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Abstract

The study examines the production of sentences describing motion in L2 learners, focusing on progress in learning verbal constructions, i.e. pairings of verbs of motion and their compatible syntactic frames in English and French. This is an important issue because verbs that are translational equivalents in the two languages do not necessarily share syntactic frames. Following the idea that the overall meaning of a verb is composed of its core meaning and structural meaning, we expected that after associating translational equivalents from L1 and L2, language learners would progressively associate L2 syntactic frames to the core meaning of the verb. However, this was only true for learners of French. Learners of English did not show improvement in sentence production corresponding to their proficiency level.

1. Introduction

Constructionist approaches define constructions as conventionalised pairings of form and semantic or discourse function, emphasising that constructions are learned on the basis of the input and general cognitive processes. In this chapter we focus on the acquisition of verbal constructions defined as pairings of verbs and compatible syntactic frames, assuming that syntactic frames are equivalent to argument structure constructions. Despite the initial belief that verbs dominantly influence the overall meaning of verbal constructions (e.g. Healy & Miller, 1970), there is evidence that argument structure constructions contribute as much as verbs to the overall sentence meaning (e.g. Bencini & Goldberg, 2000; Kaschak & Glenberg, 2000). Furthermore, it has been shown that second language (L2) learners rely on the argument structure constructions more than on the verbs when determining the meaning of verbal constructions. The reliance on constructions increases with the increase in L2 proficiency (Liang, 2002). The current study examines the acquisition of verbal constructions consisting of verbs of motion and compatible syntactic frames in L2 English and French. Just like for most verbs, the meanings of verbs of motion are modified by the syntactic frames they are inserted into. For instance in French, *descendre* means to *go down,*

(1) *Je descends les escaliers*.

I go-down the stairs

'I am going down the stairs.'

Yet, inserting *descendre* in a different syntactic frame alters its meaning,

(2) *Je descends les bouteilles à la cave*.

I go-down the bottles to the cellar

'I am bringing the bottles down to the cellar.'

Sentence (1) describes the motion of the grammatical subject of the sentence while sentence (2) describes the motion of both the grammatical subject and the direct object of the sentence.

This is an example of verbal polysemy where the meaning of a verb is modified by the syntactic frame. In order to account for verbal polysemy without introducing a separate lexical entry for each specific meaning "dichotomy" of verb meaning was introduced (Antonijević & Berthaud, 2009). It proposes that the overall meaning of a verb is composed from the core meaning of the verb represented by its root and the structural meaning or meaning of the event structure represented by the syntactic frame that accompanies the verb (Goldberg, 1995; Levin & Rappaport, 1995; Rappaport & Levin, 1998). Whereas the projectionist approach suggests that the representation of event structures are stored with the same lexical representation as the root (Levin & Rappaport Hovav, 2005), Construction Grammar gives more independence to structural meaning and proposes that syntactic frames are independent constructions, i.e. argument structure constructions which have their own lexical representations (Goldberg, 1995, 2006).

While the dichotomy of verb meaning was proposed, based on the processing and representation of verbs in monolingual speakers, it opened some very interesting questions with respect to acquisition and representations of an L2. In most cases words in L1 have their translational equivalents in L2. However, the situation with verbs does not seem to be that simple. If we examine translational equivalents for a verb in any two languages, there are four possible combinations that an L2 learner might encounter. The first possibility is that roots and syntactic frames are equivalent in L1 and L2. For instance:

(3) *Il monte les escaliers*.

he climbs the stairs

'He is climbing the stairs.'

Second, translational equivalents in L1 and L2 can be paired with a different syntactic frame to convey the same meaning:

(4) *Il fait sauter le cheval au-dessus de la clôture*.

he makes jump the horse over the fence

'He is jumping the horse over the fence.'

While *sauter* can be transitive in French, it cannot be used to indicate *jump + something + place*. The third possibility is that the roots in L1 and L2 are not translational equivalents, but entirely different verbs that require structurally equivalent syntactic frames:

(5) *Il a tiré une ligne*.

he pull.ed a line

'He drew a line.'

When (5) is translated literally into English, the intended meaning differs. The literal translation (in the glosses) implies that someone physically pulled a line instead of drawing a line. Instead, to convey a meaning similar to (5), a different verb, *draw*, must be inserted into the same syntactic frame. Lastly, to convey the same meaning in the two languages, both different roots and different syntactic frames may be needed:

(6) *Il descend la rue*.

he descends the road

'He is walking down the road.'

Both the French and English forms in (6) detail the direction of movement. However, English speakers prefer to describe such motion events by using a manner-of-motion verb and a prepositional phrase detailing the direction of motion, as shown in the idiomatic translation in (6).

Given the four possibilities outlined above, L2 learners have to associate the L1 and L2 translational equivalents of the verb root followed by separately associating compatible syntactic frames with the L2 verb. In other words, they would have to learn a set of pairings of the translational equivalent and syntactic frames that are compatible with the verb in L2. Much research has been carried out on how pairings of verbs and syntactic frames are

acquired in L1, but little work has been pursued in the area of second language acquisition (Cadierno, 2004). The present chapter is an attempt at bridging this gap.

The first part of this chapter will present the typology of verbs of motion developed by Talmy (Talmy, 1991), which is based on the idea that speakers of English and French use different patterns to describe motion events. Talmy argues that in English, speakers frequently pay attention to the manner of movement, which is usually encoded in the verb, and specify the location of the event in the verbal phrase. On the other hand, in French the verb encodes the path of motion while manner can optionally be added in a verbal phrase. For L2 acquisition, this would mean that a native English speaker learning French would need to pay attention to the path of motion and learn to lexicalise it with a verb. French native speakers learning English as an L2 would need to pay attention to the manner of motion and encode it in the verb. Talmy's typology, however, does not provide a detailed account of motion description: it has been observed that speakers of some languages can have recourse to several linguistic patterns to describe motion events (Slobin, 2004). Thus, Slobin (2004) argued for a slightly different approach and proposed a degree of manner salience to which speakers of a given language pay attention. Furthermore, in the case of French, work carried out by Pourcel and Kopecka (2006) has shown that this is not always the case and that the typology of motion in French is more varied than originally thought. They argue for a cline of salience of manner of motion that comprises five main constructions used by native French speakers.

The second part of this chapter will discuss L2 acquisition of verbal constructions of verbs of motion. As mentioned at the beginning, syntactic frames that are associated with translational equivalents in two languages are not necessarily the same. L2 learners must learn to recognise those differences in verbal constructions and, where necessary, they must form alternative constructions (Goldberg, 2010). This fact opens a series of interesting questions regarding L2 acquisition. For example, when learning L2, do we first learn the equivalent

syntactic frames? Do verbal constructions from L1 influence acquisition of non-equivalent pairings of translational equivalents and syntactic frames in L2? How are the meanings of verbs represented in the L1 and L2 mental lexicon, given the non-equivalence of pairings of verbs and frames in different languages? Does the acquisition of L2 change the representation of verbs in L1? So far, L1 verbal constructions have been shown to influence L2 production and comprehension (Cadierno, 2008) even with very advanced L2 learners (Hendriks, Hickmann, & Demagny, 2008). In addition, research suggests that L2 patterns can influence L1 production (Liang, 2002).

Thirdly, it will be shown that the experimental results presented here suggest that the sentences depicting motion events produced by L2 learners can be explained by employing the idea of the dichotomy of verb meaning. For this study, this implies that L2 learners gradually associate verbs and argument structure constructions, which they learn to generalise before acquiring further verbs and constructions. This would correlate with the exposure to L2 and to the proficiency of the learner. This would also mean that the productions of a more proficient learner would resemble more closely that of the native speaker than that of his/her native language. On the other hand, the productions of a less proficient learner would resemble that of his/her native language. Lastly, L2 learners need to acquire both the verb root and the compatible construction in the L2 to produce correct sentences. Because the pairings of verb roots and compatible constructions can be different in L1 and L2, an L2 learner faces the task of recognising such differences, overcoming the influence of his L1, and acquiring such pairings.

Finally, an account of the implications of L2 acquisition of verbs and syntactic frames for the organisation of the bilingual lexicon will be presented. We will argue that the Revised Hierarchical Model (Kroll & Stewart, 1994) is best suited to account for the results discussed.

2. Typology of motion patterns

The typology of the lexicalisation patterns for motion events developed by Talmy divides languages into two categories depending on the preferred way to encode motion: a) verb-framed and b) satellite-framed languages (Talmy, 1991). Verb-framed languages encode the path of motion in the verb itself while an optional manner of motion can be added in the form of a prepositional phrase. Romance languages such as French are examples of verb-framed languages. Satellite-framed languages, on the other hand, encode the manner of motion in the verb and the location can be added in an optional prepositional phrase. English is an example of satellite-framed languages.

For instance in French, sentence (14) is ungrammatical,

(7) **J'ai volé à Paris*.

I have flown to Paris

'I flew to Paris.'

The following pattern is used instead:

(8) *Je suis allé à Paris en avion*.

I have gone to Paris by plane

'I went to Paris by plane.'

Note that the prepositional phrase expressing manner in (8) "en avion" is optional and only needs to be added when manner needs to be overtly expressed, like in the case of stressing that the journey was not undertaken by any other form of transportation.

However, research done by Slobin (Slobin, 2004) pointed out that such a typology does not account for all production patterns encountered in a given language and indeed it is possible in French to encode manner of motion in a verb:

(9) *J'ai couru jusqu'à la porte*.

I have run until the door

'I ran to the door.'

Yet, this type of constructions is not a frequent occurrence in French (Kopecka, 2009). In the same way, it is possible to encode path in a verb in English:

(10) I left the room.

Occurrences of this type of verb are not frequent in English (Talmy, 2000b).

A study carried out by Berman and Slobin (1994) showed that the way motion is lexicalised in a given language influences the way native speakers of that language describe motion. In particular, speakers of satellite-framed languages tend to provide complex descriptions of path while describing motion (event conflation) and to provide rich and detailed descriptions of the manner of motion (Berman & Slobin, 1994). Berman and Slobin concluded that speakers learn whether to pay particular attention to manner depending on the language they speak. This means that the manner of motion is very salient in a language for which manner of motion is lexicalised, such as English. In contrast, the manner of motion is not salient in a language for which manner of motion is not lexicalised, like in French.

Studies of L1 acquisition have revealed that children use linguistic patterns similar to those of adults of their L1 (Bowerman, 2007; Hickmann & Hendriks, 2010). However, the results are different for L2 acquisition. Studies of L2 acquisition of caused motion verbal constructions indicated that L2 learners can produce grammatically correct sentences without following the typological pattern of L2. In a narrative production task, English native speakers with three levels of proficiency in French as their L2 were recruited to describe caused-motion events in their L2. The lower proficiency learners showed a tendency to use manner verbs with incorrect prepositional phrases or to use path verbs without lexicalising all the elements of the verb phrase. Higher proficiency learners were more successful at describing caused motion events and used more complex structures. However, while their L2 productions

were grammatically correct, they did not correspond to typical French sentences. Instead of using a prepositional phrase lexicalising the manner of motion, L2 learners encoded the path of motion in the verb phrase (Hendriks *et al*., 2008).

More recent research shows that the distinction between verb-framed and satellite-framed languages appears not to be as categorical as previously thought. In their study, Pourcel and Kopecka (2006) have shown that the typology of motion in French is more varied than suggested by Berman and Slobin (1994). When eliciting descriptions from French native speakers, Pourcel and Kopecka recorded that only 67% of the sentences produced encoded path in the verb. They revealed that French native speakers use diverse patterns (Pourcel & Kopecka, 2006).

In addition, the path of motion in French can be encoded through the use of prefixes instead of the verb root (Kopecka, 2006). For instance, in the following sentence, the verbal prefix encodes the path of motion while the verb encodes the manner of motion:

(11) *Il* ***re-****tourne* *le* *livre.*
he over-turns the book
'He is turning the book over.'

This example shows that French native speakers use diverse constructions to describe motion events, supporting the results shown by Hendriks *et al*. (2008).

We suspect that this variety of verbal constructions used for expressing motion in French should influence L2 processing and L2 acquisition: native French speakers might try to lexicalise the manner of motion through prefixes in English; native English speakers might not be aware of such a process in French and try to lexicalise the manner of motion with prepositional phrases instead.

3. L2 acquisition of verbal constructions

It is commonly assumed that the L1 and L2 lexicons contain translational equivalents. However, as pointed out above, verbs can have a rather complex relationship with their translational equivalents. Given that the overall meaning of verbal constructions is determined both by the verb and by the construction, only some proportion of verbal constructions that consist of the same verb and the same syntactic frame in L1 and L2 are going to be translational equivalents. Others will differ in either the verb or the construction, or both. Having this in mind, the question is how verbal constructions are represented in the L1 and L2 mental lexicons. One possibility is that each specific meaning of a verb is separately represented in the L1 mental lexicon and associated with its translational equivalent in the L2 lexicon. Having this type of architecture in the mental lexicon would exponentially increase the number of lexical units in a monolingual, but especially in a bi- or multilingual lexicon. In addition, L2 learners would have to simultaneously acquire the L2 verb and compatible syntactic frame in L2 equivalent to the particular meaning of the L1 verb and its syntactic frame. However, empirical studies are pointing out towards a relative independence of verbs and syntactic frames in acquisition of L2. For example, it has been documented that L2 learners often produce sentences that reflect structures of both their L1 and L2 at one and the same time (Cadierno, 2008). For example, the data collected reveal that French speakers were confused when asked to produce a sentence in English to describe the act of *climbing down*. In French, *to climb* is translated by *monter,* which implies an upward motion. Many of them commented, "To climb down does not make sense" and then produced the following instead (Berthaud & Antonijević, in preparation),

(12) The man is going down the tree.

If we apply the proposed dichotomy of verb meaning to the acquisition of L2, it would mean

that as the overall meaning of verbal constructions in L1 is constructed from the core meaning represented by the verb root and the structural meaning represented by syntactic frames, L2 learners can separately acquire the core meaning of a verb and then learn to associate it with compatible syntactic frames to convey specific meanings, and in that way form L2 verbal constructions. This raises the issue of strategies that L2 learners use to correctly acquire various combinations between pairings of verb root and syntactic frames in L1 and L2. A study by Liang (2002) examined whether L2 learners pay more attention to roots or to syntactic frames. Three groups of Chinese native speakers having advanced, intermediate and beginner levels of proficiency in English as an L2 were recruited to take part in a sorting task experiment. The participants were presented with sentences containing a verb in four different constructions and asked to sort the sentences according to their overall meaning. The results showed a correlation between language proficiency and recognition of constructional generalisations. The study indicated that more advanced L2 learners pay more attention to constructions than verbs when determining the meaning of verbal constructions.

4. Second language acquisition and motion in English and French

In the current study we examined the acquisition of verbs of motion in L2 English and French. The present research aimed at determining whether L2 learners would exhibit any effects of progressive learning of pairings of verb roots and compatible syntactic frames during sentence production. It was expected that a higher level of proficiency in the L2 would correlate with a higher number of acquired verbal constructions for a particular verb in L2. In addition, more proficient learners were expected to produce sentences closer to native productions in L2.

3. 1. Participants

In order to examine whether pairings of verbs and syntactic frames are acquired progressively in L2 and whether their acquisition depends upon language, the current study included four groups of participants: two groups of advanced learners, one of L1 English speakers learning L2 French and one of L1 French speakers learning L2 English, and two groups of upper-intermediate learners, one of L1 English speakers learning L2 French and one of L1 French speakers learning L2 English. Each group included 10 participants. The participants were asked to produce sentences in their L2 to describe custom-made pictures. The participants' level of proficiency in L2 corresponded to the B2 level for the upper-intermediate learners, while the advanced level learners matched the criteria of the C1 level (Council of Europe, 2001). Overall mean age was 29;8 years. All participants had spent some time in a country where L2 was spoken and all had received the same type of education (third level instruction).

3. 2. Stimuli

High-frequency English verbs together with their compatible syntactic frames were selected from the database developed by Gahl, Jurafsky & Roland (2004). Similar information was retrieved for high frequency French verbs and compatible syntactic frames from the *Lexique3.1* database (New, Pallier, Ferrand, & Matos, 2001; New, Pallier, Brysbaert, & Ferrand, 2004). Both databases provide the required information on lemma frequency, syntax and semantics. Custom-made pictures that depicted motion as represented by the verbs and all the arguments present in the syntactic frame were used to elicit sentence production. The task included 38 pictures and additional 15 pictures in the practice session.

3. 3. Procedure

The participants were instructed in their L1 to describe the presented pictures in the L2 using a specific verb they were given in their L2. For instance, when a participant was presented with a picture showing a car going up a hill, the participant was given the verb *go* to produce a sentence. The pictures were presented randomly. Before the actual testing, participants had a practice session during which they were exposed to fifteen pictures representing verbs that were different from those used in the actual stimuli.

Sentences were analysed for their grammatical correctness and also whether they corresponded to the model sentences. Grammatically correct sentences and sentences that corresponded to the model sentences were counted as correct. Ungrammatical sentences and those that did not correspond to the model sentences were subsequently qualitatively analysed.

3. 4. Results

The results showed that English speakers produced a larger proportion of correct sentences in L2 than French speakers [$F(1,39)= 29.096$, $p<0.001$ ($M_{Eng}=0.37$; $M_{Fr}=0.56$). In addition, the results suggested that L2 proficiency influenced accuracy in sentence production: advanced learners produced a larger proportion of correct sentences in L2 than upper-intermediate learners [$F(1,39)=16.76$, $p<0.001$ ($M_{u\text{-}i}=0.39$; $M_{adv}=0.54$)]. However, analysis revealed a significant interaction between the level of proficiency and language [$F(1,39)=9.768$, $p<0.01$]. Post-hoc analyses indicated a significant difference in accuracy between upper-intermediate and advanced learners of French [$F(1,19)=22.16$, $p<0.001$ ($M_{u\text{-}i}=0.43$; $M_{adv}=0.69$)] while there was no significant difference in accuracy for learners of English [$F(1,19)=0.57$, $p>1$ ($M_{u\text{-}i}=0.35$; $M_{adv}=0.39$)].

For English speakers learning French, the results revealed a significant difference in the proportion of correct sentences produced by the learners at the upper-intermediate and the advance level of proficiency for all five verbs: *aller* [$F(1,18)=15.68$, $p < 0.001$], *monter* [$F(1,18)=15.764$, $p < 0.001$], *sauter* [$F(1,18)=4.643$, $p < 0.045$], *tirer* [$F(1,18)=10.138$, $p < 0.005$], and *descendre* [$F(1,18)=4.84$, $p < 0.05$].

The results for French speakers learning English were varied: a significant difference in the proportion of correctly produced sentences by the upper-intermediate and the advanced learners was observed in the case of *pull* [$F(1,18)=6.444$, $p<0.03$] and *go* [$F(1,18)=0.567$, $p<0.5$], while no significant difference was observed for *jump* and *climb* [$F(1,18)=0$, $p>1$] [$F(1,18)=0.053$, $p>1$].

The results indicate that L1 English speakers learning L2 French acquired verbal constructions progressively: there was a significant increase in the number of sentences correctly produced by the advanced learners relative to the upper-intermediate learners. In contrast, L1 French speakers learning L2 English did not show any improvement in the production of verbal constructions with an increase in the proficiency level. Advanced L1 French speakers were not significantly better at producing correct pairings of verb roots and syntactic frames than upper-intermediate learners. These results could mean that acquisition follows different patterns for the two groups of learners studied here. Particularly, the data show that French native speakers had many difficulties acquiring the syntactic frames compatible with a given verb for a specific realisation. For instance, French speakers produced sentences such as:

(13) He’s pulling the door.

They translated that sentence as,

(14) *Il ouvre la porte.*

he opens the door

‘He is pulling the door open.’

To convey the meaning expressed in the translated sentence they should have produced something like

(15) The man is pulling the door open.

(16) The man is pulling open the door.

The core meaning of *pull* is different from that of *ouvrir/to open*. In addition, the syntactic frame varies across the two languages. Despite their high level of proficiency, L1 French participants showed a tendency not to produce that syntactic frame correctly in English. They mostly relied on the core meaning of the verb root to convey the meaning instead of using of syntactic frames to modify the meaning of the root. In another instance, instead of producing the following,

(17) The cat is jumping onto the table (boundary-crossing event),

L1 French participants produced,

(18) The cat is jumping on the table (activity).

Their productions were rather similar to the frame that would be used in their native language:

(19) *Le chat saute sur la table*.

Sentence (19) is ambiguous in French. It can either mean that the cat is jumping up and down on the table or that the cat is jumping onto the table. Unlike in English, boundary-crossing events are not encoded by a specific preposition in French (Slobin, 2004). Ambiguous sentences such as (19) are usually resolved from the context. It means, however, that native French speakers are not paying attention to these subtle differences and are therefore not sensitive to the distinction encoded by two different sentences in English. This is in line with previous studies, which indicate that French speakers have difficulties encoding boundary-crossing events in English L2, even at an advanced level of proficiency (Berthaud & Antonijević, in preparation; Treffers-Daller & Tidball, 2011).

Similarly, data from the same study show that L1 French speakers had difficulties using the verbs provided to produce sentences in English. Indeed, when given the verb *go*, very often L1 French speakers used the verb in the *going to + verb* construction. This enabled them to fulfil the task using a given verb and to employ a verb that would have been suitable in their first language. For instance, instead of producing

(20) The car is going up the hill,

they produced,

(21) The car is going to climb the hill.

Or instead of producing,

(22) The temperature is going down,

they produced,

(23) It's going to freeze.

Participants used the *going to + verb* as a compromising construction that enabled them to complete the task and follow the constraints of their L1. This strategy allowed L1 French speakers learning English to select a verb according to their L1.

English native speakers learning French did not seem to have such difficulties at producing sentences combining a verb root and a compatible syntactic frame in French. They were able to produce sentences such as

(24) *L' homme saute par-dessus le mur.*
the man jymps by-above the wall
'The man is jumping over the wall.'

(25) *L' homme descend la rivière en kayak.*
the man descends the river by kayak
'The man is kayaking down the river.'

The varied constructions used by English native speakers to talk about motion reflect they had

acquired path verbs (*monter* and *descendre*) and compatible constructions. In addition, as manner is salient in English, they provided additional information about manner in L2 (see sentence (25) above). However, L1 English speakers sometimes encountered difficulties in finding a compatible syntactic structure to produce a sentence. When unsure about the syntactic frame to be used to describe some pictures, they tended to use simple constructions like sentences (26), (28), and (30).

(26) **Il monte l' arbre*.
he climbs the tree
'He is climbing the tree.'

Instead of

(27) *Il monte à l' arbre.*
he climbs at the tree
He is climbing the tree.

(28) **Il monte le train*.
he climbs the train
'He is getting on the train.'

Instead of

(29) *Il monte dans le train.*
he climbs in the train
'He is getting on the train.'

(30) **Il descend le bus*.
he descends the bus
'He is getting off the bus.'

Instead of

(31) *Il descend du bus.*

he descends from.the bus

'He is getting off the bus.'

As exemplified above, L1 English speakers relied on the transitive construction of *monter* and *descendre* when they should have used intransitive constructions in all the instances mentioned. Some of the incorrectly produced simpler sentences were literal translations of verbal constructions from the L1, for example sentences (26) and (28). Yet, most of the incorrect simple constructions that L1 English speakers used do not exist in their L1. In fact, they were constructions typically used with the French verb they were given. For instance, in the case of sentences (26) and (28), *monter* is often used in the following construction,

(32) *Il monte la colline*.

he climbs the hill

'He is climbing up the hill.'

The transitive construction of *monter* indicates that someone or something is going up the length of something. In sentence (29) the intransitive construction is used to indicate that someone is climbing aboard a vehicle.

The same is observed with the transitive construction of *descendre* indicates that someone or something is going down the length of something (stairs, hill, etc.).

(33) *Il descend les escaliers.*

he is descending the stairs

'He is going down the stairs.'

The intransitive construction in (31) depicts the act of leaving a vehicle. This suggests that learners of French had acquired an L2 verb root and an L2 compatible syntactic frame, both of which they generalise to other incorrect productions as in (26), (28), and (30). This indicates that English native speakers acquire path verbs and constructions to describe the path of motion. In addition, some of the sentences produced by the L1 English speakers revealed that

they tried to encode motion in L2 in patterns similar to that of the L1. Some L1 English speakers produced the following in French,

(34) **Il va en haut à la forêt.*

he goes upstairs to the forest

'He is going up to the forest'.

This replicates findings of a study examining the expression of motion events in L2, which indicated that L1 influences the speaker's productions in L2 (Navarro & Nicoladis, 2005). This study compared the productions of L1 English speakers learning L2 Spanish, which is like French a low manner salient language. Results indicated that L1 English speakers learning Spanish as L2 produced sentences detailing the path of motion with more details than L1 Spanish speakers. Yet, the study also revealed that learners and native speakers did not differ significantly in the way they used path verbs.

The results presented above show that L2 learners can acquire roots and argument structure constructions independently of each other. In some cases, as in (37), the verb root is acquired but the compatible frame is not produced. L2 learners acquire a verb they use with a compatible construction and then generalise the use of that pairing. In other cases, an L2 construction is generalised and applied in instances when another construction should be used.

Furthermore, French learners progressively associate verbs and compatible syntactic frames, which was not the case for English. This suggests that there is either some characteristic of English that makes it difficult for L1 French speakers to learn or that some characteristic of their L1 French influences their capacity to produce English sentences correctly. Because the manner of motion is not a salient cue in verb-framed languages or low manner salient languages, it has been proposed that it could be more difficult for speakers of verb-framed languages to acquire the patterns of satellite-framed languages: it would be more complex to acquire more discriminating patterns than less discriminating ones (Cadierno,

2008).

Manner of motion is a cue used in satellite-frame languages to process and encode linguistic information; as such it is a discriminating pattern in English. Manner of motion being salient in satellite-framed languages would facilitate the acquisition of verb-framed patterns: manner of motion must be lexicalised in languages in which it is salient while it is covertly expressed in languages in which it is not salient. Thus it is difficult for native speakers of verb-framed languages such as French to acquire this pattern in the L2. This explanation is in line with the current study where L1 French speakers had difficulties producing correct sentences using manner-of-motion verbs and compatible constructions while L1 English speakers correctly produced path verbs and path constructions.

5. Organisation of the bilingual lexicon

One of the important questions that research on bilingualism aims to address is the organisation of the bilingual lexicon. Most models of the bilingual lexicon incorporate the existence of some form of translational equivalents, i.e. words that have roughly the same meaning that are linked across the L1 and L2 lexicons (Kroll & Stewart, 1994). However, lexical representations of polysemous verbs can be rather complex. Although verbs have their translational equivalents, the overall meaning of verbs interacts with the meaning of the syntactic frame they are integrated into. The compatible syntactic frames in L1 are sometimes structurally equivalent to the frames compatible with the verb's translational equivalent in L2 and in those cases they can be linked with L1 syntactic frames. Yet, when the structure of the syntactic frame is not shared across languages, L2 learners have to separately learn the translational equivalent to the L1 verb and subsequently associate it with a compatible

syntactic frame in L2. To make the architecture of the mental lexicon even more complex, some verbs have more than one translational equivalent depending on whether their specific meanings require a different verb root in L2 (see (13)). The results presented in the current study indicate that L1 English speakers acquire L2 French differently from the way L1 French speakers acquire L2 English. Because English and French encode motion differently, it is likely that lexical representations of verbs in the two languages include different types of information. For example, it has been shown that verbs representing the manner of motion have a simpler event template than change-of-location verbs (McKoon & McFarland, 2002; McKoon & Ratcliff, 2008). This would suggest that lexical representations of English motion verbs include a verb root that encodes minimal meaning which is not too constrained and as a result can be associated with many compatible syntactic frames. Following the same argument, lexical representations of French motion verbs include a verb root that is much more constrained as it describes a change of location and the direction of motion. As such, it is not as likely to be associated with as many syntactic frames as English verbs tend to be. Manner-framed (or satellite-framed) verbs are much more flexible in the type of syntactic frame they permit, thus in the current study L1 English speakers were more open to associating different syntactic frames with French verbs. As path-framed verbs are not as flexible, L1 French speakers showed a tendency to rely on the meaning of the verb rather than the meaning of the syntactic frame when trying to convey specific verb meanings. The fact that verbs seem to be more constrained in French because they contain more information is also reflected in the way motion was encoded through the use of prefixes in earlier French (Kopecka, 2006). Although the process of adding prefixes to create new meanings is no longer productive, many such verbs are still used in French nowadays. These prefixes are not used in syntactic frames any longer but have been incorporated into the verb and may even be integrated into the verb root.

It has been proposed for monolingual acquisition of pairings of verbs and syntactic frames that learners first acquire the most frequent verbs and compatible frames. This initial phase is subsequently followed by the generalisation of frames when learners start to combine established frames with new verbs (Goldberg, 2009). Error analysis of the data showed that L1 English speakers produced erroneous sentences in which they generalised previously acquired L2 constructions. This supports an independent association of verbs and syntactic frames in the L2 lexicon. It indicates that speakers acquired L2 constructions that were different from those of L1 and were able to access them without the support of L1. Furthermore, L1 English speakers were capable of using correct L2 syntactic frames without interference from their L1. This corroborates previous findings that show proficient L2 learners developing near-native comprehension processing strategies in their L2 (Jackson & Dussias, 2009). This suggests that proficient L2 learners develop specific L2 conceptual representations in their bilingual lexicon as envisaged by the Revised Hierarchical Model (Kroll & Stewart, 1994). The Revised Hierarchical Model proposes that L2 learners first access L2 representations through L1 and then progressively develop independent concepts in their L2.

The results from L1 French speakers provide a different account, however. The sentences produced by L1 French speakers indicate that French participants mostly relied on a verb to carry directional information. They showed a tendency to produce sentences in L2 using verbs and syntactic frames characteristic of their L1. They even used the *going to + verb* construction to be able to express the direction of motion in the verb root (e.g. *He is going to climb the stairs* instead of *He is going ups*tairs). This would suggest that L1 French speakers develop their English/French bilingual lexicon differently from L1 English speakers. The acquisition of English verbs and the association between translational equivalents across the two lexicons appears to be influenced by the existing constraints of their L1 lexicon.

Indeed, if translational equivalents of verbs share the same lexical representation in the bilingual lexicon and if French verbs are more constrained and more limited in the syntactic frames with which they are compatible, it is a possibility that French native speakers only associate the lexical representation of a French verb with its translation equivalent in English and pay less attention to the syntactic frames. This could explain why despite the fact that *go* can be associated with *up* to represent 'climb', French speakers preferred to use *climb* instead of *go up* and used the *going to* constructions in order to use the verb *climb*.

While errors made by L1 English speakers mainly reflected acquisition and overgeneralisation of constructions in French, some errors also reflected structures from their L1. For instance, instead of saying *Il monte à l'arbre*, they produced "Il monte l'arbre", a literal translation of *He is climbing the tree*. These results are in line with previous findings that revealed a syntactic priming effect from L1 to L2 during sentence production (Salamoura & Williams, 2007). Examining cross-language syntactic priming in a double object (DO) and a prepositional object (PO) structures in native speakers of Greek learning English as L2, Salamoura and Williams showed that syntactic priming did not occur with similar or different verbs, but interestingly did occur for both DO and PO structures. The priming effect depended on the similarity of the syntactic structures across languages and the thematic roles up to the first verb complement. This finding suggests that lexical representations of verbs are linked in the bilingual lexicon and share syntactic and thematic information.

The empirical studies presented above indicate that while L1 influences L2 acquisition and production, L2 learners are still capable of developing independent lexical representations in their L2. Furthermore, it has been shown that more proficient L2 learners produce sentences that closely resemble sentences in L2 produced by native speakers (Reichle, 2010). Accordingly, in the current study, L1 English speakers that are more proficient in L2 French produced sentences that resembled those of native French speakers. In contrast, L1 French

speakers produced sentences in L2 English that mostly resembled that of translational equivalents of their L1. In addition, the current study revealed a different pattern of L2 acquisition and bilingual lexicon development for L1 English speakers learning L2 French and L1 French speakers learning L2 English: L1 English speakers progressively acquired verbal constructions in L2 while on the other hand L1 French speakers did not acquire verbal constructions in a progressive manner. This suggests that patterns of acquisition of verbs and syntactic frames in L2 and the structure of bilingual lexicon most likely depend on the cross-lexical variation in the way motion events are expressed.

6. Conclusion

On the basis of the proposed dichotomy of verb meaning, we expected that L2 learners would first acquire frequent pairings of verbs and syntactic frames and then progressively associate other compatible syntactic frames with the L2 lexical representations of those verbs to convey their specific meanings. The results confirmed our predictions in the case of L1 English speakers learning French, but not in the case of L1 French speakers learning English. This outcome indicates that either there are some specific characteristics of the English verb syntax that make it difficult to acquire verbal constructions in English or that having French as L1 hinders acquisition of verbal constructions in English. A comparison of the way motion events are coded in English and French suggests that verbal constructions describing motion differ in the two languages. English is categorised as a satellite-framed or a high-manner-salience language while French is defined as a path-framed language or a low-manner-salience language. This difference has been shown to influence L1 English/L2 French and L1French/L2 English speakers' productions in a different way: L1 English speakers do not

have difficulties adopting a variety of French verbal constructions (Cadierno, 2008). On the other hand, French speakers exhibited difficulties when describing the manner of motion (Berman & Slobin, 1994). Therefore, we suspect that the difference in the structure of the most frequent verbal constructions describing motion in the two languages also influenced our results, which indicated that L1 English speakers learning French acquired verbal constructions in a progressive manner while this was not the case for L1 French speakers learning English. L1 French speakers seem to predominantly focus on acquiring verb roots that are translational equivalents of French verbs. Instead of forming verbal constructions using different syntactic frames with the same verb in English, L1 French speakers used different verbs with the same argument structure construction. It is possible that the variety of patterns describing motion events in French (Pourcel & Kopecka, 2006) prevented L1 French speakers from acquiring a variety of verbal constructions associated with the same verb in English. To further examine this issue it would be interesting to extend the current study to include a larger number of verbs and syntactic frames, taking into account all the varied verbal constructions available in French.[1]

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