs de manera de moviment s'associen més típicament amb [+locomoció] que d'altres en funció de la prominència de la direccionalitat associada a la semàntica del verb. Tot i això, argumentem que la locomoció no és una propietat intrínseca dels verbs, sinó més aviat de les construccions (Goldberg 1995), que imposen una interpretació semàntica específica dels verbs.

Paraules clau: selecció d'auxiliar; alemany; verbs de manera de moviment; semàntica; locomoció

Table of Contents

1. Introduction

According to recent scholarly work, auxiliary selection with German motion verbs is determined by the feature [+ locomotion] (Randall 2007). Crucially, it has been proposed that path verbs (e.g., *arrive*; cf. Talmy 2000) as well as manner-of-motion verbs combined with path phrases, both telic and atelic (e.g., *dance into the room, dance around*), select for BE, while non-directional contexts (e.g., *dance on the table*) require the use of HAVE.

In this paper, we show, on the basis of an experimental task, that indeed [+locomotion] is highly relevant for auxiliary selection in German. However, not all manner-of-motion verbs behave in the same way. We suggest that it is important to distinguish between directional manner-of-motion verbs, i.e., those involving displacement (cf. Folli & Ramchand 2005), and non-directional manner-of-motion verbs (e.g., *laufen* 'run', *fliegen* 'fly' vs. *tanzen* 'dance', *schweben* 'float'). The results of our study show, in line with Randall's (2007) proposal, that both semantic classes combine with BE when accompanied by path phrases. However, when path is not overtly expressed, non-directional verbs tend to combine with HAVE, while verbs implying displacement are more likely to select BE. To the best of our knowledge, this semantic correlation has not yet been observed in previous scholarly work. Moreover, we provide evidence that although some verbs are typically associated with one or the other auxiliary, the feature [+locomotion] is not a matter of verb semantics itself, since some directional verbs can appear with HAVE when focus is placed on the activity rather than on displacement. Conversely, as is well-known, it is possible to impose a directional interpretation on non-directional motion verbs such as *tanzen* 'dance' by adding a path phrase. Hence, we conclude that the feature [+locomotion] is not a property of verbs but rather a property of constructions (Goldberg 1995) with which the verbs combine (cf. Rosemeyer 2014; Mateu & Massanell 2015).

This paper is organized as follows. Section 2 offers a general background for our study. First, we briefly introduce Sorace's (2000) Auxiliary Selection Hierarchy in order to situate our research in a broader context of variation in the choice of perfective auxiliary and then, we offer an overview of previous approaches to perfect formation with manner-of-motion verbs in German, paying special attention to Randall's (2007) notion of locomotion. Section 3 presents the findings of the present study: we formulate a hypothesis, describe the study's methodology and report the results. Concluding remarks are drawn in Section 4.

2. Background

2.1. *Sorace's Auxiliary Selection Hierarchy*

It has been claimed that in languages which exhibit alternation of perfect auxiliary verbs, HAVE occurs with transitives and unergatives, whereas unaccusatives combine with BE (Perlmutter 1978 and Burzio 1986). However, as is well-known, there is variation within and across languages. Sorace (2000) shows that this kind of variation is not a random matter. Roughly speaking, according to her

Table 1. Auxiliary Selection Hierarchy (Sorace 2000)

	Change of location
	Change of state
BE	Continuation of a pre-existing state
	Existence of state
	Uncontrolled process
	Controlled process (motion)
HAVE	Controlled process (non-motion)

Auxiliary Selection Hierarchy, verbs choose auxiliary verbs more or less categorically depending on the semantic class they belong to (see Table 1).

As Table 1 shows, inherently telic change-of-location verbs (core unaccusatives) and verbs of non-motional process (core unergatives) are consistent in their choice of BE and HAVE, respectively. By contrast, the intermediate verb classes exhibit cross- and intra-linguistic variation in auxiliary selection to different degrees. The Dutch, French, German and Italian sentences in (1)-(5), most of which are taken from Sorace (2000), exemplify this phenomenon.

Examples (1) and (2) illustrate that verbs such as 'arrive' (change-of-location) and 'work' (non-motional controlled process) categorially select BE and HAVE, respectively:

(1) a. Maria **è** venuta alla   festa.   (Italian)
         Maria is come   to the party
         'Maria came to the party.'

     b. Der Zug ist spät angekommen.   (German)
         the train is late arrived
         'The train arrived late.'

(2) a. Les policiers   ont travaillé toute la nuit.   (French)
         the policemen have worked whole the night
         'The policemen worked all night.'

     b. Kurt hat den ganzen Sonntag gearbeitet.   (German)
         Kurt has the whole Sunday worked
         'Kurt worked all day Sunday.'

Change-of-state verbs are less consistent in auxiliary selection. While inherently telic verbs such as 'die' or 'be born' tend to combine with BE, HAVE is not categorically rejected by other change-of-state verbs:

(3) a. De leraar   is plotseling gestorven.   (Dutch)
       the teacher is suddenly died
       'The teacher suddenly died.'

    b. Die Zwillinge sind im April geboren.   (German)
       the twins   are in April born
       'The twins were born in April.'

    c. Le livre est / a   paru   récemment.   (French)
       the book is   has appeared recently
       'The book recently appeared.'

Continuation-of-state verbs (e.g., 'last', 'continue') tend to select HAVE in German and Dutch but they typically combine with BE in Italian:

(4) a. Die Äpfel haben/*sind den ganzen Winter gehalten.   (German)
       the apples have   are the whole winter lasted
       'The apples lasted the whole winter.'

    b. Het concert heeft/??is een hele   tijd geduurd.   (Dutch)
       the concert has   is a   whole time lasted
       'The concert lasted a long time.'

    c. La guerra é / ?ha durato a   lungo.   (Italian)
       the war   is has lasted for long
       'The war lasted a long time.'

Existence-of-state verbs require BE in Italian, and typically HAVE in Dutch, French and German, although some variation has been attested:

(5) a. I   dinosauri sono esistiti / ??hanno esistito 65 milioni di anni fa.
                                                                (Italian)
       the dinosaurs are existed   have existed 65 millions of years ago
       'The dinosaurs existed 65 million years ago.'

    b. Het magische zwaard heeft echt   bestaan.   (Dutch)
       the magic   sword has   really existed
       'The magic sword really existed.'

While most uncontrolled processes are associated with HAVE in Dutch, French and German, they allow for variation in Italian:

(6) a. Der Zug hat laut   gerumpelt.   (Keller & Sorace 2003: 25) (German)
       the train has noisily rumbled
       'The train rumbled noisily.'

    b. Il tuono ha/ è rimbombato.   (Italian)
       the thunder has is rumbled
       'The thunder rumbled.'

Finally, manner-of-motion verbs are compatible with both BE and HAVE, but different languages apply different principles in the choice of the auxiliary verb; cf. (7a) and (7b):

(7) a. Maria ha corso/è corsa velocemente.   (Italian)
       Maria has run   is run   fast
       'Maria ran fast.'

    b. Marie a   couru/*est courue très vite.   (French)
       Marie has run   is   run   very fast
       'Marie ran very fast.'

After situating our object of study, that is, manner-of-motion verbs, in the broader context of semantic classes and cross-linguistic and intra-linguistic variation in auxiliary selection, in the next section we briefly introduce previous descriptive findings related to auxiliary choice with motion verbs in German, placing special focus on the notion of locomotion introduced by Randall (2007).

2.2. Manner-of-motion verbs in German: BE or HAVE?

One important dimension related to motion events is telicity (Comrie 1976; Smith 1997). Manner-of-motion verbs are capable of appearing in telic and atelic structures. Accompanied by a path phrase denoting transition from one point in space to another, manner verbs refer to a telic event. If the path phrase denotes a different kind of spatial relation or is absent at all, manner-of-motion verbs denote an atelic event; cf. (8) and (9):

(8) John ran to the room (in/*for 2 minutes)   (telic path)

(9) a. John ran around (for/*in 2 minutes).   (atelic path)

     b. John ran (for/*in 2 minutes).   (no path)

In previous stages of German, the choice of perfect auxiliary was determined by the aspectual nature of the motion event: BE was associated with telic events, and HAVE with atelic events (Sapp 2011). The same is true for contemporary Dutch (Hoekstra 1999; van Hout 2004: 75-78; Zaenen 2011):

(10) a. John is in five minuten naar de bus gelopen.   (telic path)
        John is in five minutes to   the bus walked
        'John walked to the bus within five minutes.'

(11) a. Het water heeft urenlang   langs de muren gelopen.   (atelic path)
        the water has   hours-long along the walls   walked
        'The water ran along the walls for hours.'

     b. John heeft de hele nacht gelopen.   (no path)
        John has   the wholenight walked
        'John walked all night.'

However, this principle does not hold for contemporary German, where manner-of-motion verbs show preference for BE even if the path is atelic (Randall 2007):

(12) a. Er ist ins   Zimmer getanzt.   (telic path)
        he is into.the room   danced
        'He danced into the room.'

     b. Er ist herumgetanzt.   (atelic path)
        he is around.danced
        'He danced around.'

In (12a), the prepositional phrase refers to the path "outside-inside", while in (12b) the directional particle *herum-* 'around' is atelic since one can move around and finish in the same place that she started (there is no new endpoint). In both cases, the use of BE is obligatory, which proves that auxiliary selection in German motion verbs is not sensitive to telicity.

Based on this fact, Randall (2007) proposes that what triggers the choice of BE in German is the feature [+locomotion], that is, motion involving displacement (see also Legendre 2007) rather than telicity. This idea has later been echoed by several researchers (e.g., McFadden 2007; Diedrichsen 2013; Gillmann 2015). However, although Randall (2007) formalizes and incorporates the dimension of locomotion in her theory of parametrized auxiliary selection, it is not totally clear how the feature [+locomotion] works in practical terms. As already mentioned, it is known from previous research that path specifications, telic or atelic, trigger BE. However, auxiliary selection with bare manner-of-motion verbs, i.e., without an overt path phrase, seems somehow confusing. In the first place, these kinds of structures do not exhibit uniform behavior. While some bare manner verbs show preference for HAVE (e.g., *tanzen* 'dance'; see Randall 2007), others are more likely to select BE (e.g., *laufen* 'run'; see Gillmann 2015).

(13) a. Er hat/ *ist getanzt.
        he has is   danced
        'He danced.'

     b. Er ist/??hat gelaufen.
        he is   has run
        'He ran.'

In the second place, scholarly work provides contradictory information. Some researchers state that German manner-of-motion verbs in general show a clear tendency towards BE even if path is not overtly elaborated (Keller & Sorace 2003; Gillmann 2015), whereas according to others, HAVE and BE are in free variation (Seibert 1993).

(14) Die Frau   ist/hat geschwommen.
     the woman is has   swum
     'The woman swam.'

Ironically enough, none if these statements are true for verbs such as *tanzen* 'dance' which selects HAVE. Given the lack of consensus in previous work, the research questions that immediately arise are the following ones: (i) Which manner verbs are and which are not associated with the feature [+locomotion] and, by extension, with the perfect auxiliary BE?; (ii) Is there any blunt division between them or is [+locomotion] a gradient phenomenon?

In order to explore these topics, we designed an acceptability judgment task including different types of manner-of-motion verbs. Our main idea is that some manner-of-motion verbs imply directionality while others do not (cf. Folli & Ramchand 2005; Beavers et al. 2010) and these subtle differences in meaning are relevant for auxiliary selection in German. We expect that verbs implying directionality are associated with the dimension [+locomotion] and tend to combine with BE; on the other hand, verbs which do not imply directionality are more likely to appear with HAVE. We develop this idea in more detail in the next section. After elaborating the hypothesis (§ 3.1) and presenting the methodology (§ 3.2), we report the results (§ 3.3) and offer a discussion of some of the theoretical implications of our findings (§ 3.4).

3. The present study

3.1. Hypothesis

The main conjecture of this paper can be formulated as follows. Not all manner of motion verbs behave in the same way. As far as auxiliary selection is concerned, we hypothesize that there is an essential difference between verbs involving directionality/displacement (directional verbs) and verbs which do not involve directionality/displacement (non-directional verbs) (cf. Folli & Ramchand 2005; Beavers et al. 2010). We predict that both classes select BE when accompanied by a directional element (e.g., a PP or a particle); however, in the absence of path specifications, directional manner verbs tend to combine with BE, while non-directional manner verbs are more likely to appear with HAVE. Moreover, bearing in mind that auxiliary selection is a gradient phenomenon (Sorace 2000), we do not exclude the possibility that some verbs display a higher degree of directionality than others, thus leading to internal variation within each semantic class (directional and non-directional), where "more directionality" would be correlated with a stronger acceptability of the auxiliary BE.

3.2. Methodology

This study is based on experimental data. In order to test our predictions, we designed an acceptability judgment task based on a Likert scale. We considered a Likert scale questionnaire a convenient data collection instrument as it allows participants to make gradual judgments instead of providing dichotomous answers based on sharp divisions between grammaticality vs. ungrammaticality. This is especially important in cases where verbs might not be consistent in auxiliary selection and hence the use of one or the other auxiliary might be preferable but

Table 2. Verbs included in the acceptability judgment task

directional motion	non-directional motion	sports activities
fahren 'drive'	*flattern* 'flutter'	*reiten* 'ride'
fliegen 'fly'	*tanzen* 'dance'	*schwimmen* 'swim'
krabbeln 'crawl'	*schweben* 'float'	*segeln* 'sail'
laufen 'run'	*schwingen* 'swing'	*skaten* 'skateboard'
watscheln 'waddle'	*wackeln* 'shake, wiggle'	*surfen* 'surf'

not necessarily exclusive. We selected 5 directional and 5 non-directional motion verbs; in addition, we included 5 verbs designating sports activities as a separate category, given previous evidence that they may display a special behavior, particularly when used without path specifications (Wermke et al. 2016). The verbs taken into account in our study are listed in Table 2.

Except for sports activities, each verb appeared in two conditions, that is, (i) with a path phrase (which could be telic or atelic) and (ii) without a path phrase. Sports-activities verbs appeared only in the first condition. The survey included a total of 25 sentences; see Appendix I. Below each sentence there was a scale with values from 1 to 5. The values were given the following interpretations:

(15) *Scale values*

       1 = uniquely BE;

       2 = preferably BE;

       3 = BE or HAVE without any preference;

       4 = preferably HAVE;

       5 = uniquely HAVE.

Participants were asked to choose one of the options, according to their first impression. Participation was voluntary, and participants were recruited through Linguist List, an online resource for the academic field of linguistics. The data were collected between August 24th and August 27th, 2017, and the platform LimeSurvey was used for this purpose. The experimental group consisted of 174 native speakers of German, 130 females and 44 males, and they were between 22 and 77 years old (M= 36.33).

3.3. Results

Our results will be analyzed in the following order: (i) motion verbs without path specification (§ 3.3.1); (ii) motion verbs with path specification (§ 3.3.2.). In each case, we first deal with directional verbs, and then with non-directional verbs. Sports-activities verbs are analyzed at the end of the subsection 3.3.1. For the sake of clarity, we merged the answers "uniquely BE" and "preferable BE", on the one hand,

and "uniquely HAVE" and "preferably HAVE", on the other. In other words, the responses "uniquely BE" and "preferably BE" will be treated as a uniform category BE, and "uniquely HAVE" and "preferably HAVE", as a single category HAVE.

3.3.1. Manner-of-motion verbs without path specification

Table 3 summarizes the results for directional verbs without path specification and Table 4, for non-directional verbs without path specification.

As can be observed, there is a noticeable difference in the choice of auxiliary between directional and non-directional manner of motion verbs. Directional verbs show a strong preference for BE (93.3%), while non-directional verbs display the opposite pattern, since HAVE was judged as the most appropriate option (69.1% of the answers). However, the use of BE with non-directional verbs is by no means excluded. BE was considered the only acceptable choice in 11.45% of the cases, and 19.54% of the answers showed no preference for one or the other auxiliary.

Moreover, each class of verbs exhibits internal variation to some degree. Starting with the directional class, *fahren* 'drive', *fliegen* 'fly' and *laufen* 'run' displayed a clear-cut inclination to BE (100% for *fahren* 'drive' and *fliegen* 'fly', and 99% for *laufen* 'run') and, correspondingly, a clear rejection of HAVE. The acceptability of HAVE was slightly higher for *watscheln* 'waddle' (6.36%, if we analyze jointly "BE/HAVE" and "HAVE"). Finally, *krabbeln* 'crawl' deviates even more from the other verbs. Although BE is undoubtedly the preferred option (74%), 26% of the informants judged HAVE as a possible choice as well (9.82% of the

Table 3. Directional verbs without path specification

	B %	B/H %	H %
FAHREN	100	0	0
FLIEGEN	100	0	0
KRABBELN	74	16.18	9.82
LAUFEN	98.84	1.16	0
WATSCHELN	93.64	5.2	1.16
MEAN	**93.3**	**4.5**	**2.2**

Table 4. Non-directional verbs without path specification

	B %	B/H %	H %
FLATTERN	9.83	30.64	59.53
SCHWEBEN	19.08	30.64	50.28
SCHWINGEN	26.59	30.64	42.77
TANZEN	1.74	5.2	93.06
WACKELN	0	0.58	99.42
MEAN	**11.45**	**19.54**	**69.1**

answers corresponds to HAVE and 16.18% to either BE or HAVE). It is important to notice that both *krabbeln* 'crawl' and *watscheln* 'waddle' encode a relatively rich manner component which can be characterized, roughly speaking, as "move slowly and with difficulties using hands and knees" and "walk with short steps, moving slowly from side to side", respectively. By contrast, the other verbs refer to less complex manner dimensions. Moreover, *krabbeln* 'crawl', which shows the highest rate of acceptability for HAVE, denotes less prototypical motion involving a horizontal (instead of vertical) position of the body. Thus, a possible explanation of the slightly different behavior of *krabbeln* 'crawl' and, to a lesser extent, *watscheln* 'waddle' could be that the prominence of manner slightly overshadows the dimension of forward motion and directionality. At least this could be true for those (few) speakers who rated HAVE as a possible choice.

Turning now to non-directional verbs, the following cline in the acceptability of BE can be observed: *schwingen* 'swing' > *schweben* 'float' > *flattern* 'flutter' > *tanzen* 'dance' > *wackeln* 'shake, wiggle' (see Table 4). None of these verbs inherently implies a change of location (an entity can swing, float, flutter, dance or shake/wiggle without moving from one spatial point to another; see also Levin 1993: 264-265) and, overall, HAVE turned out to be the preferred choice (69.1%). Yet, most of the verbs are also compatible with BE, but, as already mentioned, the rate of acceptability for this auxiliary varies from one verb to another.

What is the reason for this difference in syntactic behavior? Again, it seems that auxiliary selection is sensitive to subtle semantic aspects encoded in the manner verb. For example, both *schwingen* 'swing' and *wackeln* 'shake, wiggle', two opposite poles of our cline, refer to motion from side to side or back and forth. However, *schwingen* 'swing' evokes an arc path, while *wackeln* 'wiggle' is not typically associated with any salient trajectory. This might be the explanation of why *schwingen* 'swing' is more likely to accept BE than *wackeln* 'wiggle'. As for *schweben* 'float' and *flattern* 'flutter', our results show that these verbs exhibit a higher degree of compatibility with BE than *wackeln* 'shake, wiggle' and *tanzen* 'dance'. We know, thanks to our encyclopedic knowledge, that *schweben* 'float' and *flattern* 'flutter' may potentially involve displacement from one place to another, even if this aspect of meaning is not profiled (cf. Langacker 2008) or highlighted in the verb semantics, that is, it is not totally unlikely that floating and fluttering result in a change of location. It is less probable (though not impossible) for shaking/wiggling and dancing to become a manner of moving along a translational path and this is could be the reason why *schweben* 'float' and *flattern* 'flutter' are more likely to accept BE than *wackeln* 'shake, wiggle, shake' and *tanzen* 'dance'.

A special case mentioned in previous studies are sports activities. Wermke et al. (2016) state that, when used without a directional specification, these verbs combine with either BE or HAVE, although the use of BE is more frequent. When BE is used, focus is placed on the displacement; on the contrary, HAVE emphasizes the activity itself. The results of our acceptability judgment task corroborate this statement (the overall preference for BE is 61.62%) but at the same time they show that the choice of one or the other verb (and hence one or the other conceptualization of the motion events) is not totally free, since the prominence of directionality

Table 5. Sports-activities verbs without path specification

	B %	B/H %	H %
REITEN	83.81	12	4.19
SCHWIMMEN	83.24	12.72	4.04
SEGELN	76.3	12.7	11
SKATEN	38.73	44.51	16.76
SURFEN	26.01	41.04	32.95
MEAN	**61.62**	**24.59**	**13.79**

associated with the verb meaning may play an important role here. A cursory look at table 5 suffices to be aware that verbs whose meaning clearly involves forward motion, such as *reiten* 'ride on horse', *schwimmen* 'swim' or *segeln* 'sail' are more likely to combine with BE than verbs such as *skaten* 'skateboard' or *surfen* 'surf', which do not imply thins kind of continuous uninterrupted directionality. Indeed, what sets *surfen* 'surf' and *skaten* 'skateboard' apart from the other verbs is that there are obstacles on the trajectory, such as waves in the case of surfing and e.g., vert ramps, walls, etc. in the case of skateboarding.

3.3.2. Manner-of-motion verbs with path specification

We hypothesized that manner of motion verbs accompanied by a path specification would show a clear preference for the auxiliary BE independently of verb semantics, since directionality and, by extension, locomotion is overtly conveyed in the path phrase. Tables 6 and 7 summarize the results.

As Tables 6 and 7 show, BE is the auxiliary that would more likely be used when motion verbs are accompanied by a path phrase. Hence, in the case of non-directional manner verbs, there is a noticeable difference in auxiliary choice between uses with and without an overtly expressed path (96.19% vs 11.45%). As expected, the difference between these two types of uses is much less noticeable in the case of directional verbs, which are already associated with the feature [+locomotion] even in the absence of a path phrase. Quite surprisingly, a few native speakers would allow the use of both BE and HAVE with the verbs *fahren*

Table 6. Directional motion verbs with path specification

	B %	B/H %	H %
FAHREN	96.53	3.47	0
FLIEGEN	98.84	1.16	0
KRABBELN	100	0	0
LAUFEN	100	0	0
WATSCHELN	100	0	0
MEAN	**99.07**	**0.93**	**0.00**

Table 7. Non-directional motion verbs with path specification

	B %	B/H %	H %
FLATTERN	100	0	0
SCHWEBEN	90.18	7.51	2.31
SCHWINGEN	92.49	5.2	2.31
TANZEN	98.26	0.58	1.16
WACKELN	100	0	0
MEAN	**96.19**	**2.65**	**1.16**

'drive' and *fliegen* 'fly' followed by a path phrase in an intransitive construction (3.47% and 1.16%, respectively). One possible answer to this unexpected result is that these verbs can also be used transitively, in which case they combine with HAVE; see (16) and (17). Thus, it might be that those informants who chose the option "B/H" interpreted the relevant sentences as ambiguous, that is, intransitive (BE) or transitive with omitted direct object argument (HAVE), although, as can be observed, the latter interpretation is extremely unusual.

(16) Er hat   mich zur   Schule gefahren.
     he HAS me   to.the school driven
     'He drove me to school.'

(17) Das Team hat   Medikamente nach Nepal geflogen.
     the team HAS medicine   to   Nepal flown
     'The team flew medicine to Nepal.'

With regard to non-directional verbs with path phrase, there were three cases where, besides BE, the use of HAVE was rated as appropriate, although to a very limited extent, namely *schweben* 'float', *schwingen* 'swing' and *tanzen* 'dance' (see Table 7). At this stage, we do not know why these particular verbs were rated differently from the other verbs. What seems to be clear, though, is that the non-directional verbs semantics somehow interacts with the directional meaning of the path phrase, thus slightly decreasing the acceptability of BE, although this auxiliary verb remains the only option for over 90% of native speakers (98.26% for 'dance', 92.49% for 'swing' and 90.18% for 'float').

In the next section, we discuss in more detail the implications of our findings.

3.4. Discussion

First of all, the results of our study confirm that auxiliary selection is sensitive to the feature [+locomotion], which, in turn, is related to the salience of directionality associated with the verb. While directional motion verbs, that is, verbs involving displacement from one spatial point to another, tend to combine with BE, non-

directional motion verbs, that is, verbs that do not inherently imply a change of location, are more likely to select HAVE. A slight impact of the distinction between directional vs. non-directional manner-of-motion verbs has also been observed in the presence of a path phrase, although a clear majority of informants preferred the use of BE in these cases (99.34% for directional verbs vs. 96.73% for non-directional motion verbs). Interesting enough, experimental data show that more fine-grained associative inferences related to our world knowledge might also be relevant for the choice of BE vs. HAVE (cf. e.g., *schwingen* 'swing' vs. *wackeln* 'wiggle, shake', *reiten* 'ride on horse'/*schwimmen* 'swim'/*segeln* 'sail' vs. *skaten* 'skateboard'/*surfen* 'surf', etc.), although a different experimental task focused on this phenomenon should be carried out in order to explore it more systematically.

It is also important to stress at this point that there is independent cross-linguistic evidence for the relevance of directionality associated with manner verbs for their syntactic behavior. As is well known, Talmy (1991, 2000) classifies languages as either verb-framed (e.g., Romance, Turkish, Basque) or satellite-framed (e.g., Slavic, Germanic). Verb-framed languages lexicalize the path of motion in the verb and express the manner, if specified, in a secondary element such as a PP or a gerund. Satellite-framed languages, in turn, encode the manner of motion in the verb, with the path being relegated to secondary elements associated with the verb such as particles, prefixes, and postpositions. The paradigmatic examples in (18a) and (18b) illustrate this opposition.

(18) a. La botella entró   en la   cueva (flotando).   (Spanish)
       the bottle entered in the cave   floating
       'The bottle entered the cave (floating).'
    b. The bottle floated into the cave.   (English)

Events involving boundary crossing, that is, the traversal of a spatial goal, are especially sensitive to these typological constraints (cf. *entrar en la habitación corriendo* 'enter the room running' versus *correr hacia la habitación* 'run towards the room'; see Aske 1989; Slobin & Hoiting 1994).

However, quite unexpectedly, verbs such as *correr* 'run', *volar* 'fly' or *nadar* 'swim' are capable of combining with spatial goals, even in contexts where the subject ends up at the goal of motion; see (19), taken from Demonte (2011):

(19) a. Juan corrió a la panadería.
       John ran   to the bakery
       'John ran to the bakery.'

   b. Mi hija   voló a Barcelona.
      my daughter flew to Barcelona
      'My daughter flew to Barcelona.'

   c. Ayer   nadé   a la orilla.
      yesterday I.swam to the shore
      'I swam to the shore yesterday.'

By contrast, verbs such as *bailar* 'dance', *flotar* 'float' or *tambalear* 'wiggle' systematically reject PPs involving boundary crossing (see also Naigles & Terrazas 1998; Fábregas 2007; Son 2007; Beavers et al. 2010):

(20) a. *Luis bailó   al   puente.
         Luis danced to.the bridge

   b. *La pelota flotó   a la cueva.
       the ball   floated to the cave

   c. *Juan tambaleó a la cocina.
       John wiggled   to the kitchen

This fact thus provides further evidence that the dimension of directionality is relevant for the syntactic behavior of manner of motion verbs (see also Folli and Ramchand 2005 for related phenomena).

In the second place, although some verbs are more prototypically linked to BE than others, [+locomotion] is not an inherent property of verbs but rather a property of more abstract structures or constructions (e.g., Goldberg 1995; Rosemeyer 2014; Mateu & Massanell 2015), since some verbs can combine with both BE and HAVE thus offering a different perspective or *conceptualization* of the motion event (displacement vs. non-displacement/activity). Hence, although the prominence of directionality associated with the verb root is a good predictor of auxiliary selection, as has been shown throughout the paper, the verb semantics itself does not determine the choice of HAVE vs. BE. For example, even some clearly directional motion verbs such as *schwimmen* 'swim' or *reiten* 'ride on horse' can appear with HAVE when the speaker's intention is to highlight the sports activity itself by downplaying the dimension of locomotion. By the same token, it is possible to impose a change-of-location perspective on non-directional motion verbs by either adding a path phrase or simply using them with the auxiliary BE (e.g., *schweben* 'float', *flattern* 'flutter'). This suggests that it is not only lexical semantics but rather an interaction between lexical semantics and a particular semantic construal imposed by the constructions "BE+PARTICIPLE" and "HAVE+PARTICIPLE" that should be taken into account when dealing with auxiliary selection with German verbs of motion.

The third observation that derives from our study refers to the notion of gradience. Sorace (2000) argues that the correlation between auxiliary selection and verb semantics is gradient, i.e., verbs tend more or less strongly to combine with one or the other auxiliary depending on where they are placed in the hierarchy (see Table 1). While verbs of non-motional process and change-of-location constitute the "core classes" which are consistent in auxiliary choice, the remaining verb classes allow some variation. Our results not only empirically support Sorace's (2000) semantic approach to auxiliary selection, but they also show that semantic classes themselves might be organized around a hierarchical structure. In the case of manner-of-motion verbs, the prominence of directionality seems to be the most relevant factor. Specifically, directional verbs tend to combine with BE, while

non-directional verbs are more likely to combine with HAVE. At the same time, there seems to be internal variation within each subclass, which is also determined by different grades of directionality/path salience.

Finally, some implications of our analysis for the process of grammaticalization should be pointed out. As is already known, similarly to Dutch, auxiliary choice of manner-of-motion verbs was sensitive to telicity in previous stages of German (Sapp 2011). In contemporary German, the relevant factor is not telicity, but [+locomotion]. The first motion verbs that formed the perfect with BE were *kommen* 'come', *steigen* 'rise' and *fliehen* 'flee' (Diedrichsen 2013). Hence, the development of BE-perfect with motion verbs began with predicates that conform to a prototype of transition since they inherently encode a telic path. Then, a gradual extension took place where [+locomotion] triggers BE and [-locomotion] triggers HAVE, independently of telicity. Gillmann (2015) suggests in her corpus-based study that the use of BE extended to other motion verbs by frequency (cf. Bybee 2010), since there is a correlation between token frequency and BE-perfect where the most frequently occurring manner-of-motion verbs are most likely to appear with BE (see also Gillmann 2011). While her argument is supported empirically by corpus data, she is missing the fact that, besides frequency, the process of extension of BE-perfect is sensitive to the salience of directionality as well. In fact, those verbs that have the highest token frequency in Gillmann's (2015) data (e.g., *fahren* 'drive', *laufen* 'run', *fliegen* 'fly') show a high prominence of directionality. Our empirical task clearly shows that manner verbs implying directionality already generalized the use of BE and this holds even for less frequent predicates such as e.g., *watscheln* 'waddle'; however, the productive extension of "BE + motion verb" is still in process and, particularly, it is spreading to non-directional verbs. Despite the fact that these verbs do not profile motion along a spatial axis, our world knowledge allows us to infer that some of them are associated with a certain path (e.g., *schwingen* 'swing') or have the potential to describe the manner of moving along a spatial axis (e.g., *schweben* 'float'). These associative aspects of meaning seem to be relevant for the process of grammaticalization of "BE + motion verb" since verbs which are less likely to allow these kinds of inferences (e.g., *wackeln* 'shake, wiggle, *dance* 'tanzen')' reject the auxiliary BE.

4. Concluding remarks

In this paper, we offered a semantic approach to auxiliary selection with manner-of-motion verbs in German. Given the lack of consensus regarding which manner verbs select BE and which select HAVE (Seibert 1993; Keller & Sorace 2003; Randall 2007; Gillmann 2015), we carried out an acceptability judgment task with 174 native speakers of German in order to provide further insights into this research topic. Our results revealed that there is a crucial contrast between motion verbs implying directionality and verbs which do not imply directionality. Both types of verbs combine with BE in the presence of a path element (e.g., a PP or a particle). By contrast, when path is not overtly encoded, directional manner verbs show preference for BE whereas non-directional verbs are more likely to select HAVE.

In the first place, our results corroborate the idea that BE-perfect is associated with the feature [+locomotion], as proposed by Randall (2007) and echoed by several scholars in subsequent work (e.g., Gillmann 2015), and show that [+locomotion] is, in fact, related to the *salience of directionality* (cf. Folli & Ramchand 2005; Beavers et al. 2010 for related phenomena). However, despite the fact that some verbs are more typically linked to BE than others, many allow for BE/HAVE alternation and hence [+locomotion] is not a property of verbs themselves but rather a property of the more abstract construction "BE+PARTICIPLE" with which the verbs interact (e.g., Goldberg 1995; Rosemeyer 2014; Mateu & Massanell 2015). On the one hand, directional manner verbs such as *schwimmen* 'swim' or *reiten* 'ride on horse' can appear with HAVE when the speaker's intention is to focus on the activity itself rather than on displacement. On the other hand, certain non-directional verbs (e.g., *schwingen* 'swing', *schweben* 'float', *flattern* 'flutter') can integrate into the "BE+PARTICLE" construction (even if the path is not further elaborated) when the speaker intends to convey a directional perspective. Finally, as is well known, it is possible to impose a displacement interpretation on non-directional motion verbs that otherwise only accept HAVE (e.g., *tanzen* 'dance') by adding a path phrase (cf. Talmy 2000; Lewandowski & Mateu 2014). In short, not only verbs semantics but rather an interaction between verbs semantics and the semantics of the more abstract syntactic pattern "BE+PARTICIPLE [+PP]" should be taken into account when dealing with the feature [+locomotion].

Moreover, the present study supports Sorace's (2000) proposal that auxiliary selection is a gradient phenomenon with more prototypical and less prototypical members associated with each auxiliary verb. However, gradience is not only the outcome of semantic and syntactic differences *between* verb classes, but also *within* verb classes. As is already known, in the case under discussion, the prominence of directionality is a relevant variable that organizes manner verbs in a hierarchical fashion, where more directionality implies a stronger preference, and less directionality, a weaker preference for BE. Interesting enough, not only lexical semantics but also the associative world knowledge (Langacker 2008) seem to be an important factor determining the salience of directionality (cf. e.g., *schwingen* 'swing' vs. *wackeln* 'wiggle, shake', *reiten* 'ride on horse'/*schwimmen* 'swim'/*segeln* 'sail' vs. *skaten* 'skateboard'/*surfen* 'surf', etc.).

Finally, fine-grained aspects of meaning also seem crucial for the process of grammaticalization. Telic path verbs such as *kommen* 'come', *steigen* 'rise' and *fliehen* 'flee' were the first ones to appear with BE (Diedrichsen 2013). Then, a gradual extension of BE with motion verbs took place and nowadays, auxiliary choice is determined by the feature [+locomotion], where manner verbs implying directionality clearly prefer BE over HAVE (cf. Gillmann 2015). However, even some non-directional verbs can, to a limited extent, combine with BE if they denote a manner that (i) could potentially describe motion along a spatial axis (e.g., *schweben* 'float' vs. *wackeln* 'shake, wiggle') or (ii) that is associated with a certain (non-translational) path (e.g., *schwingen* 'swing'). This fact suggests that the construction "BE + motion verb" is starting to spread to non-directional verbs in contemporary German.

References

Aske, Jon. 1989. Path predicates in English and Spanish: A closer look. In *Proceedings of the 15th Annual Meeting of the Berkeley Linguistics Society*, 1-14.

Beavers, John; Levin, Beth & Tham, Shiao Wei. 2010. The Typology of Motion Expressions Revisited. *Journal of Linguistics* 46(2): 331-377.

Burzio, Luigi. 1986. *Italian Syntax. A Government-Binding Approach*. Dordrecht: Reidel.

Bybee, Joan. 2010. *Language, Usage and Cognition.* Cambridge: Cambridge University Press.

Comrie, Bernard. 1976. *Aspect*. Cambridge: Cambridge University Press.

Demonte, Violeta. 2011. Los eventos de movimiento en español: construcción léxico-sintáctica y microparámetros preposicionales. In Cuartero Otal, Juan; García Fernández, Luis & Sinner, Carsten (eds.). *Estudios sobre perífrasis y aspecto*, 16-42. München: Peniope.

Diedrichsen, Elke. 2013. Auxiliary selection in German: Constructional gradience with perfect formation. In van Gelderen, Elly; Cennamo, Michela & Barðdal, Jóhanna (eds.). *Argument Structure in Flux*, 405-434. Amsterdam: John Benjamins.

Fábregas, Antonio. 2007. An exhaustive lexicalisation account of directional complements. *Nordlyd: Tromsø Working Papers in Linguistics* 34(2): 165-199.

Folli, Raffaella & Gillian Ramchand. 2005. Prepositions and Results in Italian and English: An Analysis from Event Decomposition. In Verkuyl, Henk; de Swart, Henriette & Angeliek van Hout (eds.). *Perspectives on Aspect*, 81-105. Dodrecht: Kluwer.

Gillmann, Melitta. 2011. Die Grammatikalisierung des sein-Perfekts. *Beiträge zur Geschichte der deutschen Sprache und Literatur (PBB)* 133(2): 203-234.

Gillmann, Melitta. 2015. Auxiliary selection in closely related languages. The case of German and Dutch. In Kailuweit, Rolf & Rosemeyer, Malte (eds.). *Auxiliary Selection Revisited: Gradience and Gradualness*, 333-358. Berlin: De Gruyter.

Goldberg, Adele. 1995. *Constructions: A Construction Grammar approach to argument structure.* Chicago: Chicago University Press.

Hoekstra, Teun. 1999. Auxiliary selection in Dutch. *Natural Language and Linguistic Theory* 17: 67-84.

Keller, Frank & Sorace, Antonella. 2003. Gradient auxiliary selection and impersonal passivization in German. *Journal of Linguistics* 39(1): 57-108.

Langacker, Ronald. 2008. *Cognitive Grammar*. Oxford: Oxford University Press.

Legendre, Géraldine. 2007. On the typology of auxiliary selection. *Lingua* 117: 1522-1540.

Levin, Beth. 1993. *English Verb Class and Alternations: A Preliminary Investigation*. Chicago: University of Chicago Press.

Lewandowski Wojciech & Mateu, Jaume. 2016. Thinking for translating and intra-typological variation in satellite-framed languages. *Review of Cognitive Linguistics* 14(1): 185-208.

Mateu, Jaume & Massanell, Mar. 2015. A constructional approach to auxiliary selection: Evidence from existential constructions. In Kailuweit, Rolf & Rosemeyer, Malte (eds.). *Auxiliary Selection Revisited: Gradience and Gradualness*, 183-212. Berlin: De Gruyter.

McFadden, Thomas. 2007. Auxiliary selection. *Language and Linguistics Compass* 1(6): 674-708.

Naigles, Letitia & Paula Terrazas. 1998. Motion-verb generalizations in English and Spanish: Influences of language and syntax. *Psychological Science* 9(5): 363-369.

Perlmutter, David. 1978. Impersonal Passives and the Unaccusative Hypothesis. In *Proceedings of the Fourth Annual Meeting of the Berkeley Linguistics Society*, 157-189.

Randall, Janet. 2007. Parameterized auxiliary selection. A fine-grained interaction of features and linking rules. In Aranovich, Raúl (ed.). *Split Auxiliary Systems. A Cross- Linguistic Perspective*, 207-235. Amsterdam, Philadelphia: John Benjamins.

Rosemeyer, Malte. 2014. *Auxiliary Selection in Spanish. Gradience, Gradualness, and Conservation*. Amsterdam, Philadelphia: John Benjamins.

Sapp, Christopher. 2011. Auxiliary selection in the Early New High German perfect tenses. *Groninger Arbeiten zur Germanistischen Linguistik* 53(2): 29-43.

Seibert, Anja (1993). Intransitive constructions in German and the ergative hypothesis. *Working Papers in Linguistics* 14. University of Trondheim.

Slobin, Dan, & Hoiting, Nini. 1994. Reference to movement in spoken and signed languages: Typological considerations. In *Proceedings of the 20th Annual Meeting of the Berkeley Linguistics Society*, 487-505.

Smith, Carlota. 1997. *The Parameter of Aspect*. Dordrecht: Kluwer.

Son, Minjeong. 2007. Directionality and Resultativity: The Cross-linguistic Correlation Revisited, *Nordlyd: Tromsø Working Papers in Linguistics* 34(2): 126-164.

Sorace, Antonella. 2000. Gradients in auxiliary selection with intransitive verbs. *Language* 76: 859-890.

Talmy, Leonard. 1991. Path to realization: a typology of event conflation. *Proceedings of the Seventeenth Annual Berkeley Linguistics Society*, 480-519.

Talmy, Leonard. 2000. *Toward a cognitive semantics. Vol.1 and 2*. Cambridge, MA: MIT Press.

van Hout, Angeliek. 2004. Unaccusativity as telicity checking. In Alexiadou, Artemis; Anagnostopoulou, Elena and Everaert, Martin (eds.). *The Unaccusativity Puzzle: Explorations of the Syntax-Lexicon Interface*, 60-83. Oxford: Oxford University Press.

Wermke, Matthias; Kunkel-Razum, Kathrin & Scholze-Stubenrecht, Werner. 2016. *Duden. Die Grammatik*. Mannheim: Dudenverlag.

Zaenen, Annie. 2011. Unaccusativity in Dutch. Integrating syntax and lexical semantics. In Pustejovsky, James (ed.). *Semantics and the Lexicon*, 129-161. Dordrecht, London: Springer.

Appendix

(I) *Sentences without path specification*

   Directional verbs

   FAHREN
   Sie _____ wirklich viel   zu schnell gefahren.
   they   really   much too fast   driven
   'They really drove too fast.'

   FLIEGEN
   Mehrere Hubschrauber _____ über   der   Stadt geflogen.
   various   helicopters   above the.Dat city   flown
   'Various helicopters flew above the city.'

   KRABBELN
   das Kind _____ im   Zimmer gekrabbelt.
   the child   in.the.Dat room   crawled
   'The child crawled in the room.'

   LAUFEN
   wir _____ barfuβ   im   Zimmer gelaufen.
   we   barefoot in.the.Dat room   run
   'We ran barefoot in the room.'

   WATSCHELN
   Eine Entenfamilie _____ auf dem   Seitenstreifen gewatschelt.
   a   family.of.ducks   on the.Dat shoulder   waddled
   'A family of ducks waddled on the shoulder.'

   Non-directional verbs

   FLATTERN
   Die Fahne _____ im   Wind geflattert.
   the flag   in.the.Dat wind fluttered
   'The flag fluttered in the wind.'

   SCHWEBEN
   der Beutel _____ in der   Luft geschwebt.
   the bag   in the.Dat air   floated
   'The bag floated in the air.'

   SCHWINGEN
   Die Schaukel _____ geschwungen.
   the swing   swung
   'The swing swung.'

   TANZEN
   hans _____ im   Saal getanzt.
   Hans   in.the.Dat hall danced
   'Hans danced in the hall.'

WACKELN
Das ganze Gebäude _____ gewackelt.
the   whole building   shaked
'The whole building shaked.'

Sports activities

REITEN
Sie _____ den ganzen Tag geritten.
they   the whole   day ridden (on horse)
'They went on horseback the whole day.'

SCHWIMMEN
Als Kind _____ ich immer im   See geschwommen.
as   child   I   always in.the.Dat lake swum
'As a child I used to swim in the lake.'

SEGELN
Er _____ in seiner Jugend   viel   gesegelt.
he   in his   youthfulness much sailed
'He used to sail a lot in his youthfulness.'

SKATEN
In meiner Kindheit _____ ich viel   geskatet.
in my   childhood   I   much skateboarded
'I used to skateboard a lot in my childhood.'

SURFEN
Das Mädchen _____ den ganzen Tag gesurft.
the girl   the whole   day surfed
'The girl surfed the whole day.'

(II) Sentences with path specification

FAHREN
Der Chauffeur _____ nach Hamburg gefahren.
the driver   to   Hamburg driven
'The driver drove to Hamburg.'

FLIEGEN
Sie _____ nach Warschau geflogen.
they   to   Warsaw   flown
'They flew to Warsaw.'

KRABBELN
Das Kind _____ durchs   Zimmer gekrabbelt.
the child   through.the.Acc room   crawled
'The child crawled through the room.'

LAUFEN
Nachts _____ eine Maus in den   Laden gelaufen.
at.night   a   mouse in the.Acc store   run
'A mouse ran into the store at night.'

WATSCHELN
Die Pinguine _____ durch den   Schnee gewatschelt.
the penguins   through the.Acc snow   waddled
'The penguins waddled through the snow.'

Non-directional verbs

FLATTERN
Der Schmetterling _____ von Blume zu Blume geflattert.
the   butterfly   from flor   to flor   fluttered
'The butterfly fluttered from one flor to the next.'

SCHWEBEN
Der Revolver _____ durch die   Luft geschwebt.
the   revolver   through the.Acc air   floated
'The revolver floated through the air.'

SCHWINGEN
Der Artist _____ am   Trapez durch die   Kuppel geschwungen.
the artist   on.the.Dat trapeze through the.Acc dome   swung
'The artist swung through the dome on the trapeze.'

TANZEN
Er _____ ins   Zimmer getanzt.
he   in.the.Acc room   danced
'He danced into the room.'

WACKELN
Er _____ über die   Straβe gewackelt.
he   across the.Acc street   waddled
'He waddled across the street.'