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The Emergence and Production of the English Prepositions *in* and *of* in 2L1 Spanish/English Simultaneous Bilingual Children

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The work presented in this MA thesis is, to the best of my knowledge and belief, original and my own work, except as acknowledged in the text. The work in this thesis has not been submitted, either in whole or in part, for a degree at this or any other university.

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Abstract:

Some grammarians consider prepositions to be a hybrid category, since they do not conform entirely to either lexical or functional categories. Previous studies on child language acquisition have shown differences in the acquisition of lexical vs. functional prepositions in English. However, other studies show that this difference is not as marked in languages like Spanish. In the light of previous formal studies and acquisition works, this study analyzes the production of the English prepositions *in* and *of*, taking the former as lexical and the latter as functional, in the spontaneous longitudinal data from two Spanish/English simultaneous bilingual children. The aim is to determine whether the pattern of acquisition of English prepositions exhibited by Spanish/English bilingual children is similar to that of English monolingual children. The results suggest that the hybrid nature of prepositions may not affect the Spanish/English bilingual children as much as it affects the English monolingual children. This points to crosslinguistic differences in the acquisition of lexical and functional prepositions and to potential crosslinguistic influence effects from Spanish into English.

Keywords:

Prepositions, bilingual acquisition, English/Spanish, children, spontaneous longitudinal data, crosslinguistic influence

Resumen:

Algunos gramáticos consideran que las preposiciones son una categoría híbrida, que no se acomoda completamente a la categoría léxica ni a la funcional. Estudios previos sobre adquisición del lenguaje en niños muestran que existen diferencias entre la adquisición

de las preposiciones léxicas y las funcionales en inglés. Sin embargo, otros estudios argumentan que, en otras lenguas como el español, esta diferencia no es tan evidente. Teniendo en cuenta estos estudios previos sobre la naturaleza formal y la adquisición de las preposiciones, el presente estudio analiza la producción de la preposición inglesa *in*, entendida como léxica, y de la preposición inglesa *of*, entendida como funcional, en datos espontáneos y longitudinales de dos niños bilingües simultáneos español/inglés. El fin es determinar si los patrones en la adquisición de las preposiciones de los niños bilingües son similares a los de los monolingües. Los resultados sugieren que la naturaleza híbrida de las preposiciones parece afectar en menor medida a los niños bilingües que a los monolingües. Esto indica posibles diferencias entre lenguas en la adquisición de las preposiciones léxicas y funcionales y apunta a una influencia interlingüística del español al inglés.

Palabras clave:

Preposiciones, adquisición, bilingüe, inglés/español, niños, influencia interlingüística

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1. Introduction

Prepositions are often defined as words that link different parts of the sentence, and that are generally followed by a determiner phrase (DP) that functions as the complement of the preposition, as illustrated in (1) (e.g., Quirk et al., 1985). Prepositions are usually considered a closed category, which means that their number is finite and the incorporation of new members into the category uncommon. They should be, therefore, apparently easy to define.

(1) on [preposition] the table [DP] (Quirk et al., 1985, p. 657)

However, prepositions have been the subject of controversy in traditional grammar (e.g., Huddleston and Pullum, 2002 or Payne, 2011). The main controversy lies in how they are categorized as a word class: as a functional category (contributing mainly grammatical information to the structure) or as a lexical category (whose main contribution to the structure is lexical, semantic). So, while there is a clear consensus in the categorization of other word classes such as nouns (lexical categories) or determiners (functional categories), no agreement has yet been reached in the case of prepositions. Authors like Jackendoff (1973) defend the lexical nature of prepositions because they could project a prepositional phrase. Others, like Biber et al. (1999), defend their purely functional nature. Moreover, a third proposal has been put forward: authors like Mardale (2011), Zwarts (2011), or Bordet and Jamet (2010) have offered in the last decades

alternative analyses that point toward prepositions being a hybrid category, with some prepositions being lexical in nature, while others are functional.

Even considering the controversial nature of the word class (or maybe because of this), prepositions have been at times overlooked when it comes to characterizing their acquisition. In fact, the number of empirical studies on the acquisition of prepositions is lesser than that of other word types (e.g., determiners, adjectives) or other linguistic phenomena (e.g., subjects, objects, word order). Nevertheless, there exist some previous studies that have dealt with children's acquisition and production of prepositions in both simultaneous bilingual children (e.g., Klinge, 1990; Taliancich-Klinger et al. 2017) and monolingual children (e.g., Littlefield, 2005; Stewart, 2015). Works like those of Littlefield (2005) or Stewart (2015) explore prepositions in the very initial stages of acquisition, but only in English and Spanish monolingual children (i.e., children with one first language, L1). Other studies like that of Klinge (1990) explore these same initial stages in simultaneous bilingual children (i.e., children with two first languages, 2L1), in the specific case of the Italian/German language pair. Furthermore, studies like that of Taliancich-Klinger et al. (2017) explore the production of prepositions in 2L1 Spanish/English bilingual children, the same population targeted in the present investigation, although they do not explore the first stages of acquisition, but rather age 7 onwards.

Earlier studies on child language acquisition have shown differences in the acquisition of lexical and functional categories (e.g., de Villiers & de Villiers, 1973). Particularly, authors that advocate for a hybrid categorization of prepositions, have found differences in the production of prepositions considered lexical (like *in*) and those considered functional (like *of*) in English (e.g., Littlefield, 2005). Findings suggest that

the participants experiment delay and show a lower production in functional prepositions when compared to lexical prepositions. Nonetheless, studies like Stewart (2015) show that this need not be the case in Spanish.

The present study is innovative because it focuses on the very first stages of acquisition in 2L1 Spanish/English bilingual children, in an attempt to contribute to fill in the gap in the literature. None of the previous works specifically explores at the same time the age range and the language pair discussed here. In particular, this investigation is concerned with the early production of two English prepositions, *in* (as a lexical preposition) and *of* (as a functional preposition) in the spontaneous production of 2L1 Spanish/English bilingual children. Taking previous formal and empirical works as points of departure, this study aims to address the potential delay in the acquisition and the lower rates of production of functional as opposed to lexical prepositions in bilingual English when compared to monolingual English.

In order to do so, a formal account of prepositions is presented in section 2 with a view to offering a linguistic description of the two languages under analysis (i.e., English as the target language under investigation, and Spanish as the other L1 of the 2L1 bilingual children analyzed). Furthermore, section 2 includes a review of empirical studies that have discussed the acquisition of prepositions both in the case of L1 children and in the case of 2L1 bilingual children. Based on these previous investigations, two different research questions are presented in section 3: one pertaining to the emergence, thus, the first appearance of the prepositions under study, and the other one on both the overall production and the overtime production of these prepositions, in both the bilingual and the monolingual participants. Section 4 deal with the methodology that has been used to address the research questions and this includes the selection of the participants and

the data. An account of the data classification criteria appears in section 5. Section 6 comprises the analysis and the discussion of the data, followed by a conclusion and further research suggestions.

2. Literature Review

2.1. Formal Linguistic Description of Prepositions in English and in Spanish

Jackendoff (1973) provides base rules to acknowledge prepositions as a separate syntactic category, and not as mere case-markers or a subclass of verbs. He discards the former considerations, that stem from the idea that prepositions could only be followed by a DP, and argues that prepositions can precede other types of words, for instance, another preposition, as in (2).

(2) back from his successes (Jackendoff, 1973, p. 348)

Jackendoff's (1973) work is, therefore, one of the first to acknowledge the complexity of prepositions and to consider prepositions as a separate grammatical category. The ideas presented in Jackendoff (1973) are further developed in Quirk et al. (1985, p.657) who define prepositions as words that express a relationship between a part of the sentence and the complement of the preposition. Moreover, they specify, in line with Jackendoff, that this complement is not exclusively a DP but can be a *wh*-clause (3) or an *-ing* clause

(4), too.

(3) from what he said (Quirk et al., 1985, p. 657)

(4) by signing a peace treaty (Quirk et al., 1985, p. 657)

Furthermore, Biber et al. (1999, p.75) describe them as typically short and invariable words that introduce prepositional phrases, usually preceding a DP, and that in some cases have the same function as case inflections in other languages. Quirk et al.'s (1985) and Biber et al.'s (1999) definitions are very similar, and Huddleston and Pullum (2002) combine them and add further clarifications to refer to what makes the category unique. Huddleston and Pullum (2002, p.603) define them as a relatively closed group of words that mark both semantic roles and syntactic functions, and that take DP complements, but also adverbial phrases (5) or adjectival phrases (6), and *-ing* clauses and *wh*-clauses (see (3) and (4) above; as already pointed out by Quirk et al., 1985). They also add that most prepositions can be modified by *right* or *straight* (7).

(5) until recently (Huddleston and Pullum, 2002, p. 599)

(6) (they took me) for dead (Huddleston and Pullum, 2002, p. 599)

(7) right under the bed (Huddleston and Pullum, 2002, p. 606)

Most authors in the last decade still agree with the definition of prepositions that these authors have previously established, at least on the most basic issues. Hudson (2010, p.267) states that some prepositions connect nouns or verbs exclusively with other nouns (8) (e.g., *of*) and that other prepositions may precede nothing (9) (e.g., *before*).

(8) I thought <u>of</u> you (Hudson, 2010, p. 267)

(9) Betty had seen Mary <u>before</u> (Hudson, 2010, p. 267)

However, different opinions appear. Payne (2011), for instance, still maintains that prepositions precede only DPs and mostly indicate semantic roles. Fontaine (2013) summarizes their function as an indicator of relationships to a nominal group, indicating direction or situation.

In view of these different approaches and proposals, what is clear is that prepositions are not as easy to define as other central categories such as nouns, for instance. For the present study, Huddleston and Pullum's (2002) account will be used, because it appears to be more complete and accurate, as it captures the diverse nature of prepositions and their complexity both syntactically and semantically, as will be shown in the analysis.

In the case of Spanish, the Real Academia Española de la Lengua (RAE) in the *Nueva Gramática de la Lengua Española* (2009) offers a definition of prepositions that is, in fact, similar to those given by the previously mentioned authors in the case of English. They establish that prepositions are invariable words, characterized by

introducing a complement usually referred to as "term", following the Spanish grammar tradition. The preposition and the "term" would form a prepositional group (10).

(10) con [preposition] una pequeña ayuda [term] (RAE, 2009, p.2223)

with [preposition] a little help [term]

Nevertheless, the RAE (2009) acknowledges that in the last few years some authors have indicated that the "term" is not always obligatory (p. 2223). Given this definition, we find once again the view that prepositions are invariable words, most of the time followed by a complement forming a group (i.e., a phrase). This complement is usually a DP or a pronoun, as in the case of English. It seems safe to affirm, then, that in both languages this category of words appears to function similarly, their definitions being conformable.

However, even when there is enough agreement on the basic defining aspects of the class, there is one discrepancy present in the accounts provided in both English and Spanish formal grammar accounts: whether the word class that prepositions belong to is lexical or functional. Jackendoff (1973), for example, considers prepositions to be one of the four major lexical categories, along with verbs, nouns, and adjectives, having the defining features [-N, -V] (nominal, verbal). The main reason for considering prepositions so is that, he argues, prepositions can project a (prepositional) complement, much like nouns and verbs.

Contrary to this, Biber et al. (1999) and Payne (2011) label them as purely functional words. Other accounts are situated in between these previous two. For instance,

Huddleston and Pullum (2002, p.601) establish that rather than being completely lexical or functional, some uses have been grammaticized. This is so, for instance, when prepositions are considered exclusively as case assigners. In these uses, they would always precede a DP, and they cannot have a modifier.

Moreover, studies like Bordet and Jamet (2010) offer an analysis in which the distinction would be rather gradual, with some prepositions falling closer to the lexical side (e.g., *about*), and others to the functional side, (e.g., *of*, which is, according to them, the most grammaticalized preposition in English) (p. 13).

For Spanish prepositions, the RAE (2009) posits something in line with both Huddleston and Pullum (2002) and Bordet and Jamet (2010). They acknowledge that there is an ongoing discussion as to where to situate this word class, and that, therefore, it must be assumed that while some prepositions assimilate grammatical (functional) elements, others provide lexical information. Therefore, the distinction should be gradual. For instance, *de* in Spanish (equivalent to *of* in English) is a preposition that they consider to be functional.

To conclude, in both languages, English and Spanish, prepositions are argued to possibly be a hybrid category. If this were so, a relevant way to test it would be to analyze them from the point of view of language acquisition. Given that lexical categories have been proven to emerge earlier in the production of children, then lexical prepositions should theoretically appear earlier than functional prepositions. In the next section, previous empirical studies on the acquisition of prepositions are explored with a focus on this possible dichotomy the category exhibits.

2.2.Empirical Studies on the Acquisition of Prepositions by Monolinguals and Bilinguals.

To the best of our knowledge, there is no empirical study up to today dealing either with the language pair (Spanish/English) or with the age range (the first stages of acquisition, age 1 onward) that is of interest for the present investigation. This section, therefore, reviews different empirical studies that explore the production and acquisition of prepositions in Spanish and English monolinguals, and in bilinguals with other language pairs.

In the previous section, the potential hybrid nature of prepositions was discussed, which was one of the discrepancies among formal grammarians. This distinction between lexical and functional prepositions, if there is one, has important consequences for acquisition. This is so because previous empirical studies have shown that children usually acquire lexical categories earlier than functional categories, and so, for example, nouns would be acquired before determiners (de Villiers & de Villiers, 1973).

Littlefield (2005) argues that there is, in fact, a lexical/functional division in prepositions that is reflected through differences in the acquisition patterns. Her study analyzes spontaneous and longitudinal data from two English L1 children obtained from The Child Language Data Exchange System (CHILDES) database (MacWhinney, 2000).

Littlefield (2005) analyzes a list of sixty prepositions, including, among others, prepositions such as *of, for, from, in, out,* or *up.* In her study *of* is the only preposition considered functional, the rest of them being categorized as lexical. The reasons are that the preposition *of* is "semantically null", it does not assign a thematic role, only case, and, contrary to the rest of the prepositions, it assigns inherent case instead of oblique case

(p.4).

To process the data, Littlefield (2005) uses the CLAN (Computerized Language Analysis) program. She divides the data into different MLU (Mean Length of Utterance) groups[1]. Comparing across children's linguistic data using as a point of reference the MLU, instead of the age of the participants, ensures that the children's production is at the same level of linguistic development. She establishes seven different MLU groups: 1.0-1.49, 1.5-1.99, 2.0-2.49, 2.5-2.99, 3.0-3.49, 3.5-3.99 and 4.0 onwards. Moreover, she excludes from the analysis different utterances that include imitations, songs, repetitions of the same utterance, and idiomatic expressions.

Littlefield's (2005) results show that lexical prepositions appear earlier, in MLU 1.5-1.99 (group 2) for both children. Moreover, the children have afterwards a "steady, relatively rapid increase" in their use of lexical prepositions (p.7). Functional prepositions, however, do not appear until MLU 2.0-2.49 (group 3), and even then, their rates of occurrence are lower. For instance, in MLU group 3 both children are producing lexical prepositions at a rate of 10% or more, while functional prepositions account only for 1.5% of the cases.

Littlefield (2005) also analyzes errors of omission and substitution. She finds that the error rate, overall, is higher in functional prepositions than in lexical prepositions. In fact, according to her results, the two children that she analyzes have a mean error rate of 40% and 37% in the overall production of functional prepositions across the seven MLU groups, vs. a 11.9% and 12% in the production of lexical prepositions. She argues that

[1] The MLU was proposed by Brown (1973) in his pioneer work on the acquisition of grammatical morphemes as an indication of grammatical development. The MLU value indicates the average length of the sentences produced by the participants by measuring either morphemes (MLU) or words (MLUw).

these findings in the acquisition of prepositions point towards prepositions being a hybrid word class.

English is not the only language in which acquisition patterns point towards a lexical/functional divide in prepositions. A study by Klinge (1990) analyzes three German/French 2L1 bilingual children. She studies spontaneous and longitudinal data from the DUFDE (Deutsch und Französisch Doppelter Erstspracherwerb / German and French Simultaneous First Language Acquisition) project. Although the author does take into consideration the MLU values of the participants, there are no established groups, contrary to Littlefield (2005). Moreover, the author sometimes compares the data considering the age of the participants rather than their MLU, so the results are not exactly comparable to those in Littlefield's study.

Nevertheless, one of the issues the author explores is the production of functional prepositions. Klinge (1990) states that functional prepositions are usually not present until age 3;4 to 4;0[2]. Although we do not know to what MLU values this corresponds to, what we do know is that she explains that the production of functional prepositions starts later than almost every other lexical preposition analyzed in the study (p.141). This is so for both languages under analysis, French and German. Moreover, she mentions that not only do functional prepositions emerge later, but also their production is lower when compared to that of lexical prepositions. These acquisition patterns provide evidence of prepositions being indeed a hybrid category in French and in German, too.

Stewart (2015) explores the two languages of the participants analyzed in the present study (i.e., English and Spanish) and in the age range that is of interest to us (i.e.,

[2] As standard procedure in acquisition studies, age is indicated as follows: years; months. This is the way that age will be indicated in the present study.

first stages of acquisition). However, he does not deal with bilingual children, but with monolingual children of the two languages. He analyses the early production of Spanish prepositions in L1 Spanish children and of English prepositions in L1 English children.

Stewart (2015) uses spontaneous and longitudinal data from CHILDES, like Littlefield (2005), and considers the data in terms of MLU stages. He creates different MLU groups, going from MLU 1.5 to MLU 5.0, separating each group by 0.25. In his study, he also analyses the adult data from the corpora, in order to compare the children's production to the adult's production (i.e., the children's input and the so-called child directed speech, the adapted language in which adults address children).

Stewart (2015) calculates the relative frequency of production for each preposition in the children's data and compares it to the relative frequency of production in the adults' data. His results show that the production of prepositions traditionally considered lexical (in his study prepositions like *in* or *on*) is higher in L1 English children, when compared to their total production of prepositions, at low MLU levels, and when compared to the adults' production, too. This suggests that, already in early MLU stages, L1 English children produce overall more lexical prepositions (e.g., *in* or *on*) than functional prepositions (e.g., *of* or *for*). The children produce, in fact, even more lexical prepositions than the adults overall.

For L1 Spanish children, however, the results are different. Both the L1 Spanish children and the adults that interact with them behave similarly. From the moment that the L1 Spanish children start producing functional prepositions, their production remains stable, their growth is flat and parallel to their production of lexical prepositions. While in L1 English children "the expression of functional prepositions is relatively delayed until MLU is around 3". (p. 143). Therefore, for L1 English children, there is a constant

rate of production in the case of lexical prepositions from the start (in relative frequencies), but functional prepositions increase as the MLU increases, too. While, for L1 Spanish children, both lexical prepositions and functional prepositions have a similar "flat growth" across the different MLU stages (p.139).

The findings from Stewart's (2015) study suggest that in English the acquisition, or rather the production, of prepositions seems to be affected by the suggested lexical/functional divide. Nevertheless, in Spanish, both lexical and functional prepositions appear earlier, and their growth is relatively steady as the MLU grows, too, so in their case, the lexical/functional divide is not reflected in the acquisition patterns. There exists the possibility then that the lexical/functional divide is not universal but language-bound, at least as it is reflected in acquisition (i.e., determinant in English but not so in Spanish).

To sum up, these studies, especially Littlefield (2005) and Stewart (2015), point towards a difference in acquisition between the so-called lexical and functional prepositions, at least in English. However, it is interesting to point out that this division is apparently not reflected in L1 Spanish children's acquisition data. In the following sections, the research questions that take these findings as a point of departure and that have guided the present investigation are formulated.

3. Research Questions

The first research question is concerned with the stage in which the onset of lexical and functional prepositions occurs. In previous studies on the monolingual acquisition of English, functional prepositions emerge later than lexical prepositions (e.g., Littlefield,

2005), but this may not have been the case for L1 Spanish children (e.g., Stewart, 2015). For this reason, by choosing a traditionally defined as a lexical preposition (*in*) and a traditionally defined as a functional preposition (*of*), the order of emergence between the two prepositions will be addressed. Thus, research question number 1 is a two-part question, and the formulation is the following. **Research question #1**. Will the prepositions *in* and *of* emerge at the same MLU stage, and will this be the same for 2L1 Spanish/English children and for L1 English monolingual children?

Thus, the focus is two-fold: first, detecting whether there are any differences between the emergence of two prepositions within each of the participant groups (i.e., monolinguals and bilinguals), especially regarding the emergence of the lexical vs. the functional preposition; and second, comparing the stage in which each preposition appears in the Spanish/English bilinguals and in the English monolinguals.

The second research question deals with the production of the two English prepositions. In some previous studies, L1 English children produced more lexical prepositions than functional prepositions overall, even more than the adults, in the first stages of acquisition (Stewart, 2015). Moreover, the production of lexical prepositions in L1 English children grew rapidly, while the production of functional prepositions grew more slowly (Littlefield, 2005). However, studies like Stewart (2015) show that this was not necessarily the case for L1 Spanish children. In the light of these results, the second research question has, therefore, two different issues that will be explored. **Research question #2:** Will there be a difference between the production of lexical and functional prepositions in the 2L1 bilingual children when compared to L1 monolingual children in terms of both the overall production and the over-time production across the different MLU stages?

These questions aim at addressing the gap in the literature on the acquisition of prepositions and at providing further information as to how prepositions are acquired in the specific case of Spanish/English simultaneous bilingual children. The following sections offer an account of the process of selection of the participants and their corresponding data, necessary to address these two research questions.

4. Data Selection and Participants

The data selected for the present study are spontaneous and longitudinal, similar to those in the previous empirical studies (e.g., Littlefield, 2005; Klinge, 1990; see section 2.2. above). The corpora have been selected from the CHILDES database (MacWhinney, 2000). The participants under study are two 2L1 Spanish/English children and two L1 English children that are used as a control group.

For the bilingual data, the FerFuLice corpus was selected (Fernández Fuertes and Liceras, 2019). The FerFuLice corpus contains the oral recordings and the written transcriptions of the spontaneous production of a set of male twins, Leo and Simon, born and raised in Spain and who were recorded from 1;01 to 6;05. Their father is a native speaker of peninsular Spanish, and their mother is a native speaker of North American English. The twins' parents used the one parent-one language strategy of communication (Grammont, 1902); this means that each of the parents always used their L1 when they addressed the children.

For the monolingual children, and in order to avoid dialectal issues that could interfere with the results, North American English corpora were selected, since this was the dialect that the mother of the bilingual twins spoke. The two L1 English corpora are:

the Braunwald corpus (Braunwald, 1971), which contains recordings from a girl, Laura, aged 1;05 to 7;0; and the Sachs corpus (Sachs, 1983), which contains recordings from another girl, Naomi, aged 1;02 to 4;9 (see Table 1).

Table 1

Selection of Participants

Children	Age range (corpus)	Age range (study)	Language(s)	Corpus
Leo	1;01-6;05	1;01-3;06	Bilingual American English/Peninsular Spanish	FerFuLice
Simon	1;01-6;05	1;01-3;06	Bilingual American English/Peninsular Spanish	FerFuLice
Laura	1;05-7;0	1;05-4;10	Monolingual American English	Braunwald
Naomi	1;02-4;09	1;02-4;09	Monolingual American English	Sachs

For the purpose of comparing the longitudinal production of the two prepositions (*in* and *of*) across the data from the different children, both bilingual and monolingual, the data have been divided into different developmental stages. In this case, given the potential initial delay bilinguals as well as twins are said to experience (e.g., Dale et al., 1998), age might not be a reliable indicator of linguistic development. That is, if monolinguals and bilinguals are matched in terms of age, we might be comparing children that are at different linguistic developmental stages. Because of this, the stage division is done in terms of the MLU values of the children, judging it as the most reliable variable to compare across children.

Four developmental stages have been established: stage 1 comprises MLU values from 1.0 to 1.9, stage 2 from 2.0 to 2.9, stage 3 from 3.0 to 3.9, and stage 4 from 4.0 to

4.9. The MLU was calculated using the MLU CLAN program by running the syntax line //mlu +t*CHI @// (see Figure 1). "CHI" stands for "child" and //+t*CHI// indicates that the search is performed in the child's production only. In the FerFuLice corpus files, where two children appear in the recordings, this syntax line gave us the MLU of both Leo and Simon.

Figure 1.

The Clan Program Running the MLU Syntax Line

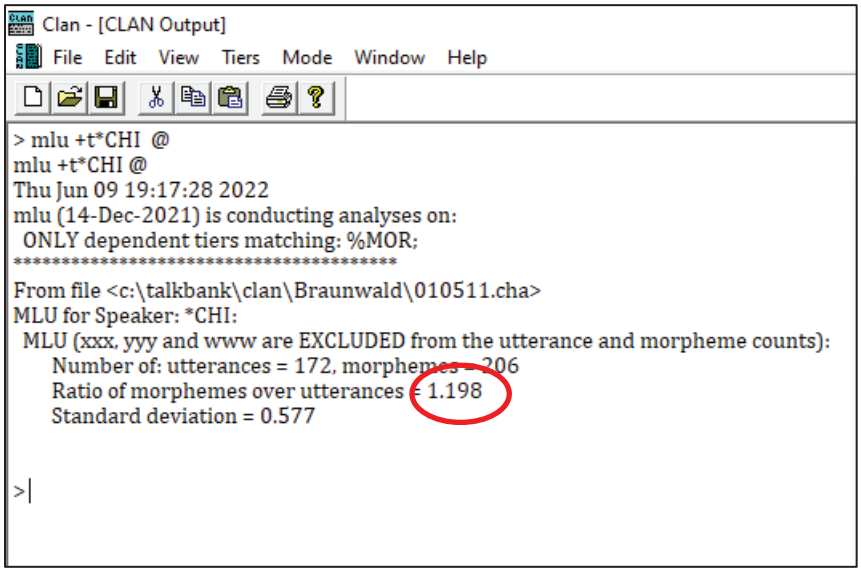


Figure 1 illustrates the output of the MLU program when using the syntax line described above. The MLU value that is output is the one that appears in "ratio of morphemes over utterances" (i.e., 1.198 in Figure 1 above, marked in red). The MLU was calculated for each of the different files that were available for all four participants in the age rage under investigation (see Table 1 above).

Then, these files were grouped considering their average MLU, harmonizing them

as much as possible across all the children and for each of the stages. The results for each of the files can be consulted in the Excel database in OneDrive (see Appendix 2). In the end, not all the files were used for the study. The process of establishing each stage was arduous, because MLU levels fluctuate a lot from one file to another at times, something not uncommon given that spontaneous data are being considered.

Generally, what was considered was that, for a certain number of consecutive files, the MLU was similar, or at least inside the range that each stage demanded. Whenever this was not possible, when the MLU varied greatly from one file to another, what was considered was whether the MLU values, after spiking or descending, went back to the values of the stage again or not. All this can be consulted in the first sheet of the Excel database, too, where the MLU of each file appears alongside its stage (Appendix 2).

Moreover, despite making the division in terms of MLU values, in order to select data that were matched as much as possible, the files of the monolingual and the bilingual children (respectively) were chosen to coincide in both MLU and age among themselves. This is what Table 2 shows. It is important to consider that the selection of the data is done using the data that are available. Thus, sometimes, as in the present case, no perfect matching is obtained both in terms of MLU and age.

Table 2

MLU Values and Age of the Participants across Stages

Stages	**1**		**2**		**3**		**4**	
	MLU	Age	MLU	Age	MLU	Age	MLU	Age
Bilinguals								
Leo	1.414	01;01 02;07	2.630	02;07 02;11	3.666	02;11 03;02	4.649	03;02 03;06
Simon	1.389	01;01 02;07	2.427	02;07 02;08	3.773	02;10 03;02	4.706	03;03 03;06
Monolinguals								
Laura	1.470	01;05 01;10	2.490	01;10 02;02	3.157	02;06 03;06	4.0	04;07 04;10
Naomi	1.594	01;02 01;10	2.483	01;10 02;02	3.338	02;03 03;03	4.154	03;03 04;09

What Table 2 shows is that there is an MLU match between the bilinguals and the monolinguals in that their MLU values in each of the four stages are rather similar (e.g., around 1.5 in stage 1). The corresponding ages, however, exhibit some differences, as was expected. And so, for instance, in stage 1 bilinguals are a few months older than monolinguals. In the case of the monolinguals, an important difference between the two children appears in stage 4, since Naomi reached an MLU of around 4.1 much earlier than Laura did. For this reason, Laura's stage 4 lasts only three months, but it lasts more than a year in Naomi's case. Individual differences like these ones are a constant in acquisition studies, and they are accentuated when spontaneous data are considered. So, given these premises, the matching in Table 2 is as perfect as the nature and the availability of the data allow.

One further important issue to consider is that the number of files for each one of the participants varied substantially, especially from monolinguals (i.e., 221) to bilinguals

(i.e., 108). Monolinguals produced longer utterances from much earlier, and each of their MLU stages lasted for a longer time. Both bilinguals stayed on stage 1 for a longer period, but afterwards they reached stage 4 earlier than their monolingual counterparts. For instance, Leo's and Simon's stages 2 and 3 had very few files, since they seemed to have gone over these stages faster than bilinguals (stage 2 lasted two months for Leo and one month for Simon), while for Naomi and Laura these stages lasted almost a year (see Table 3).

Table 3.

Number of Files Analyzed for each Child in each of the Stages

Stages	**1**	**2**	**3**	**4**	**TOTAL (per child)**
Leo	25	9	5	16	55
Simon	25	6	11	11	53
Laura	43	46	34	5	128
Naomi	13	38	31	11	93
TOTAL (per stage)	106	99	81	43	

Table 3 shows that there exist differences in the number of files both between participants and between stages. In general, stage 4 is the one that comprises less files for all the children. For bilingual children, the reason is that they quickly moved onto an MLU of 5.0 onwards, so the number of files with a mean MLU of 4.0 to 4.9 was limited. And, in the case of the monolingual children, it is simply due to the availability of the data, since there were more files available from their earlier production. Moreover, another important issue that marks a difference in the number of files is that, since the recordings from Simon and Leo are divided between English and Spanish, and those of

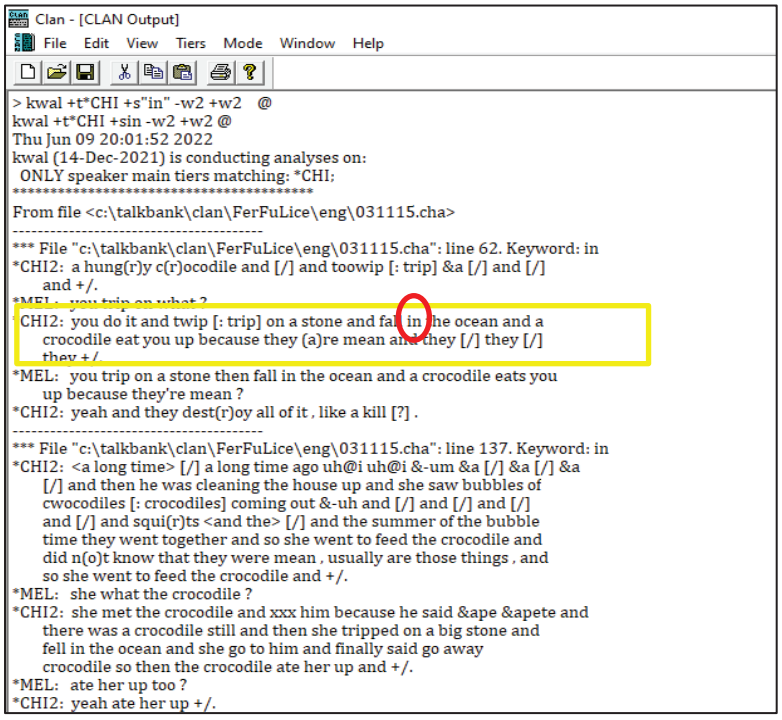
the monolinguals are exclusively in English, there are fewer files for the bilingual twins, considering that for the present study only the English recordings have been used. This situation always arises when comparing monolingual and bilingual production since, when the target language is one, the entire production of the monolingual is being analyzed, but only half of the production of the bilingual is being considered (i.e., that in one of their two L1s, English, in this case).

5. Data Classification Criteria

After establishing the stage division using MLU correspondences, the CLAN program was used to find the prepositions *in* and *of* in the children's production. The command KWAL (Key Word and Line) was used to search not only for the instance in which the prepositions appeared, but also for the context in which they appeared. In particular, the following syntax lines were used: //kwal +t*CHI +s"of" -w2 +w2 @// and //kwal +t*CHI +s"in" -w2 +w2 @// (see Figure 2).

Figure 2.

The Clan Program running the KWAL Syntax Line



The section of the KWAL output in Figure 2 shows two different utterances containing *in* in a particular file. In this case, the utterance we are interested in is the one that appears in the middle (in yellow the whole utterance, in red the preposition), since we asked for two lines prior to the target line where the preposition is (-w2) and two lines after the target line (+w2).

Even if KWAL facilitated the automatic extraction of the data, because it was not necessary to go over the entirety of the files, all utterances in the KWAL output had to be checked one by one to remove those that did not fit the inclusion criteria. For an instance of the two target prepositions to be included as part of the corpus of analysis, the following criteria need to be met: a full prepositional phrase needed to be produced (i.e., preposition + complement), and the prepositional phrase needed to be part of the child's productive

language. Utterances like those in (11) and (12) constituted the corpus of analysis, that is, they were counted and classified into each of the stages.

(11) my baby took a drink **of** Fresca (Laura, 3;06)

(12) put onions **in** his tummy (Leo, 3;01)

Several instances were excluded from the present study: repetitions, fixed expressions, incomplete utterances, and song lyrics. In the case of repetitions, when the child is repeating the exact same sentence multiple times, only the first occurrence was counted. Moreover, when the child is repeating word by word what another person has just said, the child's production was not considered as it is not part of the child's spontaneous speech. Expressions like "in love" in which the preposition was part of a fixed construction were not considered either. Incomplete utterances in which only the preposition appear but not its corresponding complement were excluded as well (e.g., "CHI: in" followed by nothing else in the child's present speech turn). Prepositions that appear in song lyrics were excluded from the analysis as they do not constitute an instance of productive language. In the case of the bilingual twins, utterances labeled as "SOL" were also excluded since the use of SOL indicates that it is not clear whether Simon or Leo produced the utterance.

Each utterance containing *in* or *of* in the contexts that were of interest for the study was added to the Excel database. Each item was numbered and later classified in terms of the child that uttered it, and the stage in which it had been uttered. All this can be consulted in the database (Appendix 2).

In the following section, the results obtained after this process of classification of

the data along with the data analysis are presented.

6. Data Analysis and Discussion

6.1. Research Question #1: the Emergence of the Prepositions In *and* Of

Previous studies established that functional prepositions like *of* emerged later than lexical ones like *in* in English (e.g., Littlefield, 2005). The same seemed to be true in languages like German or French (e.g., Klinge, 2010) but not apparently so in languages like Spanish (e.g., Stewart, 2015). The first research question aimed to determine whether the spontaneous production of 2L1 Spanish/English children would reflect such a difference, thus, whether functional prepositions would be produced earlier in bilingual English.

First, the interest was to observe if these prepositions would appear in similar stages in both bilingual children, and, moreover, if the lexical preposition would precede the functional one or not. Represented in Figure 3 are the exact MLU values of bilingual children when they produced the first utterance (onset) containing the lexical (*in*) and the functional (*of)* prepositions.

Figure 3.

The Onset of In *and* Of *in the Bilingual Participants*

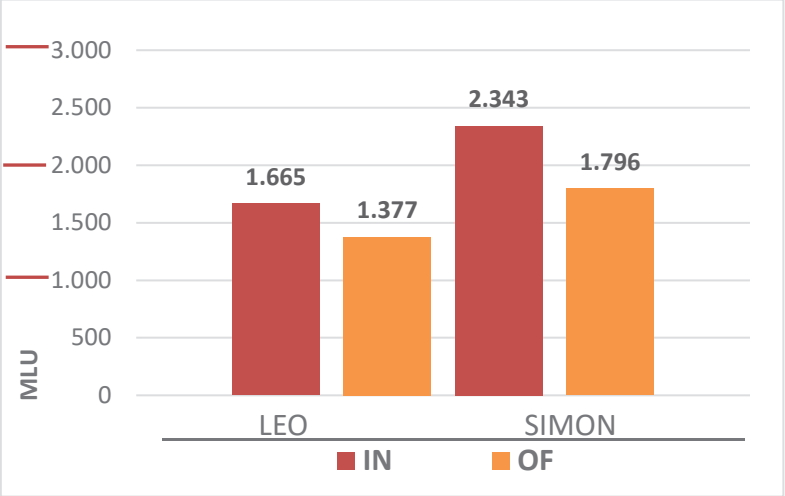


Figure 3 shows that the bilingual children produced the lexical preposition (in red) in different MLU stages, stage 1 in the case of Leo and stage 2 in the case of Simon. It can be observed, too, that both children produced the functional preposition (in orange) in the same stage (stage 1). However, regardless of the difference in the stage in which the two children produced the lexical preposition, for both bilingual children the onset of the lexical preposition (*in*) came later than the onset of the functional preposition (*of*) (MLU of 1.6 vs. 1.3 for Leo and MLU of 2.3 vs. 1.7 for Simon). This would coincide with the L1 Spanish participants of Stewart's (2015) study, since they did not show delay in the production of the functional preposition and so both the lexical and the functional prepositions appear virtually around the same MLU stage (1 or 2).

For the monolingual participants, the interest was to see whether, just like in previous studies, the lexical preposition (*in*) would appear earlier in the production than the functional preposition (*of*). Represented in Figure 4 are the exact MLU values of the monolingual children when they first produced both prepositions.

Figure 4.

The Onset of In *and* Of *in the Monolingual Participants*

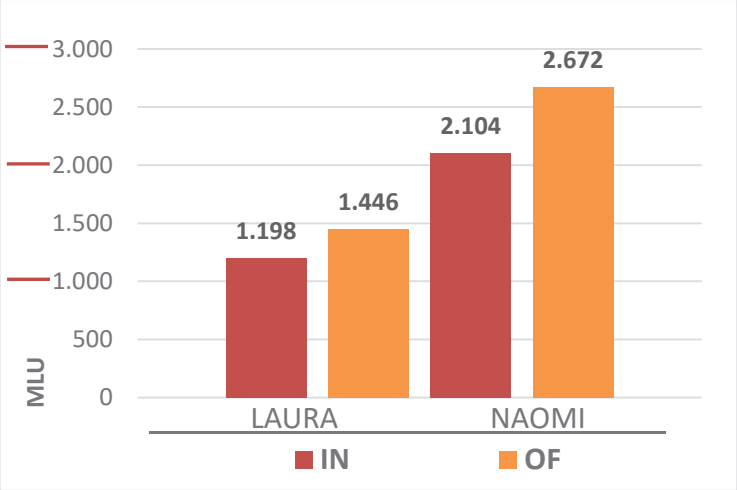


Figure 4 reveals that, in the case of the monolingual children, both children produced the lexical preposition (*in*) at a similar MLU stage (i.e., stage 1), and they both produced the functional preposition (*of*) in stage 2. Therefore, both English monolinguals produced earlier the lexical preposition than the functional preposition. This goes in line with the results of the L1 English participants in Littlefield's (2005) and Stewart's (2015) studies.

The second part of this first research question deals with the comparison between the target and the control group (i.e., the bilinguals and the monolinguals) to determine whether the stages of emergence of the prepositions would be similar in both groups. This is what Figure 5 and Figure 6 show.

Figure 5.

The Onset of In

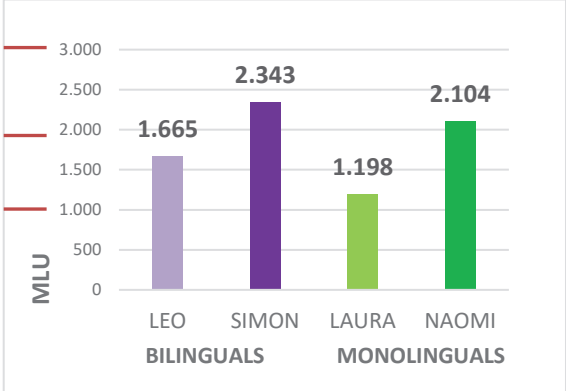
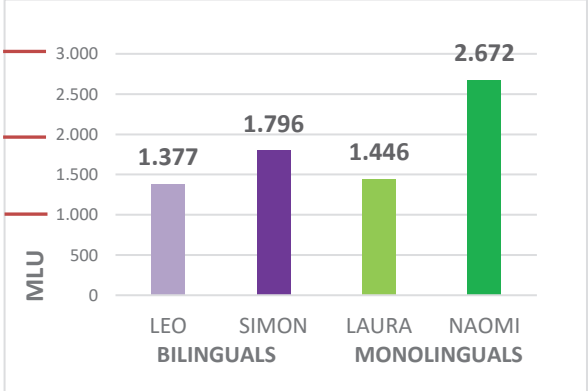


Figure 6.

The Onset of Of



These two previous figures illustrate that all the participants of the present study produced both prepositions, lexical and functional, within the first two stages. Nevertheless, as it has already been established, even when the stages coincide, both bilinguals produced earlier the functional preposition *of,* while both monolinguals produced earlier the lexical preposition *in*.

It is interesting how both 2L1 Spanish/English bilingual children produced earlier the functional preposition, because this could point towards a possible effect of crosslinguistic influence from Spanish into English for this particular syntactic property. In this case, since the Spanish/English bilingual children are producing the functional preposition earlier than the English monolingual children, it would suggest that there exists a process of acceleration (Paradis and Genesee, 1996).

6.2. Research Question #2: Overall and Over-time Production of the Prepositions In *and* Of

Research question number two focused on whether there will be differences in the overall (total) and over-time (across MLU stages) production of the bilingual and the monolingual children for these lexical and functional prepositions. To answer the first part of the question (i.e., overall production), the total number of prepositions that the children produced during the entire study period was considered (see Table 4).

Table 4

Total Production of in *and* of *during the Study Period*

	In	**Of**
Bilinguals		
Leo	55.7% (93/167)	44.3% (74/167)
Simon	63.3% (71/112)	36.6% (41/112)
Total # bilinguals	**58.7%** (164/279)	**41.2%** (115/279)
Monolinguals		
Laura	74.7% (272/364)	25.2% (92/364)
Naomi	80.1% (257/321)	19.9% (64/321)
Total # monolinguals	**77.3%** (529/685)	**22.7%** (156/685)
Total # of occurrences	**71.9%** (693/964)	**28.1%** (271/964)

The results in absolute values were inevitably different due to the difference in the

amount of data (i.e., number of files) for each stage and each child (see Table 3 above). Because of this, and in order to compare across children, the percentages of both the production of lexical prepositions (*in*) and of functional prepositions (*of*) were calculated, as shown in Table 4.

Previous studies like those of Littlefield (2005) or Stewart (2015) have shown that L1 English children produced, overall, more lexical than functional prepositions in these stages. The results of the present investigation reveal that the overall production of the bilingual and the monolingual children contained more utterances of the lexical preposition (*in*) than of the functional preposition (*of*) in these initial stages of acquisition. This is consistent with previous studies on children acquisition like de Villiers and de Villers (1973) that showed that lexical elements emerged earlier and were more frequent at the beginning than functional elements, and studies like Littlefield (2005) or Stewart (2015), in which L1 English children produced more lexical than functional prepositions in these early stages.

However, if we focus exclusively in the overall production of the bilingual children, and we compare it to the overall production of the monolingual children, the results show that, even when the lexical preposition *in* is produced more than the functional preposition *of* (i.e., 58.7% vs. 41.2% respectively), their difference in overall production is more softened than what we find in the monolinguals (i.e., 77.3% for *in* vs. 22.7% for *of*). Once again, this could point towards the effect of crosslinguistic influence from Spanish into English, that could be triggering an acceleration on the acquisition of this syntactic property.

The second part of this research question addresses the potential difference in production across the four developmental stages when comparing the bilingual children

to the monolingual children. The results in Stewart (2015) show, first, that the L1 Spanish children behave more adult-like from the beginning, and that the production of lexical with respect to functional prepositions is not very different, both growing consistently across the different stages. And, second, they also show that the L1 English children produce lower rates of functional prepositions when compared to lexical prepositions, especially until the MLU of 3.0. If, as pointed out by our results so far, Spanish is triggering a process of acceleration in the acquisition of functional prepositions in the 2L1 Spanish/English children, the results across MLU stages for the bilingual children should differ from those of the monolinguals.

Percentages were calculated by taking the total number of utterances produced in each stage for each of the children, with respect to the total number of utterances each child produced across the four stages. It must be noted that for all the children the production of prepositions in stage 1 (MLU 1.0 to 1.) was very low, which was expected since longer utterances are needed to produce them. The results can be seen in Figure 7 and Figure 8.

Figure 7.

The Production of In *and* Of *in Bilinguals across MLU Stages*

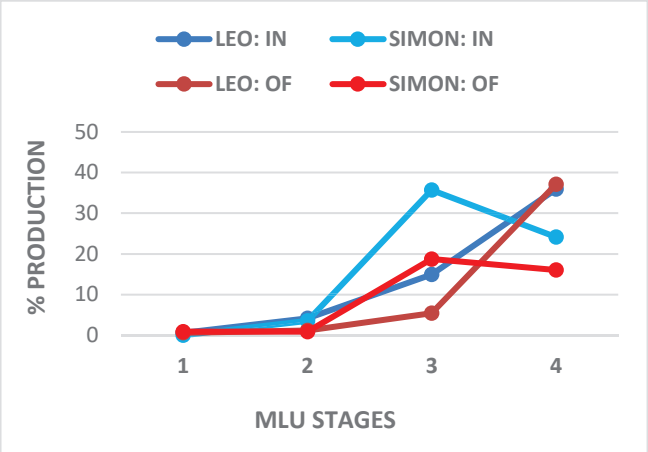
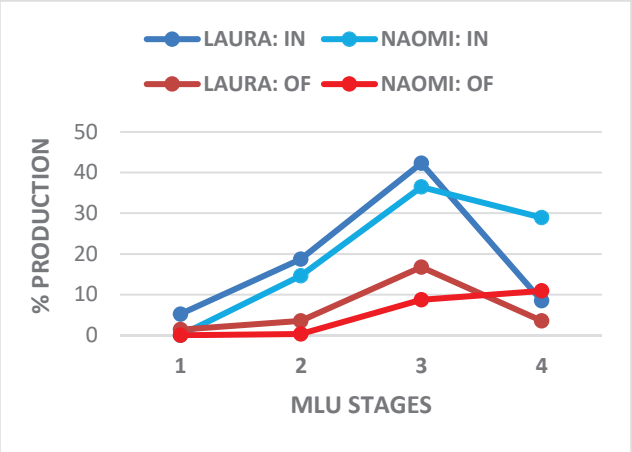


Figure 8.

The Production of In *and* Of *in Monolinguals across MLU Stages*



What the results of the present investigation show is that, for the 2L1 Spanish/English children, the production of both the lexical and the functional prepositions appears to grow parallel across MLU stages 2 to 4, as can be seen in Figure 7. In the case of Leo in particular, the production of both prepositions grows over-time, reaching its peak in stage 4. In the case of Simon, in stage 4 the production of both prepositions drops. But, for both children, the production of both *in* and *of* grows parallel, and, although *in* is produced more than *of*, the difference is not very broad.

As for the monolinguals, the results show more pronounced differences in the production patterns of the lexical and the functional preposition across the four MLU stages (see Figure 8). Although the production of both prepositions grows over-time in both monolingual participants, the lexical preposition (*in*) is much more frequent (especially in stages 2 to 4) than the functional preposition (*of*). Moreover, *of* never reaches the level of production that *in* does, and it only starts growing in stage 3 (which

is consistent with Stewart's (2015) findings). In the case of Laura, the production of *in* descends drastically in the last stage, but even then, it still does not reach the lower level of *of*. For Naomi, the division between the production of *in* and the production of *of* is very pronounced in stages 2 to 4.

These findings point, once again, towards the effect of crosslinguistic influence from Spanish into English as a potential explanation of the difference between the English bilingual production and the English monolingual production. The production from the monolinguals is in line with that of the monolinguals from previous studies. And, although the production of the bilinguals is not exactly similar to that of the L1 Spanish children in Stewart's (2015) study, it is definitely not similar to that of the L1 English or that of the L1 English children from studies like Littlefield (2005) or Stewart (2015). This difference points to acceleration on the acquisition of functional prepositions, by means of an influence from Spanish, the other L1 of the bilingual participants, that could help them to reach earlier an adult-like production in English.

7. Conclusion

This investigation is concerned with the way English prepositions *in* and *of* are acquired by 2L1 Spanish/English bilingual children when compared to L1 English children. The interest of this comparison lies in the different nature that has been attributed to these specific prepositions, both in formal studies as well as in previous acquisition works: *in* as a lexical preposition and *of* as a functional preposition. This is in line with acquisition works suggesting that lexical categories appear earlier than functional ones in the spontaneous production of both monolingual and bilingual children.

In order to address the lexical/functional division of prepositions, both formal linguistic proposals as well as acquisition studies have been considered. In this respect, the formal theoretical account of lexical and functional prepositions (e.g., Huddleston and Pullum, 2002) has been correlated with acquisition data, at least in the case of English, where the patterns of acquisition varied greatly from functional to lexical prepositions (e.g., Littlefield, 2005). However, in L1 Spanish children, this difference in acquisition patterns did not occur or was not as evident (Stewart, 2015).

While previous empirical studies have explored the hybridity of prepositions in different languages, and language pairs, the case of 2L1 Spanish/English simultaneous bilingual children remained unexplored. For this reason, the aim of this investigation was set on determining whether there were differences in the acquisition of English lexical and functional prepositions in 2L1 Spanish/English simultaneous bilingual children when compared to L1 English children, in the very initial stages of acquisition.

The results of the present study show that the lexical/functional division in prepositions in terms of acquisition is not as pronounced in 2L1 Spanish/English bilinguals as it is so in L1 English. The functional preposition (*of*) appears earlier in the bilinguals' production and keeps growing parallel to the lexical one (*in*) over-time.

Considering previous studies like Stewart's (2015) that showed that L1 Spanish produced functional prepositions early and their production was stable, a plausible interpretation of the bilingual children's performance could be crosslinguistic influence from Spanish into English in the case of the 2L1 Spanish/English bilinguals. That is, the onset of the English functional preposition, whose production is typically delayed in English monolinguals, appears earlier in the production of bilinguals because in their other L1 (i.e., Spanish) this preposition appears virtually at the same time as the lexical

preposition. If this were the case, this would be an instance of crosslinguistic influence with an acceleration effect (Paradis and Genesee, 1996) in that bilinguals reach adult-like grammar earlier than monolinguals for this particular area of grammar.

This idea is further supported by the overall production of functional prepositions in the L1 English children. In these early stages, the production of functional prepositions was less than that of lexical prepositions, which coincides with the results in Littlefield's (2005) study in L1 English. However, in the bilingual children this difference in the overall production was not as marked. That is, for bilingual children both prepositions appeared to be treated equally, given their simultaneous emergence and incidence along the study period. Therefore, the results from the present investigation suggest that there could exist crosslinguistic differences when it comes to the acquisition of lexical and functional prepositions.

Nevertheless, this potential crosslinguistic influence effect requires further investigation. For instance, the production of prepositions in the other L1 of the bilinguals (i.e., Spanish) could be analyzed, alongside that of L1 monolingual Spanish children. This will determine not only whether in that case the patterns of acquisition are similar for both groups of children, but also whether differences appear across the two L1s of the bilinguals. Moreover, the data from the adults that interact with the children (i.e., the so-called child input or child-directed speech) could also be analyzed along these terms in order to determine whether adult input has an effect on child output. This would offer an account of how input and crosslinguistic influence interact in the case of simultaneous bilingual acquisition for the specific area of prepositions. Finally, the analysis could take into consideration errors in the children's production, both omission errors and commission errors (i.e., substitutions), as this could also help complete the picture of how

prepositions are acquired.

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Appendix 1: List of Acronyms and Abbreviations

2L1 = Simultaneous Bilingual

CHILDES = Child Language Data Exchange System

CLAN = Computerized Language Analysis

DP = Determiner Phrase

DUFDE = Deutsch und Französisch Doppelter Erstspracherwerb / German and French Simultaneous First Language Acquisition

KWAL = Key Word and Line

L1 = First Language

MLU = Mean Length of Utterance (in morphemes)

MLUw = Mean Length of Utterance (in words)

N = Noun

RAE = Real Academia Española de la Lengua

SOL = Simon or Leo

V = Verb

Appendix 2: Database

TFM database.xlsx