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Short title: Language effect on motion event cognition

Bidirectional cross-linguistic influence in motion event conceptualisation in bilingual speakers of Spanish and English

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Abstract

We investigated bidirectional cross-linguistic influence on motion event (ME) expressions in bilingual speakers of two typological different languages (Talmy's typology), Spanish (as L1) and English (as L2). Specifically, we investigated whether bilingual speakers struggle to learn ME expressions in the L2, and whether this process affects ME uses in the L1. Potential effects of L2 proficiency and L2 AoA in both L1 and L2 were also studied. ME expressions elicited from 6-second video-clips were analysed for manner and path components at the level of the verb and of the clause. Results support the hypothesis of bidirectional cross-linguistic influence on motion event conceptualization. In bilinguals' L2, we observed patterns of restructuring, convergence and L1 transfer. In bilinguals' L1, we reported structural and conceptualization patterns that seem to emerge from the contact with the L2. Proficiency and AoA showed modulation in the use of manner verbs on both L2 and L1.

1. Introduction

There is evidence that supports the hypothesis that speakers are guided by their language to think in a particular way before the verbal message is produced (the thinking-for-speaking hypothesis, TFS) (Slobin 1996a; 1996b, among others). This creates special ties between concepts and language forms, that may become entrenched over time. Research shows that speakers from different motion event typologies indeed pay attention to different elements of motion in their discourse and rhetoric style (Slobin 1996a).

In the last two decades, there has been an interest in studying TFS hypothesis and motion event construal in second language acquisition when L2 concept-form mappings are different from those in L1. Specifically, the main questions relate to whether L2 learners restructure these concept-form mappings, or whether they habitually transfer those from the L1 into L2 (conceptual transfer) (Jarvis and Pavlenko, 2008), but also, to which factors may underpin these two possible outcomes of restructuring and transfer. Currently, the findings suggest that restructuring is possible but difficult for L2 speakers (see section 2.3). To add to the complexity of the picture, recent studies also find that learners even with intermediate level of proficiency in the emerging language, show L2 patterns in the L1 (reverse transfer). The current study explores these questions by analysing motion event (henceforth, ME) construal in bilingual speakers of two languages that differ according to Talmy's (1985) typology: Spanish and English.

2. Background

2.1. Motion event expressions and conceptualizations in Spanish and English

Talmy (1985; 1991) proposed a ME typology that divided languages in two groups according to where the path of motion (i.e., the trajectory the figure takes) is expressed in the sentence. Thus, verb-framed languages (henceforth, V-languages) prefer to encode path in the main verb (see the Spanish example in 1). Satellite-framed languages (henceforth, S-languages) prefer to encode the path in a satellite position, while the verb tends to express manner of motion (i.e., the way a figure moves). In the English example in 2, path is expressed in the preposition *into*, while manner is expressed in the verb, *skips*. In V-

languages the expression of manner of motion is optional, usually subject to event saliency; but when expressed, it tends to be encoded in adjuncts such as gerunds, adverbials, or prepositional clauses (Slobin 1996a; 2006). In (1), for example, the path is expressed in the verb *entró/"*enter*"* and manner is expressed in the gerund *saltando/"*jumping*"*.[1]

(1) (Spanish): *La mujer entró [path verb] al edificio saltando [manner gerund]*/'the woman entered the building jumping'
(2) (English): *The woman skips [manner verb] into [path preposition] the building*

The differences in how path and manner are encoded in V- and S- languages have implications that impact the grammar, discourse and rhetoric styles in these language groups (Slobin and colleagues, 1996a; 1996b; 1997; 2000; 2003, among others). Focusing on English, an S-language, manner and path concepts are frequently tightly packaged in a *manner verb + path satellite* pattern, becoming part of a single conceptual event (Slobin 2000, p.132). Also, the position of manner in the verb makes this element highly salient. This explains the large manner lexicon available in S-languages compared to V-languages (Slobin 1996a; 1996b).

In contrast, Spanish, a V-language, presents a more mixed picture because, although the preferred pattern is to express path in the main verb and to omit manner, manner can be expressed through verbs when it is salient in the event (Feist et al.2007; Naigles et al. 1998). In V-languages, expressing path can be triggered by the types of trajectories occurring in the event. When a figure crosses a boundary (e.g., a man moves from outside to the inside of a building) a change of state occurs; this change of state can only be expressed in Spanish by means of path verbs (see (1)). When paths do not express a boundary being crossed, speakers can choose to express manner or path verbs as in (3); in the literature these types of paths are called trajectory paths (Alonso 2020; Muñoz and

[1] Slobin (2006) included a third type, the equipollently-framed languages, characterised by expressing both manner and path in the main verb (e.g., Mandarin and Vietnamese). Additionally, today we know that within each typology there could be intra- typological variation (Berman and Slobin 1994; Filipović 1999; 2007; 2013; Ibarretxe-Antuñano 2009; among others) and even, variation has been observed among dialects of the same language (Hijazo- Gascón 2018).

Cadierno 2019; Slobin 1997). Interestingly, if manner is encoded in the verb it tends to appear as a bare verb (Slobin 1996a; 1996b).

(3) (No-boundary crossing) *la muchacha gatea [$_{MANNER\ VERB}$] debajo de la mesa/* 'the girl crawls under the table'

(4) *The boy put the frog down$_{[path\ preposition]}$ into$_{[path\ preposition]}$ the jar* (from Slobin 1996b: 84)

(5) *El nino metio la rana en el frasco que había abajo$_{[relative\ clause\text{-}ground]}$* / The boy inserted the frog en(=in/on) the jar that was below (from Slobin 1996b: 84)

These ME patterns seem to have consequences for the structures of these languages by additionally creating different ME lexical and grammatical patterns. For example, having prepositions to express path of motion allows the speaker to package more than one path and ground in a sentence in English; consequently, this language produces richer movement descriptions than Spanish. In Spanish, on the other hand, only one path can be expressed via verbs and only the ground associated to that path tends to be produced (Slobin, 1996a). In (4) and (5) show two different descriptions of the same scene. In English, the speaker encoded two paths, *down* and *into* in the same sentence. In order to express the same meaning, the Spanish speaker resorted to additionally create a relative clause that informed about the location of the jar; but the path taken by the frog (in English expressed via the path *down*) is left to be inferred. The same characteristics are observed in relation to expressions of grounds. English can encode more than one ground in a sentence. In (6) and (7) descriptions of the same scene are presented in English and Spanish. As it can be observed, in English, the grounds *cliff* and *pond* are expressed in the same sentence, as they are related to the paths *over* and *into*. However, this is not the tendency in Spanish, where speakers would need produce two different sentences to inform about the *cliff* and the *pond*. But even more interesting, the Spanish speaker in (6) would prefer describing static settings: e.g., *donde había harta agua/* "where there was plenty of water". This seems to be a characteristics of Spanish ME descriptions; that is, more interest in describing static scenes and the emotional circumstances of the characters involved in the events. As Slobin described it: they are "more like photographs" . The motions, on the other hand, are left to

be inferred (Choi 2009; Ibarretxe-Antuñano 2009; Sebastián and Slobin,1994; Slobin 2000; 2006)[2].

(6) *He threw him over* *[path preposition]* *the cliff* *[ground]* *into* *[path preposition]* *a pond*[ground] (from Slobin 1996a: 202)

(7) *Los tiro a un precipicio* *[ground]* *donde había harta agua* *[static description of the ground]* . *Entonces se cayeron* *[manner verb]*.// [He] threw them to a cliff where there was plenty of water. Then they fell (from Slobin 1996a: 202).

What needs to be highlighted in this regard is that the two languages have other means of expressing the same events, but they tend to express them according to the above-mentioned patterns, reflecting conceptualisation tendencies as well (Treffers-Daller and Tidball, 2015).

2.3. Motion event construal in second language

Given that languages of different typologies predispose speakers to particular event conceptualizations, learners of a typologically different L2 need to restructure these conceptualizations and learn the L2-specific ones (Berman and Slobin 1994: 640; Brown and Gullberg 2011). L2 learners require not only to learn new forms (i.e., lexicalization patterns) and map them to L1 meanings. In addition, they need to learn what information is verbally expressed and packaged for communication. This may be a challenge for L2 speakers (Larragaña et al. 2001; Slobin 1987).

One group of studies supports the hypothesis that restructuring is difficult. In this group most investigations reported that L2 speakers used the typical L2 patterns but in lower frequencies compared to L2 monolinguals. Additionally, transfer from L1 was observed even in advanced L2 speakers (Cadierno 2008; Daller and Treffers-Daller 2011; Larragaña et al. 2011, among others). Other studies in this same group found that alongside transfer, L2 learners experienced other types of reconceptualization processes such as

[2] However, Ibarretxe-Antuñano and Hijazo-Gascón (2011) and Hijazo- Gascón (2018) found that in some Spanish varieties more than a ground expression is allowed.

restructuring, creative/hybrid constructions and convergence (Brown 2015; Gullberg and Brown 2010; Treffers-Daller and Tidball 2015). Apart from these alternative conceptualization processes, in some studies production of non-L2 patterns was found, such as the use of untypical ground descriptions and ungrammatical sentences (Cadierno and Ruiz, 2006), non-typical sentence structures (Navarro and Nicoladis 2005), and different path and locative information (Larragaña et al. 2011); these features provide evidence to the hypothesis that restructuring ME patterns in the L2 is difficult to achieve. Nevertheless, there is a small group of studies that suggests that restructuring L2 patterns is possible (Brown and Gullberg, 2011; Cadierno and Ruiz 2006, among others).

There is additional evidence indicating that during this process of learning MEs in a typologically different L2, the L1 is affected; specifically, the L1 shows signs of variation indicating an influence of the L2 ME patterns. For example, Hohenstein et al. (2006) analyzed L1 Spanish-L2 English speakers and found L2 effects on L1 in both early and late bilinguals, with a greater L2 effect in late bilinguals. Filipović (2011) found bidirectional transfer in the productions of both manner and path verbs in Spanish-English early bilinguals. Brown and Gullberg (2010, 2011) also detected effects of the L2 on the L1 in expressions of path of motion in L1 Japanese (V-language), learners of English as an L2 with intermediate proficiency level. The L2 English learners in this study used a mixed strategy of path lexicalization in their L1: a presence of path verbs, typical in Japanese, but also a high use of path adverbials, more typical for English. Furthermore, they produced a high number of path expressions inside the clause, even more than the L1 monolinguals.

In a more recent investigation, Muñoz and Cadierno (2019) reported bidirectional transfer in ME expressions. The authors analysed a combination of S-language (English) as L1, and a V-language (Spanish) as L2, in speakers with L2 low, intermediate and upper intermediate proficiency levels. The authors found transfer from L1 to L2 at all proficiency levels. However, bidirectional influence was observed only in the upper intermediate group. The low intermediate group performed similarly in L1 and L2 suggesting a case of convergence. L2 effects on L1 in ME expressions has also been reported in Spanish-speaking children learning English at school level (Aveledo and Athanasopoulos 2016).

3. Aim of the Study

While studies report bi-directional transfer in bilinguals, most studies focused on the MEs expressed mainly in the verb. Secondly, methodologies vary considerably (characteristics of L2 learners; data elicited from narratives, pictures and video descriptions; type of language typology combinations). Importantly, the factors contributing to the degree of such transfer are still relatively under-explored. Here, our specific research aims were to determine: i) the preferred ME patterns (path vs manner) in motion event constructions in both the L1 and the L2 in bilingual speakers of Spanish and English; ii) whether bilinguals transfer L1 ME patterns into the L2; iii) whether L2 ME patterns affect L1 ME patterns and iv) whether L2 proficiency and age of acquisition (henceforth, AoA) modulate these processed in L1 and L2. For this, ME descriptions elicited from L1 Spanish- L2 English speakers were compared to those elicited from monolingual speakers of English and of Spanish. The elicited descriptions were quantitatively and qualitatively analysed by: firstly, observing the preferred meanings expressed in the main verb (path vs. manner); secondly, studying how path and manner verbs were combined with other path and manner meaning information in the clause. This analysis at the level of the clause tries to better capture how bilinguals distribute ME components within the whole sentence and observe whether bilinguals follow the typical encoding patterns detected in monolingual speakers, or alternatively, look for different strategies to encode path/manner concepts in the clause.

4. Method

4.1. Participants

Participants were 124 in total: 44 native speakers of English (aged 19 to 58), 42 native speakers of Spanish (aged 16 to 40), and 38 L1 Spanish-L2 English speakers (aged 20 to 47). They all shared the same socioeconomic level (middle class) and educational level (graduate and postgraduate).

Native English speakers were born in the UK and had very little or no knowledge of Spanish or any other V-language. Native speakers of Spanish were born in Venezuela and their English proficiency level was the lowest according to the Quick Placement Oxford Test (QPT 2001, mean score of 20.42 on a 60-points scale). Bilingual speakers were recruited in

the UK and the USA. They were all native speakers of Spanish, early and late learners of English, resident in an English-speaking country. Through a general questionnaire, we obtained information about their L2 status, AoA in L2, and length of residence (henceforth, LoR) in an English-speaking country. Proficiency was formally measured with the QPT which indicated that these participants were between advanced-intermediate to highly advanced L2 speakers of English. Table 1 shows bilingual speakers' ranges and means on key background variables.

Table 1. Linguistic background of bilingual speakers according to AoA, LoR, QPT

	Range	*Mean*	*SD*
AoA*	3-26	11	3.89
LoR**	0.5-17	5.6	3.44
QPT score	32-59/60	44.18	5.72

** Years of age, ** years*
Note: AoA = Age of Acquisition; LoR = Length of residence in an English speaking country; QPT = Oxford Quick Placement Test

4.2 Materials

The materials consisted of 22 silent video clips of 6 seconds showing dynamic self-initiated spontaneous motion events. Eight sets of clips were designed by the authors specifically to test path and manner; the rest were fillers (see also, Aveledo and Athanasopoulos, 2016).

Each video showed a real human figure following a certain path in a certain manner following a ground. Paths involved different spatial relations (i.e., *in, out, down, up,* following a square path pattern. Stimuli are presented in Table 2 and Figure 1 illustrates examples of two clips. Five clips showed boundary-crossing paths while (3) showed trajectory paths. We acknowledge that the division of stimuli is unbalanced. However, given that most previous studies exclusively used boundary-crossing path stimuli, we were required to have a higher number of this type of path to be able to compare our results to those of previous studies. The inclusion of trajectory paths was initially exploratory. To our knowledge, most studies on L2 ME analysed exclusively boundary-crossing stimuli[3] as it is in this type of path where Spanish and English ME description differ: Spanish requires a

[3] Although in a recent study, Muñoz and Cadierno (2019) included both types of paths in their analysis.

path verb, while English would prefer a manner verb. However, we think this limitation is unnecessary because Spanish speakers can express path when observing trajectory paths; and English speakers should always override Spanish speakers in their preference for encoding manner verbs in any contexts. Finally, presenting stimuli with both types of paths will enrich our knowledge of the type of ME expressions produced by speakers under more experimental conditions.

Table 2. Path-manner structure of video clips

Target video	**Type of event**
1. a woman is dancing into a room	boundary-crossing
2. a woman is hopping into a building	boundary-crossing
3. a woman is twirling into a gym	boundary-crossing
4. a man is walking out of a room	boundary-crossing
5. a woman is jogging into a room	boundary-crossing
6. a woman is crawling crossing under a table	Trajectory
7. A man dragging himself up sat on his bottom	Trajectory
8. a man is jumping following a square pattern path	Trajectory

Trajectory-path event

Boundary-crossing event

Figure 1. Pictures of videos of two of the experimental stimuli (a trajectory path and a boundary-crossing path).

4.3 Procedures

Clips were shown in ten different fully randomized orders in a PowerPoint presentation. The instruction was to "describe in few words, but in a whole idea, what do you think has happened in the video" and its equivalent in Spanish. Participants were specifically

instructed to give their response after watching the entire clip, when a blank slide appeared. They could watch a clip again, but less than 5% asked for it.

The order in which bilinguals performed the tasks was counterbalanced: half of the participants performed the task in Spanish first, and at least one week later, in English. For the other half, the order was reversed (Breakwell, Hammond, Fife-Schaw and Smith 2006). Bilinguals received the instructions in English when they performed the verbal task in this language, and in Spanish when they carried it out in Spanish.

4.4 Coding and analysis

All the responses were divided into clauses. Although responses were mainly single clauses, complex sentences were also produced, particularly main clauses accompanied by relative or subordinated clauses. There were also cases of coordinated clauses. We performed two main analyses: i) one quantitative analysis at the level of the verb; and ii) a second analysis, semi-quantitative, at the level of the clause.

4.4.1 Verb analysis

Main verbs were selected from main clauses. When the response was given in two coordinated sentences, only the verb of the first clause was selected. This decision was taken in order to keep homogeneity for the analysis and assuming that the first spontaneous description is the one reflecting the speaker's attentive preference. Verbs were classified according to whether they encoded path, manner, or *other concepts*. *Other concepts* (henceforth, *other*-verbs) included concepts that were not strictly speaking manner or path. For example, it included deictic verbs (e.g., *come*, *go*) and neutral verbs (e.g., *move*, *pass*).[4]

Given that our data was not normally distributed we computed Mann-Whitney U tests (Field 2009:345) comparing frequencies of responses for each verb type (manner, path and other; see also Brown and Gullberg 2013)). The English answers of the bilinguals were

[4] Some studies on MEs include deictic and neutral verbs within the path verb category. However, in this study we did not include them in this category following Slobin (1996b) who explained that although these verbs indicate movement, they are not strictly expressing trajectory; therefore, including them as path verbs is not exact.

compared to those of monolingual speakers of English, and the Spanish answers to those of monolingual speakers of Spanish. Finally, the frequencies of manner, path verbs and *other*-verbs in Spanish and in English produced by bilinguals were partially correlated to L2 proficiency, whilst controlling for AoA, and to AoA, whilst controlling for L2 proficiency; that is, L2 proficiency was correlated while controlling for AoA and vice versa. We did not include LoR in the analysis as it presented collinearity with the QPT scores. We decided to include proficiency as it is the most widely reported variable in similar studies, thus, allowing for comparisons.

4.4.2 Clause analysis

In this analysis, all the main clauses were included. Thus, every other path and manner concept that accompanied the (path and manner) verb in the clause was counted. Path and manner verbs were classified according to whether they appeared alone (bare forms), with manner(s), with path(s), or both, manner and path. We found the following combinations:

a. Bare form (i.e., the verb appears without any other path or manner)
b. Manner/Path_Verbs + manner
c. Manner/Path_Verbs + path
d. Manner/Path_Verbs + path + manner
e. Manner/Path_Verbs + manner + manner
f. Manner/Path_Verbs + path + path
g. *Other*-verbs: other motion verbs and other non-motion verbs

We divided *other*-verbs in: 1) motion-related, indicating motions other than path or manner (i.e. *ella va a la puerta* 'she goes to the door') 2) non-motion event related, indicating states or actions not related to the event, e.g., "she *looks* happy".

We calculated the percentage means of these patterns in the L1 and L2 of bilinguals and in both monolingual groups and compared them in both preferred order and frequencies.

Keeping in mind the characteristics of English and Spanish discussed in Section 2.1, we observed how bilinguals: 1) package path and manner in the clause, as path and manner tend to be packaged in a single clause in English but not in Spanish ; 2) package paths within the clause, as in English it is possible to stack more than one path in a single clause, while in

Spanish, paths need to be expressed in different clauses; and 3) present manner descriptions within the clause, as in English often more elaborated manner descriptions are found. Additionally, we observed whether bilinguals were keeping the typical Spanish ME patterns in their L1, or alternatively, L2 patterns emerged in L1. Patterns in speakers' groups were compared with Mann-Whitney U tests.

5. Results

5.1 Verb analysis

Table 3 shows the mean percentage responses of path, manner and *other*-verbs in the main verb for the four language groups. As expected, English speakers preferred to encode manner verbs to a significantly greater extent than Spanish speakers (89.20% vs. 49.92%, Man Whitney $U = 55.00$, $p < 0.001$, $r^2 = 0.66$), while Spanish speakers encoded significantly more path verbs than English speakers did (46.54% vs. 3.69%, Mann Whitney $U = 28.50$, $p < 0.001$, $r^2 = 0.74$). In relation to *other*-verbs, the groups did not differ statistically ($U = 677.50$, $p < 0.08$). Bilinguals' responses in English, the L2, were different from those produced by English monolinguals (see table 3). More specifically, they produced significantly more path and *other*-verbs ($U = 530.00$, $p = .001$, $r^2 = 0.13$; and $U = 483.00$, $p < .000$, $r^2 = 0.44$, respectively); and less manner verbs than their monolingual peers ($U = 197.50$, $p < .000$, $r^2 = 0.15$). Bilinguals' responses in Spanish were somewhat unexpected: bilinguals produced significantly less manner verbs ($U = 388.50$, $p < .003$, $r^2 = 0.12$ medium effect size) than Spanish monolinguals. But the groups did not differ in their production of path ($U = 480.00$, $p = .057$), neither *other*-verbs ($U = 522.00$, $p < .087$).

Table 3. Mean proportion of motion verbs (path, manner and *other-verbs*) in the four language groups

	Monolinguals English		Bilinguals (English)		Bilinguals (Spanish)		Monolinguals Spanish	
	M	(SD)	M	(SD)	M	(SD)	M	(SD)
Path	3.69	(6.37)	17.91	(21.78)	53.77	(18.05)	46.74	(20.56)
Manner	89.20	(10.64)	60.96	(25.01)	39.49	(18.19)	49.92	(19.80)
Other	7.10	(10.23)	21.12	(19.14)	6.74	(8.98)	3.34	(6.34)

Partial correlations were run to determine how L2 AoA affects ME patterns in bilinguals' L2, whilst controlling for L2 proficiency. Results showed a significant negative correlation with manner verb production ($r(35)= -.361$, $n=38$, $p = .03$), suggesting that those who acquired English earlier produced more manner verbs in the L2 than late learners. There were no significant correlations between AoA and path or *other*-verbs. Three more partial correlations determined the relationship between path, manner and *other*-verbs used in English and L2 proficiency, whilst controlling for AoA. Results revealed a significant positive correlation between L2 proficiency and manner verb production ($r(35)= -.343$, $n=38$, $p = .04$) suggesting that those who had a higher proficiency in English produced more manner verbs in the L2 than those who had a lower English proficiency. Path verbs and *other-verbs* did not correlate with L2 proficiency.

In Spanish, another three partial correlations determined the effect of AoA in ME patterns, whilst controlling for L2 proficiency. Results showed a significant negative correlation with manner verb production ($r(31)= -.424$, $n=34$, $p = .01$), which suggests that the younger the L2 AoA the more manner verbs were produced in L1. There were no significant correlations with path verbs or *other*-verbs. Another set of partial correlations determined the relationship between path, manner and *other* verbs uses in Spanish and L2 proficiency whilst controlling for AoA. Results yielded a significant positive correlation between L2 proficiency and L1 manner verb production ($r(31)= .406$, $n=34$, $p = .02$) suggesting that the higher the L2 proficiency the higher the use of manner verbs in Spanish. Path verbs and *other-verbs* did not correlate with L2 proficiency.

The previous analysis revealed that Spanish bilinguals had produced more path verbs than the Spanish monolinguals. We explored this finding by analysing more closely

the responses in relation to type of trajectory in stimuli. In Figure 2, we observed that both groups produced path and manner verbs for both types of trajectory events. As expected, in the trajectory stimuli, indeed both groups preferred manner over path verbs; also, they showed similar proportions. However, in B-C events, bilinguals showed steeper preference for path verbs than their Spanish monolingual peers. This difference was statistically significant: in Spanish monolinguals and bilinguals did not differ in their selection of path verbs (U = 626.00, p = .779) neither manner verbs (U=562.50, p = 2.59) in trajectory stimuli; however, they differed in their production of path verbs (U= 477.50, p = .05, r^2 = 0.05 small effect size) and manner verbs (U=412, p= .007, r^2 = 0.10 medium effect size) for B-C events.

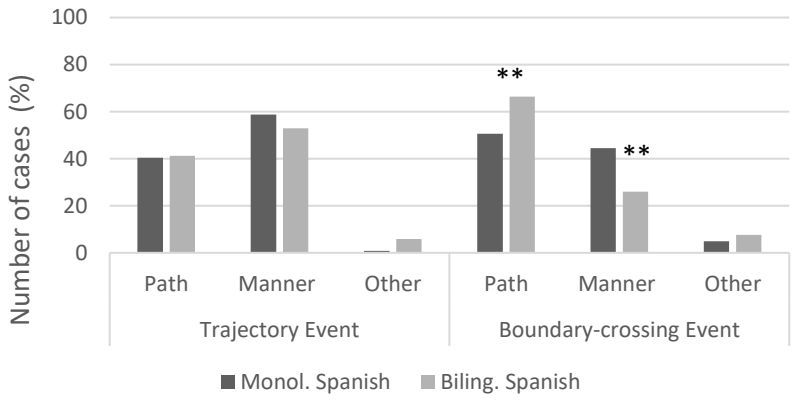

Figure 2. Average mean of type of verb selection according to type of stimuli (trajectory vs. boundary-crossing) in Spanish-speaking monolinguals and Spanish bilinguals

5.2 Clause Analysis

A total of 1311 clauses were scrutinised. For this analysis, the reader is referred to Table 4 for descriptive details and inferential statistics, and to Table 5 to observe examples of patterns produced by speakers of all language groups.

Table 4. Distribution of path and manner of motion in clauses in bilinguals and monolingual speakers

	Bilinguals in English		**Monolingual English**		**Mann-Whitney U results for English and r^2**	**Monolingual Spanish**		**Bilinguals in Spanish**		**Mann-Whitney U results for Spanish and r^2**
	No	%	No	%		No.	%	No.	%	
1. Total Path verbs	57	17.54	18	4.90		136	42.11	162	54.73	
Bare path	17	29.82	10	55.56	*U*= 690, *p* =0.08	44	32.35	49	30.25	*U*= 608.50, *p* = 0.5
Path_V+Manner	20	35.09	4	22.22	*U*= 603.5, *p*=0.00, r^2=0.11	72	52.94	93	57.41	*U*= 467, *p* = 0.03, r^2=0.07
Path_V+Manner+Path	7	12.28	1	5.56	*U*=728.5, *p* =0.03, r^2=0.05	0	0.00	0	0.00	*U*= 665, *p* = 1.00
Path_V+Manner+Manner	8	14.04	0	0.00	*U*=688, *p* = 0.00, r^2=0.10	20	14.71	20	12.35	*U*= 657.5, *p* = 0.93
Path_V+Path	5	8.77	3	16.67	*U*=789.5, *p* =0.38	0	0.00	0	0.00	*U*= 665, *p* = 1.0
Total		100		100			100.		100	
2. Total Manner Verbs	193	59.38	308	83.92		157	48.61	109	36.82	
Bare manner	71	36.79	90	29.22	*U*= 741.5, *p* =0.35	111	70.70	63	57.80	*U*= 392.5, *p* = 0.00, r^2=0.13
Manner_V+Path	83	43.01	154	50.00	*U*= 431.5 ,*p* =0.00, r^2=0.18	16	10.19	6	5.50	*U*= 488.0, *p* = 0.0, r^2=0.08
Manner_V+Manner+Path	11	5.70	23	7.47	*U*= 662.5, *p* =0.05, r^2=0.05	1	0.64	2	1.83	*U*= 644.5 , *p* = 0.51
Manner_V+Path+Path	1	0.52	25	8.12	*U*= 467.5, *p* = 0.00, r^2=0.23	7	4.46	0	0.00	*U*= 542.5, *p* = 0.01, r^2=0.10
Manner_V+Manner	27	13.99	16	5.19	*U* = 645., *p* = 0.04, r^2=0.05	22	14.01	38	34.86	*U*= 485, *p* = 0.03, r^2=0.06)
Total		100		100			100		100	
3. Other / motion related	64	19.69	30	8.17		3	0.93	20	6.76	
4. Other/ non-motion related	11	3.38	11	3.00		27	8.36	5	1.69	
Total number clauses	325	100	367	100		323	100	296	100	1311

Table 5. Motion event examples of sentences produced by language groups

	Monolingual English	**Bilinguals in English**	**Monolingual Spanish**	**Bilinguals in Spanish**
Path verb clauses				
Bare path	A person *enters* path the building	A person *enters* path the building	El *entra* path a una casa [he enters into a house]	La chica *cruza* path la mesa [the girl crossed the table]
Path_V+manner	The person*'s entered* path the building hopping manner	A woman *is crossing* path a door running manner	Una chica *entra* path saltando manner a un edificio [A girl enters jumping into a building]	Entró path brincando manner al cuarto [(she) entered jumping into the room]
Path_V+manner+path		A woman *enters* path in circles manner into path a room		
Path_V +manner +manner		A woman *enters* path a building jumping manner on one foot manner	El sube path la escalera andando para atrás manner de culo manner [he ascends the stairs walking in reverse with his butt]	Una mujer (está) *entrando* path a un adificio mientras brinca manner con una pierna manner [A women (is) entering a building while she jumps with on leg]
Path_V+path	Man [is] *entering* path through path a door	A person *enters* path through path the door from left to right		
Manner verb clauses				
Bare manner	A man *is walking* manner	A girl *is jumping* manner	Una chica *dando vueltas* manner [A girl turning around]	Un hombre *está saltando* manner [a man is jumping]
Manner_V+path	A man just *walked* manner out path of a room	A woman *hops* manner as she enters path a building	Una chica *está corriendo* manner a través path de una puerta [A girl is running across a door]	(Ella) *salta* manner para entrar path a un edificio/ [(she) jums to enter a building]
Manner_V+manner+path	A lady *walks* manner across path the corrido	A lady *walks* manner across path the corridor of a sport centre in a 360 degrees spinning motion manner		
Manner_V+path+path	A *girl jogg*ing manner through path a door into a room	A woman *skipped* manner out path the room through a door		
*Manner_V+m*anner	Boy *frog-hopping* manner side to side manner and forward	A girl *jumping* manner in a funny way	(El) salta manner de forma circular manner en la cancha [he jumps in a circular way in the court]	Una mujer *camina* manner dando vueltas sobre sí manner misma girando manner hacia su izquierda [A woman walks circling herself, turning to her left side]

5.2.1 Bilingual speakers' performance in English

Table 4 reports the percentages and raw frequencies for the different types of constructions. The total percentage observed for path and manner, highlighted in grey in Table 4, is broken down into the combinations of path and manner produced for that type of verb. Thus, in English, bilinguals produced a total of 57 path verb sentences (which constitutes the 17.54 % of all the sentences), of which 29.82% were bare path verbs, and so on. O*ther*-verbs were not analysed internally.

In relation to path verbs (henceforth, path_V), the preferred pattern for English monolinguals was bare path verbs followed by *path_V+manner* combination. The preferred order of patterns for this group was:

bare path verb > path_V + manner > path_V+ path

In English, bilinguals showed a slightly different order of preference:

Path_V+ manner > bare path verbs > path_V+ manner + manner and
path_V+ path + manner > path_V + path

In English, bilinguals produced much more path_V+ manner combinations than monolinguals, and in general, more path verbs containing manner descriptions, one or more. The key observation here is that in English, bilinguals produced path verbs in combination with manner expressions; these are mainly gerunds attached to romance-origin path verbs (e.g., enter, exits, etc; see Table 5). The picture for monolingual English speakers is different, where more than 70% of path verbs were bare forms. These patterns were compared between the two groups by means of Mann-Whitney U tests showing significant differences for all patterns, except for path_V+path, which had very low frequencies of use for both groups.

When observing sentences headed by manner verbs, the preferred order of pattern was somehow similar in both language groups. The order of preference for English monolinguals was:

Manner_V+path > bare manner verbs > manner_V+manner+path and manner_V+path+path > manner_V+manner

In English, the preferred order for bilinguals was:

Manner_V+path > bare manner verbs > manner_V+manner > manner_V+manner+path > manner_V+path+path

Mann-Whitney U tests comparing the production of each pattern between the two groups showed that English monolinguals produced significantly more manner verbs in all combinations except for *manner_V+manner* where bilinguals produced more (see Table 4). There were no significant differences for manner bare verbs (see examples in Table 5). Interestingly, for bilinguals, the least frequent pattern was manner_V+path+path; which was more frequently used by their monolingual peers (see Table 4). Some uses of this pattern are expected in English, as this language can stack paths within the sentence. In bilinguals most of the path components were prepositions as expected in English. However, we observed some examples where path is expressed in subordinate clauses, as in *a woman hops[manner_V] as she enters[path] a building*. This structure seems more typical for Spanish than for English because path is encoded in the main verb.

Bilinguals also significantly differed from English monolinguals by their higher production of *other* verbs-related to motion (see percentages and statistical results in Table 4). This high percentage of *other*-verbs happened only when bilinguals did the task in English (see (5)).

(8) *A girl goes into a room happily jumping, running*

In summary, the results of these analyses suggest that in English, bilinguals showed some differences from English monolinguals. In relation to structures headed by path verbs in English, bilinguals produced significantly more path verbs in combination with manner components than monolinguals, while for monolinguals it was path bare forms. In relation to structures headed by manner verbs, bilinguals seemed more similar to English

monolinguals in terms of order of preference; although, importantly, bilinguals preferred producing manner_V+manner more than English monolinguals. English monolinguals instead produced more manner_V+path+path. Despite the order of preferred patterns presented just few differences, the frequencies of production between groups did show significant differences. In English, bilinguals produced all the patterns significantly in less proportion than their monolingual peers except for manner_V+ manner which was highly used in bilinguals compared to monolinguals in English, and bare manner verbs, where there were no differences. Therefore, it seems that English monolinguals produced more manner verbs in combinations with one or more than one path satellite, than bilinguals. One explanation for this observation is that bilinguals are still learning the use of path prepositions in English. Evidence for this hypothesis is the fact that in English bilinguals produced a 10.7% of coordinated sentences containing manner and path main verbs of the total, while English monolinguals produced 6.6% of the total.

5.2.2 Bilingual speakers' performance in Spanish

Moving to the analysis of Spanish, we observed some differences between the two language groups. In relation to path verb structures, see table 4, Spanish monolinguals and bilinguals showed the same order of preferred patterns:

Path_V+manner > bare path verbs > path_V+manner+manner

The Mann-Whitney tests comparing these patterns between the two language groups actually showed that in Spanish, bilinguals significantly produced less bare path verbs and more path_V+manner than their Spanish monolingual peers (see examples in table 5).

As for Spanish, bilinguals and monolinguals showed a similar order of preference in relation to sentences headed by manner verbs:

bare manner verbs > manner_V+manner > manner_V+path.

However, bare manner verbs were produced in more than 70% of the cases by Spanish monolinguals, suggesting that this was the favourite patterns when manner headed a clause. In bilinguals, bare manner verb is also the preferred pattern (57.80%), but the percentage of production is significantly lower compared to Spanish monolinguals (see results in table 4). Spanish monolinguals also significantly produced more manner_V+path than their bilingual peers; but in Spanish, bilinguals significantly produced more manner_V+manner than Spanish monolinguals (see results in table 3).

In relation to patterns with *other*-verbs (related and non-related to motion), the proportions for each groups differed statistically. In Spanish, bilinguals produced significantly more *other*-verbs (motion-related) than Spanish monolinguals (U= 407.500, p = .000, r^2=0.19), the latter produced significantly more *other*-verbs (non-motion event related) that the first group (U= 410.00, p = .001, r^2=0.16). These differences were unexpected and could be related to the bilingual nature of the speakers. Non-motion event related expressions could be expected in Spanish, as this language could focus on describing static sceneries (Slobin, 1996a). However, this idea needs to receive proper attention in future studies.

Unusual structures were also observed in the Spanish of bilingual speakers. However, we just noted the fact that such structures occur, albeit rather infrequently. They will need to be analysed in future studies of motion. For example, we observed paths encoded in prepositions that seems more typical in English than in Spanish. The use of the preposition *a través* ("through") in combination with the adverb *debajo* ("under") in (9) is ungrammatical in Spanish where only one of these options is acceptable.

(9) *Una chica gatea a través debajo de una mesa* *[manner-V]* *dando vueltas* *[manner-satellite]*
'a girl crawls through under the table circling'

In summary we observed in Spanish, first, that despite the fact that bilinguals showed a more typical pattern of expressing paths in verbs, as expected in V-languages, internally in the clause there were differences with monolinguals. Bilinguals presented more elaborated descriptions of manner by giving extra manner specifications. Secondly, as a consequence of this feature, bilinguals produced less bare path and less bare manner verbs, which are very

characteristic of the Spanish language. Potential explanations will be put forward in the discussion.

6. Discussion

We studied L2 learning and bidirectional crosslinguistic influence in ME construal in a L1-V-language L2-S-language combination. Specifically, we analysed up to what degree Spanish-English bilinguals may internalise L2 conceptualisation patterns, and whether learning this L2 would influence L1 patterns. Moreover, we looked at whether bilingual speakers' L2 proficiency and AoA were related to the productions of these ME patterns of conceptualisation in both of their languages.

6.1. The L2 (English) in bilingual speakers

As expected, bilingual speakers showed a preference for describing MEs with manner verbs in English. This result was expected as our speakers are advanced-intermediate and advanced L2 English speakers. However, bilinguals differed statistically from English monolinguals in terms of the frequencies of verb use. They produced less manner verbs and more path and *other*-verbs than English monolinguals. Related studies on the same language-typology combination reported similar results for advanced proficient speakers of English (Brown and Gullberg's studies on Japanese-English speakers; Alonso, 2020). Interestingly, L2 proficiency and AoA played a role. Speakers that who learnt English earlier and had higher L2 proficiency produced more manner verbs. These two variables were likely to exert their influence independently of each other, as revealed by the partial correlation analyses. The effect of proficiency on native-like motion event patterns is well documented (see section 2.3 in this study). However, the effect of AoA on L2 learning is controversial not only for theoretical reasons, but also because this variable is difficult to disentangle. For example, this variable is difficult to disentangle from proficiency. Nonetheless, more recent neuropsychological studies have provided support for the hypothesis that AoA can modulate L1 activation during L2 processing. According to theories based on the notion of entrenchment (see Berghoff et al. 2021), the earlier a L2 is

learnt, the less the L2 depends on the L1. As a consequence, the L2 system is more independent, less connected to L1 representations, leaving bilinguals with better control over the two systems (a detailed discussion on the effect of proficiency and AoA, see Berghoff et al. 2021). Thus, the observed effect of AoA in our study could also be explained under this hypothesis of entrenchment, that is, as less interference from L1 on L2 in earlier L2 acquirers.

So far, the findings suggest that bilinguals have learnt the preferred lexical pattern in the L2, that is, that manner is expressed in the verb position; but the use is not native-like. At this stage, bilinguals' strategies seem to be to compensate by producing neutral verbs and the typical L1 path_V pattern (i.e., L1 transfer); for example, observe that the production of *other*-verbs is slightly higher than that of path-verbs. We think this high production of *other*-verbs is connected to the process of learning English as this feature is observed only in this language. Bilinguals probably lacked the specific lexicon to express manner, therefore, relying on highly frequent neutral verbs to express these manner components (see Alonso, 2020 for a similar hypothesis).

In relation to clauses, in English bilinguals showed the same patterns English monolinguals produced, but they used them in some different orders and frequencies. Specifically, bilinguals' most frequent English patterns were combinations of path_V and manner_V sentences with internal components of manner (one or more). These frequencies were significantly lower in English monolinguals. Although the later outnumbered bilinguals in the rest of patterns that turned out to be significantly different. Thus, we observed three different features in the bilinguals' L2: first, they learnt English ME patterns but not to the statistical frequencies and preferred orders by monolinguals; this is evidenced by the statistical differences between groups, and also, by the effect of AoA and L2 proficiency found in the data. Secondly, there seemed to be an interference of manner internally in the sentence. As discussed in the background section, manner is expressed internally in the predicates in Spanish and V-languages, but it is not necessarily the preferred pattern. We hypothesised that bilinguals' L2 evidenced a combination of a L2 learning feature (i.e., manner needs to be semantically expressed in English) together with syntactic transfer (i.e., manner is expressed in Spanish typically as a satellite). Thirdly, bilinguals produced significantly less path components internally in the sentences compared

to English monolinguals, particularly observed in the analysis of manner_V's patterns. It is likely that these speakers are still learning the use of path prepositions and the ability to stack paths to describe different components of a motion event in a single structure. This is also evidenced in the higher number of coordinated clauses in bilinguals compared to English monolinguals.

6.1. The L1 (Spanish) in bilingual speakers

In Spanish, bilinguals showed similar verb productions and order of preference patterns to Spanish monolinguals. Moreover, in Spanish bilinguals showed patterns more closely related to a prototypical V-language than Spanish monolinguals; that is, they chose significantly less manner verbs than their Spanish monolingual peers; the difference seems to be related to B-C stimuli, where in Spanish bilinguals behaved more prototypically as V-language speakers than the monolingual group. The preference for less manner verbs was found to be linked to L2 proficiency and L2 AoA; more manner verbs were produced by bilinguals with higher L2 proficiency and with earlier L2 AoA. This result, as revealed by partial correlations, is very interesting because it shows an independent effect of L2 on L1 that is not observed in the overall analysis of verb types.

The analyses of clauses in Spanish revealed two findings that could indicate effect of L2 on the L1 in bilinguals. First, Spanish monolinguals produced significantly more bare manner verbs than bilinguals. We know that this a typical characteristic of V-languages (see section 2.1). But bilinguals, as opposed to Spanish monolinguals, created more elaborated descriptions of manner by adding more than one manner component in sentences headed by path and manner verbs. These manner descriptions inside the clause seem to help specifying more precisely the manner of motion. It is likely that certain stimuli had triggered more manner descriptions than others due to their nature; for example, trajectory stimuli, or some stimuli showed manner components that have not specific lexicon to be encoded in the language; in these cases, speakers could feel the need to provide more detail of the manner of motion). However, monolinguals showed less interest than bilinguals in providing these extra descriptions. This bilinguals' behaviour is more expected in English than in Spanish. We suggest that in Spanish bilinguals are showing reverse transfer of

manner concepts. Manner of motion seems to be penetrating the Spanish L1 system: not only more manner verb structures (typically from English) appeared in the L1, but also there seems to be a higher attention to concepts of manner, as indicated by the high production of this component also internally in the sentence.

In conclusion our main findings support the hypothesis of bidirectional cross-linguistic influence of motion event conceptualization in speakers of a L1 V-language- L2 , S-language, at advanced-intermediate and advanced L2 proficiency. We observed processes of restructuring in the bilingual L2, but also L1 transfer. L1 Transfer is not only present at the level of verb choices, but also internally in the clause. L2 proficiency and AoA seem to play a role in the learning process of these patterns. Additionally, our study supports the hypothesis that learning a typologically different L2 has an effect on the L1 motion event patterns. We reported in the L1 of bilinguals some structural and conceptualization patterns that seems to emerge from the contact with the L2. As observed in the analysis of the L2 in bilinguals, these transfer features seem to be modulated by both L2 AoA and L2 proficiency. The fact that we observed in both L2 and L1 similar tendencies to overproduce manner of motion internally in the sentence could be considered a case of convergence.

These findings have important pedagogical implications suggesting first that teaching motion event in classroom could help overcome the difficulties learners of a different typological language encounter. The topic of motion event construal is not taught in current English curriculum and this and similar studies in SLA are providing evidence that learning these lexical and grammatical patterns are difficult even at advanced levels of proficiencies. The specific patterns observed in the L2 of our participants shed light into the specific aspects that could be included in teaching classroom activities. We observed in participants a deficiency in L2 motion event lexicon and lack of awareness of the type of ME syntactic structures in the L2. Therefore, we think that future research should pay particular attention into 1) create a better description of the features observed during the acquisition of ME construal, with special control on type of learner (AoA, L1 typology, L2 typology , level of proficiency); 2) design intervention studies to teach ME structures in classroom and to determine the most successful teaching approaches. So far, the information we have about the effective pedagogical approaches to teach these structures in classrooms remains insufficient (see for example, Laws et al. 2021; and Anastasio 2022).

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