PRODUCTION AND COMPREHENSION OF VERB AGREEMENT MORPHOLOGY IN SPANISH AND ENGLISH CHILD L2 LEARNERS: EVIDENCE FOR THE EFFECTS OF MORPHOLOGICAL STRUCTURE

BY

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DISSERTATION

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**ABSTRACT**

Verbal inflections are problematic for both first language (L1) and second language (L2) learners in both comprehension and production and take a while to develop. Most research has mainly looked at this phenomenon from the perspective of functional features and has tried to ascertain whether or not learners have the grammatical knowledge or representation of the L2. However, although insightful, research has failed to look in greater detail at how the structure of the target-language may affect learners’ production and comprehension of verbal morphemes. In L1 acquisition, it has been found that the structure of the language may have an effect on children’s verbal morphology acquisition. However, it is basically unknown whether this is also true for L2 acquisition or, if in contrast, all child L2 learners show similar patterns of verbal morphology acquisition regardless of the L2. The present study addresses this issue and investigates whether child L2 learners learning typologically distinct languages show similar acquisition of verbal morphology.

In order to address the study’s objectives, the acquisition of agreement morphology in school-age children learning Spanish and learning English as L2 was evaluated. Thirty two English-speaking children with ages ranging from 7;5 to 10;11 years (M = 8;9), were tested in the United States. All of these children were enrolled in an immersion program and had started learning Spanish when they were between 4 and 7 years old (M= 4.9). Additionally, 32 Spanish-speaking children, with ages ranging from 7;7 to 9;9 years (M= 9;0), were tested in Puerto Rico. All of these children were enrolled in an immersion program and had started learning English when they were between 4 and 5 years old (M=4.3).
The results revealed that the children learning Spanish showed high accuracy in producing Spanish 3rd person plurals and performed native-like in comprehending verbal agreement. In contrast, the children learning English exhibited low accuracy in both the production and comprehension of verbal agreement (3rd person singular -s), and did not reach native-like performance in any of the tasks.

These results suggest that there may be some parallelism between verbal morphology acquisition in L1 children and verbal morphology acquisition in child L2 learners. In both, the morphological structure of the language seems to play a role in the process of acquisition. The findings reported here for child L2 learners suggest that highly and regular inflected systems (e.g. Spanish) will be acquired at a faster rate than poorly and inconsistent inflected languages (e.g. English).
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CHAPTER 1

INTRODUCTION

1.1 Overview and Significance

The focus of this study is the second language (L2) acquisition of morphosyntax by school-age children, which has been a largely unexplored area in comparison to all the research carried out with adults learning a second language. For a while, research on second language acquisition considered child language learners to be a homogeneous group (Dulay & Burt 1974). The process of second language acquisition was, at that time, considered to be similar for all children regardless of the age at which the child was initially exposed to the non-native language. It was not until recently that researchers have acknowledged that there are differences among children depending on their age at initial exposure and context of acquisition (Golberg, Paradis & Crago 2008; Jia & Fuse 2007; Meisel 2007). As a result, child bilingual acquisition has been divided into two main categories: simultaneous bilingualism and sequential bilingualism. Simultaneous bilingualism is the term used to describe a situation in which a child is exposed to two languages from birth or soon afterwards. This is also referred to as bilingual first language acquisition. On the other hand, sequential or successive bilingualism (i.e. child L2 acquisition) is used to denote the case of a child whose initial exposure to the L2 takes place after his or her first language (L1) is developed to some extent, at about 4 years of age. The latter population is the focus of the present study.

The goal of the present study is to investigate subject-verb agreement acquisition in child L2 learners of English and Spanish. Verbal inflections are problematic for both L1 and L2 learners in both comprehension and production and take a while to develop. Several studies have suggested that
learners’ difficulties with verbal morphology are due to grammatical impairment at the level of grammatical knowledge or representation (see Wexler 1994 and Rizzi 1993/994 for L1 acquisition and Eubank 1993/1994, Eubank & Grace 1996; Hawkins & Chan 1997; Meisel 1997; Vainikka & Young-Scholten 1994 for L2 acquisition). Some others have proposed that they are due to processing problems (see Phillips 1995/2010 for L1 acquisition and Geçkin & Haznedar 2008; Haznedar & Schwartz 1997; Haznedar 2001; Herschensohn, Stevenson, & Waltmunson 2005; Paradis, Rice, Crago & Marquis 2008, Philips 2010 for L2 acquisition), while others have related learners’ problems with morphology to phonological problems in L2 acquisition (Goad, White & Steele 2003; Goad & White 2006).

The main question posed by the present study is whether child L2 learners learning typologically distinct languages show similar acquisition of verbal morphology. Most studies on the acquisition of verbal morphology have been focused on child L2 learners of English. Studies on child L2 learners learning other languages are limited. For instance, to the best of my knowledge, there are only two studies that have looked at verbal morphology acquisition in children learning Spanish as L2 (Herschensohn et al. 2005; Lichtman 2013). Thus, by doing a comparative investigation of English and Spanish, my goal with this study is to offer a broader view of the process of verbal morphology acquisition by child L2 learners, as well as contribute to ongoing theoretical debates as to the nature of the comprehension and production of verbal morphology in this population.

1.2 Child L2 Acquisition: Definition

Although researchers acknowledge that there are differences among young bilingual learners, it is still not certain where to draw the line and there is no consensus with regards to the
exact point at which language acquisition stops being simultaneous and starts being sequential. This remains a gray area and the boundary between the two types of acquisition may depend on how the researcher defines it. For instance, De Houwer (1995) argues that simultaneous bilingualism includes those children who are regularly exposed to the language from birth or soon afterward (e.g. within the first two months of age). McLaughlin (1978), proposed the less stringent cut-off point of exposure to two languages before the age of 3; whereas Genesee & Nicoladis (2007) proposed an even later cut-off point of exposure from birth to about the age of 4.

However, not only is the age at which sequential acquisition starts debatable, but also the age assumed to demarcate child and adult L2 acquisition. As a consequence, different age boundaries have been adapted in the pertinent literature. According to Penfield and Roberts (1959), brain plasticity is greater in children than in adults. They proposed that child L2 learners are those exposed to the target language sometime after birth but before the age of 9, because it is at this point that they assume the brain starts losing its plasticity and progressively becomes much more rigid. Along similar lines as Penfield and Robert, Lennenberg (1967) suggests that child L2 acquisition happens sometime after birth but before puberty, a time by which the lateralization of the language function is assumed to be complete. In a later study, Johnson and Newport (1989) in their famous study on the age effects in second language acquisition, included adults whose first exposure to the L2 occurred between the ages of 3 and 7 as a distinct group of second language learners.

A basic criterion that distinguishes child L1 acquisition and child L2 acquisition is that child L2 learners already know a language when exposed to the L2 and they may show L1
transfer. Moreover, L2 children, due to their age, may be cognitively more mature than L1 children. Child L2 development is also different from adult L2 development. Child L2 learners are said to use some of the cognitive and linguistic learning mechanisms used by children acquiring their L1 and are more likely to eventually reach native-speaker levels than adult L2 learners (Schwartz 2003). Following these criteria, recent studies have assumed an onset age around the ages of 3 to 4, because it is typically assumed that most of the child’s L1 is in place by this age (Schwartz 2003; Unsworth, 2008; Unsworth 2005, Meisel, 2008). As for the age that demarcates child L2 acquisition and adult L2 acquisition, 8 years old seems to be the time when children start to show a decline in their ability to reach native-like levels of performance (Dekeyser 2000, Johnson & Newport 1989), a phenomenon that characterizes adult second language acquisition. However, boundaries are not yet clear-cut and the age range that includes child L2 learners is still largely a matter of speculation. Many studies have adopted the following definition of a child L2 learner: a child whose initial exposure to the second language occurs between the ages of 4 and 8 years old (Blom E. 2008; Blom, E., Polišenská, D. & Weerman, F. 2006; Blom, E. Polišenská, D. 2005; Schwartz 2003; Unsworth 2005; Unsworth & Blom 2010). The present study adopts this definition and assumes that a child L2 learner is a child whose exposure to the L2 takes place between the ages of 4 to 8 years old.

1.3 Child L1, Child L2, and Adult L2 Acquisition

Typically developing children successfully acquire their L1 and achieve adult-like mastery of the language with relatively ease. In order to learn the language, children do not need instruction. They acquire the language naturally from the input they receive from their parents and the community where the child is raised. Native speakers are also able to develop clear
intuitions about what is possible (or not possible) in their language. By contrast, although there may be exceptions, adult L2 learners normally learn the target language through explicit teaching/learning in the classroom. Moreover, in adult L2 learners, successful acquisition of the language is not guaranteed. Instead, non-target like forms and divergence from the native norm may persist in their production even after a long period of exposure (a phenomenon called fossilization). Adult L2 learners also often lack clear intuitions about what is grammatical (or ungrammatical) in the language.

Meanwhile, child L2 acquisition may be placed between what counts as L1 acquisition and what counts as adult L2 acquisition. Child L2 acquisition may be considered to be the bridge between L1 and adult L2 acquisition; and it may resemble child L1 acquisition in some domains while resembling adult L2 acquisition more closely in others (Schwartz 2003). As such, the data provided by these learners can offer valuable insight and solve theoretical claims with respect to the effects of age, transfer of the L1, and access to Universal Grammar (UG) in both L1 and L2 acquisition. However, studies on this group of learners are still limited and little is known about the process of acquisition experienced by child L2 learners. More research with these types of learners is necessary in order to understand second language acquisition and, in particular, to better understand child L2 acquisition. My dissertation attempts to fill this gap by studying verbal inflection production and comprehension in child L2 learners.

As stated above, verbal inflections are found to be problematic for both L1 and L2 learners. Several approaches have tried to explain learners’ difficulties with verbal morphemes, but so far there is not agreement about what is or are the source(s) of learners’ difficulties. Most research has mainly looked at this phenomenon from the perspective of functional feature and
has tried to ascertain whether or not learners have access to them. However, although insightful, research has failed to look in greater detail at how the structure of the target-language may affect learners’ production and comprehension of verbal morphemes. In other words, traditionally, research has tried to establish how the presence or absence of functional features affect learners’ performance in the L2, but it has not directly studied how the structure of the target language may interact with learners’ performance in the L2. As will be described in the following section, in L1 acquisition, it has been found that the structure of the language may have an effect on children’s verbal morphology acquisition. However, it is not known whether this is also true for L2 acquisition or, if in contrast, all child L2 learners show similar patterns of verbal morphology acquisition regardless of the L2. In what follows, the main approaches to verbal morphology in L1 and L2 acquisition will be described. Although the main focus of this dissertation is child L2 acquisition, because child L2 learners have been found to resemble L1 and adult L2 acquisition, including a description of the approaches drawn in L1 and L2 acquisition was thought to be necessary.

1.4 Verbal Morphology in L1 Acquisition

In L1 acquisition, there is a stage in which the child fails to produce verbal inflections and instead produces non-inflected forms in contexts where an inflected form is required. See examples in (1).

(1)  
   a. **Spanish** (Bel 2003)
       Bibi [muñeco] dormir
       toy sleep-INF
b. **English** (Hoekstra and Hyams 1998)

Eve sit(Ø) floor

However, not all children go through this stage in the same way and there are differences between children learning structurally distinct languages (Davidson & Goldrick 2003; Montrul 2004). Children who are learning highly inflected languages, such as Spanish, show low rates of root infinitive forms. By contrast, children who are learning poorly inflected languages, such as English, show high rates of root infinitive forms. For example, compare the percentages of root infinitives reported for the languages in Table 1.1. The languages in the left column (i.e. highly inflected languages) have very low percentages of root infinitive forms while the ones in the right column (i.e. poorly inflected languages) have high percentages.

Table 1.1

*Percentage of Root Infinitives (RIs) in highly and non-highly inflected languages* (Adapted from Perales, Liceras & Bel 2006)

<table>
<thead>
<tr>
<th>Highly inflected</th>
<th>Child</th>
<th>%</th>
<th>Non-highly inflected</th>
<th>Child</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Italian</td>
<td>Paola</td>
<td>7</td>
<td>French</td>
<td>Natalie</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>Daniel</td>
<td>8</td>
<td>Swedish</td>
<td>Freja</td>
<td>38</td>
</tr>
<tr>
<td>Spanish</td>
<td>María</td>
<td>8</td>
<td>Dutch</td>
<td>Laura</td>
<td>36</td>
</tr>
<tr>
<td>Basque</td>
<td>Mikel</td>
<td>13</td>
<td>Tor</td>
<td>Tobias</td>
<td>36</td>
</tr>
<tr>
<td>Catalan</td>
<td>Julia</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The stage when children use both finite and non-finite forms (i.e. root infinitives) in finite contexts is commonly known as the *Root Infinitive Stage* (or the Optional Infinitive Stage) and it has raised several questions in the field of L1 acquisition. Researchers who have tried to explain
this phenomenon have studied whether and how the child’s grammar is different from that of the adult. Do children use finite and non-finite verb forms in the same places as adults? Or do they use these two forms randomly with no apparent syntactic differences between them? In this regard, evidence from children’s oral production seems to suggest that the child treats finite and root infinitive forms differently. Root infinitives and finite forms appear to be structurally distinct in the child’s grammar (e.g. finite verbs do not appear in non-finite contexts). Although children who are in the root infinitive stage tend to produce non-finite forms in finite contexts, when they do supply a finite form, most of the time they supply a form correctly inflected for agreement and tense (Phillips 1995/2010). In other words, agreement or tense errors are rare in the child’s data. Researchers have attempted to provide a satisfactory explanation as to why children go through this stage. They have also tried to explain the underlying differences (if any) between the child and the adult grammars.

Traditionally two approaches have been used to explain children’s performance. On one hand, there is the view that assumes that tense (T) feature is deficient in a child’s early grammar and, as a consequence, children are not sensitive to tense values (Wexler 1994, 1998); while on the other, there are those who maintain that the declarative structure is truncated and categories such as agreement (Agr) and T are not projected in the child’s grammar (Rizzi 1993/1994). Both views maintain that a child’s grammar diverges from that of an adult in that, in the former, main clauses with non-finite forms are allowed, while in the latter they are not. To support the argument that the child’s grammar allows non-finite root clauses, L1 researchers traditionally turn to two other linguistic phenomena that have been related to the root infinitive stage: 1) the relation between the presence (or absence) of the subject and the clause finiteness and 2) the
absence of root infinitives in *wh*-questions. In adult language, root clauses (i.e. main clauses) require either an overt subject (in non-null subject languages) or a null-subject *pro* (in null-subject languages). In embedded infinitival clauses, on the other hand, a null-subject PRO serves as the subject and overt subjects are not allowed. Therefore, in adult clauses, an overt subject (or null-subjects *pro*) will be found with an inflected verb form, whereas a null-subject PRO is found in infinitive clauses. Although children perform adult-like in embedded infinitival clauses, they diverge from the adult norm in that they allow inflected and non-inflected forms in main clauses.

Along with the fact that children show variation between finite and non-finite forms, it has been found that children’s finite forms cluster with overt-subject main clauses while non-finite forms cluster with null-subject main clauses. In non-null subject languages in particular, this finding has been taken as evidence that children’s syntactic knowledge is impaired and that their root infinitive clauses are indeed syntactically non-finite. Other evidence in support of the impairment view is the absence of infinitive forms in children’s *wh*-type constructions. Non-finite forms are practically non-existent in *wh*-questions and are basically limited to declarative sentences. Generally, it is assumed that adult finite clauses start with a CP head that serves as a host for *wh*-structures. If children do not produce non-finite forms in *wh*-questions but they do produce such forms in declarative sentences, this suggests that the syntactic structure of the child’s grammar is different from that of the adult and that children’s clauses do not contain all the elements of an adult finite clause.

Even though the impairment view (i.e., Wexler’s and Rizzi’s approaches) is predominant among L1 researchers, in an different approach to this phenomenon, Phillips (1995/2010) relates children’s errors with verb inflections to processing problems and suggests that they are due to
difficulties the child experiences merging the verb with the inflectional feature. Similarly, Legate and Yang (2007) put forward a proposal that relates root infinitives to a process of morphological learning and the structure of the language rather than to grammatical impairment. In what follows, I describe the main ideas of these four approaches in greater detail.

1.4.1 Deficient T Feature: Wexler (1994, 1998). In the first approach to the phenomenon, Wexler (1994) advanced the Optional Infinitive Stage (OI) to explain the variation between finite and non-finite forms in the child’s speech. The OI stage assumes that the representation of the T head is deficient in the child’s early grammar and, consequently, optionality between the two syntactic derivations is allowed by the child. Wexler argues that none of the derivations is more economical than another; therefore we may expect optionality between finite and root infinitive clauses in the child’s language. Although both derivations are considered to be equally costly, it is also assumed that the child recognizes finite and non-finite verbs as syntactically distinct. Wexler’s arguments are based on evidence from languages like French, where children have been shown to go through a stage in which they omit verb morphology. In French, finite verbs occur before the negative morpheme *pas* (as in 2a), whereas non-finite verbs are only allowed after *pas* (as in 2b):

(2)  
\begin{align*}
\text{(a) Jean} & \quad \text{n’aime} \quad \text{pas} \quad \text{Marie.} \\
& \quad \text{Jean neg-clitic likes not Marie} \\
\text{(b) Il est} & \quad \text{facile} \quad \text{de} \quad \text{ne} \quad \text{pas aimer} \quad \text{Marie.} \\
& \quad \text{It is easy to neg-CL not like-inf Marie.}
\end{align*}

If, as proposed by Wexler, children in the OI stage know that finite and non-finite forms are syntactically distinct, we would expect children to place the verb correctly with respect to *pas*. That is, children will only produce finite verbs before the negative *pas* and they will only
produce non-finite verbs after *pas*. Analyses of French data have revealed that children follow this rule and exceptions are practically nonexistent (Pierce 1992). From these findings, Wexler concluded that although children at the OI stage might seem to use finite and non-finite forms indiscriminately, these two forms are structurally different and children are aware of the differences between finite and non-finite forms.

In a later article, Wexler (1998) revised some of the assumptions of the OI stage and took into account the cross-linguistic differences found between languages. Wexler proposed that there is a constraint (*Unique Checking Constraint*) that regulates the child’s grammar. The Unique Checking Constraint (UCC) specifies that “The D-Feature of DP can only check against one functional category” (p.59). That is, D-Feature can be checked against TNS or AGR but not both. The application of this constraint will result in either TNS or AGR being omitted. Wexler further explains that children do have knowledge that functional categories (e.g. TNS and AGR) are required in simple main clauses. However, as demanded by UCC, because only one functional category could be checked off, the child will have to weigh whether or not to violate the property that specifies that a main clause must be specified for TNS and AGR. In this sense, the child’s grammar could be understood to be more restrictive than that of the adult in which the UCC does not apply. If the child’s grammar is regulated by UCC it would be expected that the OI would be manifested similarly in all children. However, this is not what has been observed. Wexler attributes these cross-linguistic differences to the properties of AGR across languages. He explains that in null-subject languages (e.g. Italian, Spanish) AGR is pronominal and, as such, it does not need a D-Feature to check it. Therefore, although in children acquiring a null-subject language UCC applies, double feature checking is not required. Thus, in Wexler’s words,
UCC only applies *vacuously* (p. 71). This would explain the differences found between children acquiring a null-subject language and those acquiring a non-null-subject language where double feature checking is required.

**1.4.2 Truncation Hypothesis: Rizzi (1993/1994).** Another approach is Rizzi’s Truncation Hypothesis (1993/1994). This framework establishes that an adult sentence consists of a CP and the sentence structure in the child’s early grammar is truncated. The hierarchical structure can be truncated at any point under the CP level, as illustrated in (3). All functional categories above the point at which the tree is truncated are not projected in the child’s grammar. Depending on where the truncation takes place, different results will arise in the child’s speech. For instance, if the structure is truncated below the level of the TP, we will expect root infinitives to emerge in the child’s speech, but if the structure is truncated above the TP, then the child will be able to produce the verb in its finite form (Montrul 2004; Rizzi 1993/1994).

(3)

According to Rizzi, all sentential structures start from category CP. However, in the child’s early grammar, this structure is not yet fully operative; instead the child’s structure can be
truncated in any of its layers and take another category rather than CP as its departure point of syntactic derivation. Rizzi’s claims are based on evidence found in children’s production; in particular in the type of structures the child allows or does not allow to occur with root infinitives.

Under the truncation hypothesis, root infinitives are not expected to occur with every type of sentence. *Wh*-questions, for instance, are argued to be incompatible with root infinitives. In these types of sentences, a CP must be projected in order to host a *Wh*-element. Therefore, since the lower layer must also be projected (e.g. IP), root infinitives are not expected in children’s *Wh*-questions. In fact, it has been found that root infinitives in *Wh*-questions are extremely rare in children’s data (Crisma 1992) thus supporting the claims made by Rizzi. This also happens with other structures in which a category above T must be projected (e.g., AgrS, Neg, Aux). Rizzi extends his analysis to Italian, a language in which root infinitives are rare. He proposes that because in this language verbs must raise to IP in order to pick up T and Agr features via movement, truncated structures are not to be expected.

Both the truncation hypothesis and the OI stage theory are competence models. Under these views, it is assumed that root infinitives are due to a problem with the child’s linguistic knowledge. Wexler claims that the functional head T is deficient in the child’s grammar whereas Rizzi adopts a more global view and maintains that whole parts of the clause structure may be truncated in the child’s grammar and not just a particular functional head. In both approaches, the relevant structures are expected to emerge once the child’s grammar matures, which seems to happen gradually at around the ages of 3 to 5. As for cross-linguistic differences, Wexler’s and Rizzi’s proposals make a categorical distinction between those languages that allow root
infinitives (e.g. English) and those in which root infinitives are not expected (e.g. Italian). They also do not actually account for the gradual decline in root infinitives in children.

1.4.3 Performance-Competence Model: Phillips (1995/2010). In a different approach to this phenomenon, Phillips (1995/2010) takes into account cross-linguistic differences observed among children learning different languages, as well as the gradual decline of non-finite forms observed in child speech. In contrast to previous approaches, he proposes a mixed performance-competence model. Phillips claims that children’s problems with verb morphemes are due to neither a deficient morphological or syntactic knowledge nor to an incompletely projected clause structure. According to this author, children’s root infinitive clauses contain all the elements of an adult structure, but in a child’s clause, the merger between the verb and the inflectional features has been delayed, generating a non-target form. Phillips explains that in adults, the task of accessing morphological forms is a more overlearned and automatic process that carries little or zero cost. However, in children, this same task is not yet fully automatic and the cost of accessing the morphological spell-out of the inflectional feature may be greater than the cost of failing to realize it. Thus, children produce root infinitive clauses not because they lack morphological knowledge or an impaired clause structure, but because they have difficulties using or accessing this knowledge. Phillips maintains that the cost of accessing morphological knowledge interacts with the linguistic behavior and movement of main verbs.

According to this view, the distribution of root infinitive forms in child data is explained by movement of the verb rather than by the type of structure (e.g. null subject vs. overt subject clauses). To support this claim, Phillips compared the distribution of root infinitive forms and subjects in verb-raising languages (e.g. French, German) and English, a non-verb raising
language. The analysis revealed that clustering between null-subject clauses and root infinitive forms is only observed in the former languages (i.e. verb raising) but not in the latter (i.e. non-verb raising). In English, the proportion of non-inflected and inflected forms in null-subject clauses was comparable to that of clauses with an overt subject. In languages where verbs raise, clustering of root infinitives and null-subject clauses happens because the verb fails to move to INFL. In such cases, Phillips assumes that “licensing of overt subjects is contingent on verb movement, and that INFL alone is not sufficient to license nominative case” (p. 96), and instead requires the INFL head to host a raised verb. That is, if the verb raises, it licenses an overt subject and it also picks up T and AGR features. If the verb remains in V instead of moving to INFL, then case-licensing requirements are different. Following Shlonsky (1987) and Baker (1991), Phillips posits that NPs that are interpreted semantically and not phonetically (e.g. null-subject pro) do not require case-licensing until LF, unlike overt subjects that must be case-licensed by the input to PF. As a consequence, if null-subjects in early childhood language are assumed to be pro, the verb must not move in order for null-subjects to be licensed. However, the verb must move for an overt subject to be licensed. In summary, Phillip attributes root infinitive distribution in verb-raising languages to differences in case-licensing requirements for null subjects and overt subjects rather than to the finiteness of the clause.

Regarding cross-linguistic differences, Phillip suggests that the proportion of root infinitives in children’s production is related to the morphological richness of the language. Phillips compared the data reported for children acquiring different L1s and found that there was a correlation between the morphological richness of the language and the rate of root infinitives. In languages in which the verb morphological system distinguishes no more than two forms in
any tense (e.g. English and Swedish), children show the highest rate of root infinitives. However, 
the proportion of root infinitives drops in children who are acquiring languages in which three or 
four forms are distinguished. This is the case for French, Dutch and German, for example. 
Finally, the children with the lowest rates of root infinitives are those who are acquiring very 
highly inflected languages, namely Spanish, Italian, Catalan or Hebrew.

Philips suggests that “some property of the richer inflectional paradigm facilitates the 
speeded automatization of inflectional access” (p.101). According to the author, it could be that 
in acquiring richer paradigms, children get more practice at accessing their morphological 
knowledge; but it could also be that the less-specific inflectional paradigms of poorly inflected 
languages are naturally harder to access. Children are expected to get better in the process of 
accessing inflectional features over time. They will improve up to the point at which the process 
becomes automatized for them and they will perform in an adult-like manner. If Phillips’ 
proposal is correct, it would help explain why root infinitives decrease gradually in child 
production and why children with different L1s show different rates of non-finites.

1.4.4 Variational Learning: Legate and Yang (2007). Similar to Philips’ approach, 
Legate and Yang (2007) take into account quantitative differences found across languages and 
highlight the role that the input may have in the child’s language development. They propose that 
“quantitative differences in the input data among morphosyntactic systems result in the cross-
linguistic variation in the RI phenomenon” (p. 315). However, Legate and Yang relate RIs to 
morphological learning rather than to the automaticity in accessing morphological knowledge. 
They explain that morphological learning will occur through a reward and punishment process. 
In explaining such process, Legate and Yang adopt a variational learning approach according to
which “the child’s language is modeled as a population of hypotheses whose composition changes during the course of learning” (p. 318). The possible hypotheses that the child could formulate are limited to the parameters specified by UG. Each parameter is linked to a probability. The probability of each parameter is in turn related to the linguistic input the child is exposed to. Depending on the linguistic data, the existence or extinction of a grammar could be rewarded or punished. Those grammars that are consistent with the input will be rewarded. However, other grammars within the UG space or those that are partially inconsistent with the linguistic input will be punished. A child learning a language will have available to possible grammars: [-Tense] or [+ Tense] and verbal forms can either reward or punish these grammars. According to Legate and Yang, evidence either rewarding or punishing these two grammars is expressed in the verbal morphology of the language. As such, the features that mark tense are language-specific and must be learned. In English, for instance, occurrences of past –ed will reward a [+Tense] grammar but will punish a [-Tense] one.

As with any learning process it will require data and it is expected to take time. To test their proposal, Legate and Yang evaluated three different languages that express tense (e.g. English, French, and Spanish) and measured the robustness of the verbal morphology rewarding a [+Tense] or [-Tense] in each of these languages. For the analysis, they used natural data from CHILDES database and it revealed that Spanish showed the greater quantitative evidence rewarding a [+Tense] grammar, English showed the least evidence, whereas French was placed between the two extremes. That is, Spanish has numerical advantage over French, and French and Spanish over English grammar. Legate and Yang compared these measurements to the rate of morphological mastering observed in children and they found that children learning Spanish
overcome root infinitive forms at a faster rate than those learning French. Moreover, both Spanish- and French-speaking children drive out the [-Tense] grammar faster than English speaking children; thus, creating a continuum. From their analysis, Legate and Yang concluded that verbal morphological development in children is frequency sensitive and it relies on probabilistic learning. However, as they state, “this in no way denies or replaces the critical assumption of UG. After all, the selection of grammars in learning requires a pool of candidates to select from, and that is supplied by parameters and UG” (p.340). Therefore, on one hand, this approach recognizes the existence of the Faculty of Language of UG, but on the other, it takes into account the (quantitative) differences between the languages and the effects that they may have on the child’s language development.

1.4.5 Competence Model Versus Quantitative Models. In sum, L1 acquisition is characterized by a root infinitive stage and it is expected that L1 learners will go through a stage in which they will show morphological variation. It is also expected that the child will gradually shift from the root infinitive stage to the adult norm. However, it is important to note that this stage is not manifested in the same way in all children and we must take into account the L1 and its morphological richness when analyzing verb morpheme acquisition in L1 learners.

The reason why children fail to realize verb morphemes is still unclear. Until recently, it was generally assumed that root infinitives were due to some kind of grammatical impairment. However, another kind of explanation has been proposed by Phillips (1995/2010) and Legate and Yang (2007). Under Phillips’ approach, root infinitive clauses are not related to the child’s morphological knowledge but rather to the child’s capacity to access this knowledge. Legate and Yang, similar to Phillips, relate root infinitive to quantitative factors, but they argue that
children’s grammar is a statistical group of possible adult-like grammars (e.g. [+Tense] and [-Tense] grammars). With the help of input, the child will gradually eliminate the non-target grammars and will perform adult-like. The claims made by the quantitative models (Phillips 1995/2010; Legate & Yang 2007) as well as those of the competence model are based on child L1 speech data. To the best of my knowledge, the theoretical approaches that have been advanced to explain the root infinitive stage in children have been exclusively based on production data. Therefore, we may consider two alternative models: on one side are the competence models (i.e. Wexler’s deficient feature and Rizzi’s truncated structure) that maintain that the child’s grammar is impaired; and on the other side the quantitative models. (E.g. Phillips’s performance-competence model) claims that root infinitives are related to performance difficulties and that the child’s failure to merge the verb with its inflection is due to the lack of automatization of such a process. Legate and Yang suggest that children need to learn the morphological system of the language. Learning rates will vary among children acquiring different languages. The speed at which the child will eliminate the [-Tense] grammar will depend on how robust is the evidence (either rewarding or punishing a [+Tense] grammar) available in the linguistic data.

Although the two types of approaches seem to be valid explanations for the root infinitive stage in L1 learners, there are several open questions about which of these models better explains children’s morphological variation. Phillips, for instance, argues that neither Rizzi’s nor Wexler’s analysis adequately explains the root infinitive stage in L1 acquisition. According to this author, Rizzi’s arguments are based on incorrect assumptions about what causes root infinitive distribution. While Rizzi maintains that the occurrence of root infinitives is explained
with the mechanism of clause truncation, Phillips states that verb movement is what really accounts for the distribution of root infinitives in the child’s language. For instance, Rizzi relates children’s root infinitives to a sentence structure projection that is truncated. This analysis predicts that children will produce root infinitives in declarative phrases but not in Wh-questions. This is because it is assumed that in this type of question, the CP must be projected. Philips, however, rejects this analysis and argues that the lack of root infinitives in Wh-questions is not explained by the required presence of CP but rather by the fact that, in these types of sentences, the verb must raise to I first and then to C; as such Rizzi’s arguments do not hold true when extended to subject Wh-questions in English (e.g. who always wins?), a sentence structure that does not require verb movement to C. As expected by Philips, in the data of English-speaking children, root infinitives occur in subject Wh-questions at a similar rate as they appear in declarative sentences. In response to Wexler’s approach, Phillips argues that it is not likely that the child’s tense knowledge is deficient; there is strong evidence that when children use verb inflections they use them correctly, which may indicate that children have at least basic knowledge of tense. Phillips further observes that if, as claimed by Wexler, there is real optionality between the two derivations (i.e. root infinitives and finites) in the child’s grammar, then it would be expected that children show similar rates of root infinitives regardless of the language and maintain similar rates of root infinitives throughout the whole stage.

Traditionally, studies of L1 acquisition have assumed that the root infinitive stage is related to a child’s grammatical competence. While it is true that both pure competence models are elegant theories in predicting children’s linguistic behavior, they fall short in offering a comprehensive explanation as to why children go through this stage and why children learning
different L1s vary. The quantitative proposal seems promising because it takes into account cross-linguistic differences, the rate of root infinitives across languages, and the gradual decline of root infinitives in child speech. However, this model fails to predict the specific conditions in which children are more likely to produce a root infinitive form instead of an inflected one. Therefore, although the root infinitive phenomenon has been thoroughly studied in L1 acquirers, there is still no agreement as to what prevents children from performing in a target-like manner.

1.5 Verbal Morphology in L2 Acquisition

One of the most important debates held in L2 acquisition research is whether and to what degree child L2 and adult L2 learners have access to functional features (e.g. T, Agr). There are two sides of the coin on this issue. On one side, there are those who pose that functional features are impaired or not available to L2 learners, while on the other side, there are those who claim that features are available to learners but that processing or phonological problems diminish the learner’s capacity to perform target like. In what follows, I describe the main theoretical approaches that have been put forward to explain L2 learners’ performance.

1.5.1 Impairment Approach. The Impairment approach holds that learners’ lack of success derives from their lack of grammatical knowledge of the target language (Eubank 1993/1994, Eubank & Grace 1996; Hawkins & Chan 1997; Meisel 1997; Vainikka & Young-Scholten 1994). These claims are mainly based on the fact that adult learners frequently fail to produce inflectional morphemes. According to this view, functional features like T and Agr are not available to L2 learners; and because of this, learners are not able to achieve target-like performance. Eubank (1994) argues that the absence of tense and agreement inflections in L2 learners’ speech proves that there is some type of deficit in the learner’s L2 competence. For
Eubank (1996), functional categories are available to learners but feature strength associated with these categories is permanently impaired. Likewise, Meisel (1997) studied L2 learners of German and found that learners were using finite forms where non-finite forms were required and vice versa. From these findings the author concludes that T and Agr features are impaired in the L2 grammar and that learners do not distinguish between inflected and non-inflected forms. In similar grounds, Vainikka and Young-Scholten (1994) argue that in the initial states, only lexical categories are available to learners and functional categories develop later in the acquisition. Another similar position is Hawkins and Chan (1997), who advanced the Failed Functional Features Hypothesis (FFFH). The main claim of the FFH is that functional features are subject to a critical period. Beyond this period (sometime during childhood), functional features are not expected to be accessible to L2 learners. Nonetheless, a syntactic representation may be built for those functional feature specifications which are similar in the learner’s L1 and L2. That is, in domains that the L1 and L2 share similar functional feature specification, the learner’s syntactic representation will be close to that of natives. However, for those domains where functional features are not shared by both languages, the learner’s syntactic representation will differ from that of the native speakers.

1.5.2 Non-Impairment Approach: Missing Surface Inflection Hypothesis. The second approach, on the other hand, argues that learners’ competence is not impaired. Instead, it maintains that learners have access to L2 functional features, like Agr and T, but variability results from either a processing problem (Haznedar & Schwartz 1997; Haznedar 2001; Ionin & Wexler 2002; Lardiere 1998; Prévost & White 2000) or phonological problems (Goad, White & Steele 2003; Goad & White 2006). The approach that relates learners’ failure to perform target-like
to processing problems is commonly known as the Missing Surface Inflection Hypothesis (MSIH). Under this view, it is claimed that learners have problems mapping tense features to the appropriate surface forms (Haznedar & Schwartz 1997; Haznedar 2001; 2003; Lardiere 1998; Prévost & White, 2000). Non-impairment arguments are based mainly on the assumption that syntactic knowledge in learners is intact or complete. Studies have reported that learners are able to produce complex syntactic structures that require functional features (e.g. inverted wh-questions and complement clauses) despite the fact that they may show low rates of tense and agreement inflection. Also, the data has revealed that learners do not use finite and non-finite verbs randomly and that when learners do produce inflections, most of the time they are used correctly. All of these findings have led researchers to the conclusion that functional features are available to L2 learners. Moreover, some have concluded that, in L2 acquisition, the development of inflectional affixation and the syntactic knowledge of formal features are dissociated (Lardiere 1998). Thus learners may acquire T and Agr features first and later develop verb morphology. In light of these claims, supporters of the MSIH posit that functional categories are present in the learner’s grammar, but mapping problems may prevent him from producing the verb morpheme.

Whether the morphological variation reported in L2 acquisition is caused by some kind of impairment in the learner’s grammar or if it only indicates a processing problem that learners experience is still debatable. On one hand, the research on L2 verb morpheme acquisition has shown that learners frequently drop verb morphemes, even after being exposed to the target language for a long period of time. This persistent divergence from the native norm might lead us to conclude that learners’ difficulties derive from a grammatical impairment and that they
have incomplete knowledge of the L2 grammar. Although these claims are valid, researchers have also found that learners produce highly complex linguistic structures that require knowledge of functional features. Learners’ production suggests that they have knowledge of the verb-raising status of the language and that the IP exists in the learner’s grammar. Syntactic placement of verbs and Neg is practically native-like in L2 learners. L2 learners correctly placed inflected and non-inflected verbs in terms of the negative elements; thus showing that they have acquired the verb-raising rules of the L2 (Haznedar 2001; Prévost & White 2000). It has also been found that agreement errors are scarce in L2 learners. Although the learner tends to omit verbal inflections, when used, they are correct in most of the cases (Haznedar & Schwartz 1997; Haznedar 2001; 2003; Lardiere 1998; Prévost & White, 2000). This finding has led to the conclusion that functional features are available to learners, but processing problems prevent them from performing at target-like levels.

The impairment and the MSIH approaches make different predictions regarding learners’ performance. If functional features are not available and the grammar is impaired as proposed by the impairment approach, then we would expect learners to have difficulties across the verbal system and across languages. For instance, learners may have difficulties with regular and irregular verbs and learners learning different L2s may show similar difficulties. The learner is also expected to have problems not just with morphology suppliance but with other syntactic processes related to the relevant functional feature. In addition, we will expect learners to have similar difficulties producing and comprehending verbal morphology. As for the predictions made by the MSIH, if the learner’s difficulties are due to processing problems, as it is proposed, we would not necessarily expect learners to perform similarly with regular and irregular verbs or across languages. Neither would we expect
learners to perform equally well in production and comprehension. Moreover, we would not expect other syntactic processes related to the functional feature to be affected. In other words, mastering verbal inflection does not need to parallel the learner’s syntactic development.

Another approach that suggests the learner’s grammar is not impaired is the Prosodic Transfer Hypothesis (PTH). However, rather than suggesting that learners’ lack of success is due to processing problems, as it is claimed by the MSIH, the PTH relates learner’s difficulties to phonological problems. A description of this approach is presented below.

1.5.3 Prosodic Transfer Hypothesis. The PTH relates L2 learners’ difficulties with morphology to phonological problems. It claims that the prosodic structure of the learner’s L1 may have an effect in the morphology of the target language. According to this view, if the learner’s L1 has a prosodic structure that differs from that of the L2, then the learner will have problems producing the inflection and may omit it. Goad, White, and Steele (2003) state that “L1 prosodic structure constrains interlanguage production” (p. 246). Goad and White (2006) also maintain that “L1 prosodic constraints do not act as a filter in comprehension, which could prevent the establishment of the necessary syntactic representations in the L2” (p. 246). That is, differences in the prosodic structure of the L1 and the L2 are expected to only affect production, while comprehension is not expected to be affected. Nevertheless, recent work has reported that the prosodic structure may indeed have an effect in the learner’s abilities to comprehend verbal morphemes in the target language (Lieberman to appear).

The PTH assumes that the prosodic structure is organized hierarchically and includes the following components: Prosodic Phrase, Prosodic Word, feet and syllable (Nespor & Vogel 1986; Selkirk 1986). See the structure in (4):
According to the PTH, differences in the prosodic structure will make morphemes harder to master for L2 speakers. Nevertheless, the PTH does not claim that differences in the prosodic structure will prevent the learner from acquiring the inflection, but that, initially, it will make it more problematic to master. The learner will be able to improve and accommodate the representation for the target inflection by two means: by combining licensing relations available in the learner’s L1 and/or by involving L1 structures being licensed in new positions (Goad & White 2006, p 247). If neither of these conditions is met, then the representation will not be acquired and it will become fossilized in the learner’s grammar.

Therefore, under this approach, like in the MSIH, it is assumed that the learner’s grammar is not impaired. However, unlike the MSIH, the PTH proposes that we have to look at the prosodic structure to explain the learner’s performance. The prosodic structure is assumed to play a key role in the learner’s success with the morphology of the target language. Thus, those who advanced the PTH claim that we have to take into account the similarities and differences found between the prosodic structure of the learner’s L1 and the L2 in order to understand morphology acquisition in L2 learners.
One of the purposes of the present study is to ascertain what linguistic knowledge do child L2 learners have. Is the learner’s grammar impaired or not? Looking at verbal morphology acquisition across languages (i.e. English and Spanish) will allow us to study whether or not the process of verbal morphology acquisition is similar across languages. This, in turn, will offer some insight into child L2 learners’ linguistic knowledge and their general process of language acquisition.

1.6 Language Modality: Production vs. Comprehension

The second goal of the study is to evaluate the connection between the type of task (i.e. production vs. comprehension) and second language learners’ performance. Do child L2 learners perform similarly across tasks or do they show asymmetry between language modalities? Both production and comprehension are assumed to access a common grammatical system. Therefore, if we aim to describe learners’ linguistic knowledge, we must test both their production and comprehension. Evaluating and comparing learners’ performance between modalities would allow us to address broader issues in child L2 acquisition. For instance, it would allow us to address the question of whether both verbal production and comprehension develop at the same time in child L2 learners or, if instead, one modality precedes the other. It would also offer valuable information about whether or not child L2 learners have access to functional features.

In order to study learners’ performance across language modalities, we must first refer to the difference between competence and performance, a distinction that has come to be regarded as essential in linguistics, particularly within the generative program (Chomsky 1965). Competence refers to the internalized linguistic knowledge that a speaker has of his or her language. This knowledge enables the speaker to produce and understand utterances in that
language. In other words, competence is the knowledge that a speaker-hearer has of the system (grammar) of a language. This system informs the speaker about the structures that are allowed and those that are not.

Performance, on the other hand, is the actual use of such linguistic knowledge in the production or perception of an utterance. In contrast to competence, performance may be affected by extra-grammatical factors such as the speaker’s emotional state, memory limitations, and fatigue, among others. Although native speakers may produce grammatical errors, these are relatively infrequent and are not due to a lack of grammatical knowledge but are instead considered to be the result of some type of breakdown in the process of producing an utterance. Chomsky explains the difference between these two concepts as follows:

“Linguistic theory is concerned primarily with an ideal speaker-listener, in a completely homogeneous speech-community, who knows its (the speech community's) language perfectly and that it is unaffected by such grammatically irrelevant conditions as memory limitations, distractions, shifts of attention and interest, and errors (random or characteristic) in applying his knowledge of this language in actual performance.” (Chomsky 1995, p. 3)

In L1 acquisition, it is assumed that, typically, developing children will successfully acquire their language and will have a full and complete knowledge of its grammar. However, in L2 acquisition, such success is not guaranteed and learners’ knowledge of the L2 grammar may differ from that of native speakers (Bley-Vroman 1990; White 1999; Selinker 1996). L2 learners’ grammar may be incomplete with respect to the target or fossilized (Selinker 1972). Learners’ acquisition of the L2 grammar may be affected by numerous factors such as the learner’s L1, the age of acquisition, and length of exposure to the target language, among others. Thus, L2
speakers’ errors may be of two types: learners’ performance may be affected not only by extra-grammatical factors (e.g. fatigue, motivation) but may also reflect incomplete knowledge of the L2 grammar. Therefore, higher degrees of variability should be expected in an L2 learner’s performance than in that of native speakers. Additionally, the learner’s grammar changes in the process of acquisition. Learners may still be acquiring new structures that were absent before; some structures may still be modified, while others might never be acquired. Thus, L2 learners’ competence should be treated as a developing and dynamic system while that of native speakers is considered to be a static, final state system. The emerging grammatical system that an L2 learner develops is known as interlanguage (Selinker 1972).

A learner’s interlanguage (IL) may diverge from the target grammar in various domains. For example, learners may show morphosyntactic, semantic and/or phonological errors. Although errors may be frequent in L2 learners, it is unclear whether these can always be taken as evidence of lack of grammatical knowledge. Instead, some have claimed that learners’ real grammatical knowledge is not always shown in their performance and that it indeed “falls far short of their underlying grammars” (Klein & Martohardjono 1999, p.18). For example, Lardiere (1998) maintains that omission of morphology in L2 production cannot be taken as evidence of absence of the corresponding grammatical representations, but rather that the learner’s variability results from processing and/or performance problems. However, there are others who claim that grammar representations are not available to learners and that errors in production indicate a lack of knowledge (Eubank 1993/1994, Hawkins & Chan 1997, Meisel 1997). That is, learner’s oral production is generated by a system that has not converged on the target-grammatical system. These two approaches maintain opposite views about learners’ errors. If we aim to distinguish
between those theories that propose a grammatical impairment and those that invoke
performance difficulties, our conclusions about the status of the learner’s grammar (impaired vs.
non-impaired) cannot be drawn from one type of data alone (e.g. production). Instead, evidence
from other domains (e.g. comprehension) will be required (Grüter 2005). It is, nonetheless, still
debatable whether production or comprehension is more informative about speakers’ linguistic
knowledge. The reasoning behind this comes from another of the generative model’s
assumptions.

One of the assumptions within the generative model is that a common grammar underlies
both language production and language comprehension.

[T]here must be, represented in the mind, a fixed system of generative principle that
characterizes and associates deep and surface structures in some definite way—a grammar, in
other words, that is used in some fashion as discourse is produced or interpreted. This
grammar represents the underlying linguistic competence to which I referred earlier.
(Chomsky, 1972, p.18)

That is, when a speaker produces or interprets an utterance, he or she is using the same linguistic
knowledge in both of these processes. Hence, a theory of grammar should aim to describe and
explain the grammatical knowledge underlying both modalities.

However, it is important to note that the generative assumption of a common grammar
system does not deny that two separate systems are involved in each of these processes. When
learners produce or hear a sentence, they are engaged in two different cognitive processes and
the demands made on the learner are distinct. For instance, production tasks have been said to be
very demanding in the sense that the speaker has to access, retrieve and convert a conceptual
representation into an articulatory or phonetic plan (Carroll 1999; Levelt 1978; Sharwood Smith
All this may in turn have an effect on the learner’s speech, which has been said to be less automatic than that of native speakers (Crookes 1991, Levelt 1978).

In contrast, in comprehension, specifically in perception tasks, the learner has to analyze a speech stream and convert it into a ‘mental representation’ to which meaning is given (Carroll 1999). How learners break down an utterance into its various components is not yet clear, but it is argued that parsing in adult L2 learners is different from that of native speakers (Clashen & Felser 2006).

If we assume that the speaker uses a common underlying grammar for production and comprehension, this will allow us to make some predictions about the grammatical knowledge of the learner. If grammatical representations are absent from the learner’s grammar, as posed by the impairment approach (Eubank 1993/1994, Hawkins & Chan 1997, Meisel 1997), then the grammatical deficit should have an effect on both production and comprehension. The learner’s performance will be similar across modalities. However, if only one modality is found to be affected; that is, if the learner shows asymmetry between her performance in production and comprehension, this will be evidence against the impairment view.

It is generally assumed that adult native speakers are able to produce whatever they can understand and are also able to understand whatever they can produce. However, lack of convergence between modalities has been found in L2 learners. Studies have found that production and comprehension do not always converge in child L2 learners and dissociation between modalities may occur (Grüter 2005; Ionin & Wexler 2002; Unsworth 2007). Yet a unique pattern has not been found; for instance, acquirers may do better in comprehension (Grüter 2005, Ionin & Wexler 2002) but they may also do better in production (Unsworth 2007).
Asymmetries between tasks, however, are not exclusive to L2 acquisition and asymmetries in L1 acquisition have been reported (Avrutin & Wexler 1992; Baauw, Escobar, & Philip W. 1997; Champman and Miller, 1975; Chien & Wexler 1990; Johnson, de Villiers and Seymour 2005; Perex-Leroux 2005). Asymmetries in L1 acquisition are related in one way or another to the maturation of the child (e.g. cognitive maturation, immature pragmatic knowledge). Once they reach a certain age, children are expected to perform in an adult native-like manner. Child L2 learners, because they are young, may also show age-related linguistic behavior. If tested at an age where L1 children have not yet mastered the form being examined, then we may expect both groups to perform similarly (Unsworth 2007). If tested after this time, then we may expect children’s performance to be related to their knowledge of the L2 grammar (Grüter 2005). Therefore, studies on asymmetries may offer new insights into similarities between child L2 and L1 acquisition as well as insights into learners’ actual grammatical knowledge.

In sum, the present study has two main goals: (1) to ascertain whether children are able to produce verbal inflection and whether they are able to comprehend it; and (2) to determine whether cross-linguistic differences found between English and Spanish verbal inflectional systems play a role in the acquisition of verbal morphology by child L2 learners or whether, on the contrary, the acquisition of verbal inflection is similar for all children regardless of the target language. This investigation is expected to shed light on child L2 learners’ grammatical knowledge and on how cross-linguistic differences found in the target languages may affect the acquisition.
1.7 Current Study

The current study consists of four experiments that examine subject-verb agreement production and comprehension in child L2 learners of English and in child L2 learners of Spanish. It studies the connection between the type of task (i.e. production vs. comprehension) and child L2 learners’ performance. In addition, it will be determined whether the target language plays a role in child L2 learners’ morphological acquisition.

Overall, two research questions guide this study. The first research question is related to learners’ performance across tasks. In particular, are child L2 learners of English and Spanish affected in the same way in both the production and the comprehension of verbal morphology? Do children perform similarly across tasks or do they show an asymmetry? The second research question asks how successful child L2 learners of English and child L2 learners of Spanish are at producing and comprehending subject-verb agreement inflection. Are problems with verbal morphology observed in the two languages? In other words, are verbal inflections equally problematic to all child L2 learners; or are there crosslinguistic differences like those observed in L1 acquisition (e.g. highly inflected vs. poorly inflected languages)? These questions aim to determine child L2 learners’ actual linguistic knowledge.

If L2 learners’ difficulties are related to the absence or unavailability of functional features as proposed by the impairment view, then we would expect verbal morphology to be problematic in both production and comprehension. We would also expect verbal inflections to be similarly problematic across learners regardless of the language they are learning. However, if learners’ difficulties with verbal morphology are related to other factors (e.g. processing problems, prosodic problems) rather
than with the availability of functional features, then we may expect differences across languages and across language modality.

1.8 Organization of Current Study

The structure of this dissertation is as follows. Chapter 2 gives an overview of the Spanish and English verb agreement systems. Chapter 3 reviews research done on the acquisition of verb morphemes by L1 and L2 learners of these two languages. The fourth and fifth chapters present the methodology and results of the Spanish and English experiments, respectively. Chapter 6 describes the cross-linguistic differences between learners’ L1 and L2. Finally, in Chapter 7 the implications of the findings and conclusions of the study are discussed. This chapter also includes a section discussing the limitations of the study and avenues for future studies.
CHAPTER 2

SPANISH AND ENGLISH VERB AGREEMENT SYSTEM

As part of this study, I want to analyze whether the structure of the target language has an effect on child L2 learners’ performance. Adopting a cross-linguistic approach, I attempt to ascertain whether typologically distinct languages generate different patterns of acquisition. To address this issue, the acquisition of verb-subject agreement in Spanish and English child L2 learners will be examined. In this chapter, the verbal systems of both Spanish and English will be described and compared.

2.1 Agreement

Before describing the verbal systems of Spanish and English, we need to first define what is meant by agreement and how to determine if two forms agree. Agreement is a grammatical phenomenon that exists in many languages (Mallinson & Blake 1981). Two or more linguistic forms are said to agree when they are alike in gender, number, case, or person. For instance, in both English and Spanish, the subject of a clause must agree in number with the verb. Thus, a singular noun phrase must occur with a singular verb and a plural noun phrase must occur with a plural verb as in (6) and (7). However, it is not enough for two forms to be alike in the relevant properties; the properties of these two forms must also be in systematic covariance (Corbett, 2006). That is, if one of the forms is singular, the other form also needs to be singular and if this property varies in one of the forms then it will also vary in the other.

(6)  a. The girl is in the park. (SG)
     b. The girls are in the park. (PL)
First, we must keep in mind that although the properties of the forms are in covariance, agreement is only determined by one of the forms. The element that determines agreement is called the *controller* and the element on which agreement features (e.g. number) are imposed is called the *target*. Thus, agreement is assumed to be a directional and a dependency between two elements (Corbett, 1994). Secondly, the properties involved in agreement are assumed to be properties of nominal elements. In a subject-verb agreement relationship, the number of the verb is determined by the subject and not vice versa (Corbett, 2006). Subject agreement, then, might be understood or defined as the process by which the subject (i.e. agreement controller) comes to be expressed on the verb (i.e. agreement target). According to Corbett (2006), such a process is mainly a matter of syntax and because agreement may be expressed by adding affixes to the base word, it is argued to be “the major interface problem between morphology and syntax” (Corbett, 2006, p. 3). Agreement, then, may be described in terms of the morphology and the syntax of the language. How agreement is expressed in both of these domains may vary between languages. This is the case of English and Spanish. Although both languages show subject-verb agreement, there are differences in the way it is realized in both the morphology and syntax of each language.
2.2 Spanish Subject-Verb Agreement: Morphology

Spanish is considered to have rich verbal morphology. In this language, all verbs have infinitives and inflected forms. Spanish infinitives are classified into three different types according to the thematic vowel in the form ending. Infinitives can end in –ar, as in *cantar* (to sing), -er, as in *beber* (to drink) or –ir, as in *dormir* (to sleep). Spanish finite verbs are inflected for person, number, tense, aspect and mood. Not only do inflections give us information about semantic properties such as tense (past vs. present), aspect (perfective vs. imperfective) and mood (indicative vs. subjunctive), but also grammatical information about the subject (person and number), which indicates that in Spanish there is a close connection between subject and verb morphology.

As Table 2.1 illustrates, in Spanish, most verbs must agree in person and number with the subject of a sentence. Only the 3rd person singular lacks specific morphology since it only carries the thematic vowel of the verb.

<table>
<thead>
<tr>
<th></th>
<th>SG.</th>
<th>PL</th>
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<tbody>
<tr>
<td>1st</td>
<td>Cant-o</td>
<td><em>I sing</em></td>
</tr>
<tr>
<td>2nd</td>
<td>Canta-s</td>
<td><em>You sing</em></td>
</tr>
<tr>
<td>3rd</td>
<td>Canta</td>
<td><em>He sings</em></td>
</tr>
</tbody>
</table>
Spanish has been classified as a null-subject language (i.e. subjects in this language are not obligatory and can be omitted). Most Spanish sentences do not require an overt subject (8a). There are only a few contexts that require the speaker to produce a subject (e.g. focus, contrast, change of subject). See example in (8b). Otherwise, the subject is regulated by pragmatic factors and its use is optional and it may or may not appear in the sentence. However, if the sentence lacks an overt subject, its information can be retrieved from the verb. Thus, speakers can rely on the information provided by verb morphemes to indicate the person and number of the subject.

(8)  a. Estudia en las mañanas
    Study-3rd.sg. in the mornings
    He/she study in the morning

    b. Él estudia en la mañana y Ella estudia en la tarde.
    He study-3rd.sg in the morning and she study-3rd.sg in the afternoon
    ‘He studies in the morning and she studies in the afternoon’

In a null subject sentence like (9a), the verb juega indicates that the subject of the sentence is 3rd person singular. However in (9b), the presence of the affix –n in the verb juegan informs the hearer or reader that the subject of the sentence is 3rd person plural. Regardless of whether the subject is overt or not, the verb needs to agree with the subject of the sentence. Both the number of the subject to which the speaker is referring and the number of the verb must match.

(9)  a. Juega en el parque
    play-3rd.sg. in the park
    ‘He/she plays in the park’
b. Juegan en el parque
   play-3rd.pl. in the park
   ‘They play in the park

2.3 English Subject-Verb Agreement: Morphology

In contrast to the Spanish verbal system, the English verbal system has a poor inflectional morphology. Lacking infinitival morphology, lexical verbs are just inflected for tense (e.g. past – ed) and only in the present tense do verbs mark agreement with the 3rd person singular as shown in Table 2.2. This is the opposite of what happens in Spanish where most verbs have verbal inflection.

Table 2.2

English verb inflectional system

<table>
<thead>
<tr>
<th>To talk (infinitive)</th>
<th>Present-tense</th>
<th>Past tense (-ed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st</td>
<td>I talk</td>
<td>I talked</td>
</tr>
<tr>
<td>2nd</td>
<td>You talk</td>
<td>You talked</td>
</tr>
<tr>
<td>3rd</td>
<td>He/she/it talk-s</td>
<td>They talked</td>
</tr>
<tr>
<td>PL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st</td>
<td>We talk</td>
<td>We talked</td>
</tr>
<tr>
<td>2nd</td>
<td>You talk</td>
<td>You talked</td>
</tr>
<tr>
<td>3rd</td>
<td>They talk</td>
<td>They talked</td>
</tr>
</tbody>
</table>
English is a non-null subject language. Overt subjects in this language are not optional but obligatory. Thus, verbs must be accompanied by an overt subject. English speakers usually do not need to rely on the verb ending to identify whether the subject of the sentence is singular or plural. If an English speaker hears a sentence like the one in (10a), she will be able to tell that the subject of the sentence is plural without having to rely on the verb inflection. However, if the number of the subject is ambiguous (e.g. nouns with identical singular and plural), the verb ending might be used to identify the number of the subject. If a speaker hears a sentence like (10b) that includes the noun fish which has the same form for the singular and plural, she can rely on the verb ending and successfully tell that the sentence is about one fish and not two or more fish.

(10)  

a. The cats play with the toy.  
b. The fish swims in the sea.

2.4 Subject-Verb Agreement: Syntax

The syntactic process by which verbs get agreement has long been a subject of investigation by researchers in the field of generative syntax. In this area of inquiry, features and their role in language variation and acquisition have been a central issue. In the Chomskyan view, functional categories, like agreement (Agr), are conceived to be a bundle of abstract features (e.g. [+/- strong Agr]) and languages are assumed to have an available set of features from which they make a selection. Agreement features are in the noun and in the verb. One language may select the [-strong] Agr feature while another may select the [+ strong] feature. The different combinations of features, then, give rise to cross-linguistic variation.
In the late 1980s and 1990s, discussions among generativists were mainly centered around the hierarchical structure of the clause and on whether the morphosyntactic features of Agr and T were found in a unique functional head. Traditionally, it was assumed that the features of Agr and T were both found in the Inflectional Phrase (IP) (Chomsky, 1957). However, later on Pollock (1989) challenged this view and proposed that these features indeed had their own functional head or projection in the clause structure. In this analysis, which was known as the Split-INFL approach, IP was divided into two distinct categories: agreement phrase (AgrP) and tense phrase (TP). A question that arises from the assumption that IP hosts two categories is whether AgrP is in the highest projection or whether TP occupies that place. The answer to this question comes from morphological evidence. Under the Split-INFL approach, verbs need to move to get features of Agr and T. If, as proposed, verbs move and if they move first to the closest head position available, then we can expect the ordering of the morphemes to reflect such derivational process (Belletti, 1990; Haegman & Guéron, 1999). Two alternative predictions may be drawn from these assumptions: (1) V moves first to Agr and then to T, and (2) V moves first to T and then to Agr. According to (1), we would expect Agr inflections to be placed closer to the verb root than the T inflections. Prediction (2) leads to the opposite conclusion, (i.e. T inflections are placed closer to the verb root). In a language like English, because of its impoverished morphology, it is hard to verify these two opposing alternatives. However, Spanish offers an insight into how features are distributed in the hierarchical syntactic structure.

Morpheme ordering in Spanish supports prediction (2). As shown in Table 2.3 below, T inflections are closer to the verb root than Agr inflections; this leads us to interpret that Agr is in a higher position than T. In other words the verb moves first to T and then to Agr. Morpheme
ordering is more evident in the past imperfect tense where T and Agr morphemes can be easily identified. In the present tense, it is more difficult to distinguish between T and Agr. For example, the present tense forms of the verb to speak are: hablo (1sg), hablas (2nd), habla (3rd) hablanos (1pl), and hablan (3pl). As it can be observed in the present tense, there are no clearly distinguished inflections corresponding to tense and agreement respectively.

Table 2.3

*Morpheme ordering in Spanish*

<table>
<thead>
<tr>
<th>NP</th>
<th>V</th>
<th>T</th>
<th>Agr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1sg (yo)</td>
<td>Habl</td>
<td>ab</td>
<td>a</td>
</tr>
<tr>
<td>2sg (tú)</td>
<td>Habl</td>
<td>ab</td>
<td>as</td>
</tr>
<tr>
<td>3sg (él)</td>
<td>Habl</td>
<td>ab</td>
<td>a</td>
</tr>
<tr>
<td>1pl (nosotros)</td>
<td>Habl</td>
<td>ab</td>
<td>amos</td>
</tr>
<tr>
<td>3pl (ellos)</td>
<td>Habl</td>
<td>ab</td>
<td>an</td>
</tr>
</tbody>
</table>

| Speak | PAST | person + number |

The Split-INFL analysis assumes that the structure of the sentence is as shown in (11) (Pollock 1989). The Split-INFL approach led to additional research aimed at describing the syntactic structure of the sentence, which, from that moment on, was analyzed as a complex system of inflectional heads, each one with its own morphosyntactic and semantic properties. Namely, nominal features of the verb, such as person, number agreement, and nominative case assignment, are assumed to be regulated by the category AgrP, whereas verbal features of the
verb, such as T, are regulated by the TP. However, following the standard practice in the literature and for the sake of exposition, I will often use labels I and IP as a shorthand representation of the nodes Agr and T.

(11)

In a later work, Chomsky (1991) argues that there are two types of verb agreement. According to this analysis, in a transitive sentence (e.g. The girl reads the magazine), the Agr features of the subject need to be checked with an Agr head, but the object is also required to check its features in an Agr head. Chomsky proposes an extended basic clause structure in which a sentence not only has an agreement projection for a subject (AgrSP) but also a projection for an object (AgrOP), as shown in the structure in (12).
My study focused on AgrSP; that is, I am interested in the subject-verb agreement relation. Agreement features in AgrSP match those in the NP, in particular those of the sentence subject which occupies the Spec of the AgrSP, as in the structure in (12). According to Radford (2004), Agr features get applied to the verb by a Feature-Copying Operation. Because of this operation, the features of the subject are copied onto the verb allowing the features of person and number to be assigned to the verb of the sentence.

Following Pollock’s Split-INFL analysis, languages have been divided into two types: [+strong] Agr feature languages and [-strong] Agr feature languages. In languages with a [+strong] Agr feature, all verbs, auxiliaries and thematic (lexical) verbs, must raise out of the VP to acquire Agr and T. For instance, in the Romance languages, thematic verbs and auxiliaries need to move from V to I (Emonds 1978; Zagona 2002). Additionally, verb movement in [+strong] Agr languages is overt and takes place in the syntax (Pollock, 1989, 1997). French is
typically considered a prototypical verb-raising language and, as such, it offers evidence of verb movement in the syntax. English, on the other hand, is a non-verb-raising language because it lacks thematic verb raising and requires affix lowering for thematic verbs to acquire agreement (Chomsky 1957, Radford 2004). Verb movement in this language is covert and takes place in Logical Form (LF). The verb-raising status of a language has been related to syntactic properties such as negation placement and adverb placement. Negation particles and adverbs are expected to occur in certain positions depending on whether or not verbs raise to IP. Compare the sentences below:

(13)  
   a. *John likes 
   (English)  
       not Mary.  
   b. Jean (n’) aime pas Marie  
       (French)  

(14)  
   a. *John kisses 
   (English)  
       often Mary.  
   b. Jean embrasse souvent Marie.  
       (French)  

   English lexical verbs do not move to I; that is why sentences like (13a) and (14a) are ungrammatical. Negative clauses like (13a-b) are assumed to contain a maximal projection NegP located between AgrP and TP. Because the verb in (13a) does not move to TP or AgrP, this must be placed after the negation. However, because French verbs move to the AgrP via TP, in (13b) the verb aime ends up in pre negation position, which is before pas. Similarly, this occurs with an adverb such as often. English verbs stay in situ; therefore, it is not possible for adverbs like often to follow the verb, like in (14a). On the other hand, since French verbs do move, they can occur in pre adverbial position as shown in (14b).
Pollock’s analysis of the clause structure was later adopted by the Minimalist Program (Chomsky 1995). I will briefly discuss some of the assumptions held by the Minimalist Program (MP) with regard to verb movements since a detailed description of the theory is not necessary for further discussion. According to the Checking Theory, which is a notion developed under the MP, lexical categories such as V come from the lexicon fully inflected and verbs do not need to move in the clause structure for the affix to be attached. The Checking Theory assumes that the information contained in V is not simply a form of an affix that attaches to the verb stem but rather a bundle of abstract features (e.g. PAST, 3rd ps.) that needs to be checked in the functional nodes of AgrP and TP through movement. After these features are checked, they are deleted. As in Pollock’s proposal, the MP distinguishes between languages with a [+strong] Agr and those with a [-strong] Agr. Languages with a [+strong] Agr, require verbs to move from the lexical category V to the functional category Agr. In these types of languages, this process occurs before the Spell-out, thus features are checked in the overt syntax. However, in English, overt verb movement is restricted to the auxiliary verbs be and have. For lexical verbs, on the other hand, the Checking Theory applies and the verb does not raise to I to check its features until LF. Checking movement in lexical verbs waits (Procrastinate) until after the Spell-out, thus, features are checked in the covert syntax.

I have described the two main approaches that have analyzed the syntactic process by which verbs get Agr and T features. Although there are differences between Pollock’s analysis and the analysis of the MP, both approaches distinguish between languages with [+ strong] Agr and those with [- strong] Agr. In the next section I will describe in detail verb movement in both
Spanish and English. As will follow from the discussion, according to verb movement, these two languages are different.

2.4.1 Spanish Verb Movement. It is generally accepted that Romance languages have [+strong] agreement. Although it is not always the case, languages that select the [+strong] feature tend to have rich verb morphology and are usually classified as verb-raising languages. Typical of the Romance languages, Spanish does have rich morphology and all verbs raise from V to I to have their features checked (e.g. Agr and T features). In a sentence like *Maria leyó el diario* ‘Maria read the newspaper’, the verb in the VP, *leyó*, raises to I to have its features (present tense, 3rd person singular) checked, as shown in structure in (15):

(15)

Contrary to what one might expect of a verb-raising language, Spanish verbs occur to the right of the negation as shown in (16). Lexical verbs in Spanish follow the negation particle *no* rather than precede it as is the case in French.

(16) a. Marta no leyó el periódico
    ‘Marta does not read the newspaper’
b. *Marta leyó no el periódico

However, the lack of movement in Spanish is only apparent. Despite what the surface structure of the sentence in (16) might suggest, in Spanish, negation is assumed to be a functional head that governs IP (Contreras, 1991) unlike French where NegP is placed within IP between AgrP and TP. That is, in Spanish, verbs do raise, but Neg is in the highest projection that dominates IP. Note that if we want to derive a pre-verbal subject sentence like in (16a), the subject is required to move to the Specifier IP, which is lower than NegP. Movement of the subject to this position would result in an ungrammatical sentence: No Marta lee el diario. A solution to this problem comes from the Split-INFL hypothesis and from Belletti’s (1990) analysis. The Split-INFL analyzes the Agr and T features in IP as separate heads. According to Belletti, negative particles like no are clitics. As a clitic, no must move to Agr. Therefore, the structure of (16a) is shown in (17).

(17)
As for adverb placement in Spanish, the position of the adverb is not fixed. Rather, its placement is related to the specific type of adverb. Spanish adverbs can occur in different positions with respect to the verb. Some may occur in post-verbal position, as shown in (18). This pattern is expected and is similar to the one observed in other verb-raising languages, namely French (see example in 14b).

(18)  a. La niña quiere mucho a su perro.
The girl loves much her dog
b. *La niña mucho ama a su perro.

c. María leyó frecuentemente el diario. (Zagona, 2002)
María read carefully the paper
d. *María frecuentemente leyó el diario.

However, Spanish adverbs may also precede the verb (19) position, which is more characteristic of non-verb raising languages like English.

(19)  a. Probablemente Juan se equivocó.
Probably, John made a mistake
b. Juan probablemente se equivocó.

Although the example in (19b) seems to indicate that no verb movement occurs, it is generally assumed that verbs do move in these types of structures. Following the analysis in Belleti (1990) for Italian adverbs, pre-verbal adverbs may not be interpreted as a function of verb movement but rather of topicalization of the subject. It is assumed that in Romance languages, all verbs need to raise. Thus, if the relevant order were a function of the verb, as the surface structure might suggest, we would expect the Spanish word order to pattern with French
rather than with English. To explain the placement of evidential adverbs like *probablemente* ‘probably’, Belleti, (1990) and Cinque (1999) propose that these adverbs need to be treated as higher sentence adverbs. As such, these adverbs are generated in a position at the very beginning of the sentence and may be adjoined to AgrP. Cinque (1999) mentions that these are focusing adverbs and, as such, they are licensed to occur in different positions within the sentences and can also have different scopes. They may appear to the left of the highest functional projection of the clause over which they have scope (19a) or they can also appear after the subject as in (19b).

In the former case, it is assumed that the subject of the sentence is topicalized and fills an initial position in the sentence (e.g. TopP).

In sum, although in Spanish, the word order may be similar to the one observed in a non-raising language, namely English, such similarities are only apparent. Spanish syntax and its verb movement closer resemble the patterns observed in other verb-raising languages, such as Italian.

### 2.4.2 English Verb Movement

In earlier analyses, English lexical verbs were assumed to get agreement by a syntactic process commonly known as affix lowering. Initially, the actual affix was assumed to move from I to VP where it was attached to the stem of the verb. However, in more recent approaches, verbs are assumed to be fully inflected. In particular, the Checking Theory assumes that verbs are derived as fully inflected words. The grammatical information once thought to be held in the inflection is now assumed to be a bundle of abstract features. Features must contribute to interpretation and for this to happen, they must be checked. In order for features to be checked the lexical head (e.g. VP) needs to be adjoined to the relevant functional head (e.g. AgrP). Under this approach, English lexical verbs are fully inflected words that remain in their base position on VP and no lowering movement occurs. But how, then, do
verbs check their features? The Checking Theory assumes that in all languages verbs raise to have their features checked, but that the timing of the checking differs between languages. English has a weak Agr feature, therefore, lexical verbs will not have their features checked before the Spell-out and are left unchecked in the S-structure. Instead, verb movement is delayed by procrastination and features are not checked until LF.

Movement restrictions of lexical verbs are more clearly seen in the surface structure of negative sentences. The English particle *not always appears to the left of the verb as in the example (20).

(20)  a. John does not buy the book.

b. *John buys not the book.

Sentence (20a) is grammatical because lexical verbs do not undergo verb movement in the S-structure. Instead, lexical verbs must appear to the right of *not and negation is formed by placing the form *do (i.e. Do-support) in a place that an auxiliary would otherwise be. See example (21a). In negative sentences with lexical verbs, the category NegP, which is associated with the negative marker *not, blocks the movement of features and requires Do-support. In such sentences, it is assumed that *do is inserted under T and then moves to Agr. In contrast, English auxiliaries do undergo verb movement before Spell-out and, as such, they are obligatorily placed in pre-negation position. If an auxiliary fails to move and if we assume that Do support analysis is correct, then an ungrammatical sentence like (21b) would result.

(21)  a. John has not bought a book.

b. *John does not have bought a book.
Adverb placement also offers evidence of verb movement. In English, adverbs like often appear to the left of the verb as in the sentence in (22a). They are restricted to this position and cannot be placed after the verb.

(22)  
a. Marta often reads the newspaper.

b. *Marta reads often the newspaper.

In example (22a) above, no verb-movement occurs. The verb reads is a lexical verb and, as expected, it appears to the right of the adverb. If movement takes place and the verb is moved to a higher position, then this will appear to the left of the adverb yielding an ungrammatical sentence such as (22b). Thus the pattern observed in sentences with adverbs is parallel to that observed for negation placement. None of these forms can be preceded by the verb of the sentence.

In sum, English can be classified as a non-verb raising language in the sense that overt verb movement is limited to auxiliaries. In this language, auxiliaries undergo verb movement, but lexical verbs must remain in the position in which they were generated in the S-structure, which is in the VP. English verb movement restriction has consequences in the syntactic structure. In English, adverbs and negation appear in preverbal position. Both adverbs and the negation particle not are placed in a higher position than VP.

2.5 Spanish and English Verb Agreement: Cross-Linguistic Differences

We can conclude from the above discussion that subject-verb agreement in English and Spanish works differently both in the morphological and syntactical domains. First, Spanish is a highly inflected language whereas English is characterized by a low number of verbal inflections. Except for the 3rd person singular, which only carries the thematic vowel of the verb,
all Spanish verbs are inflected for person, number and tense. In English, only the 3rd person singular of the present tense is inflected and marked for agreement. Moreover, in both languages verbs acquire agreement by different syntactic processes. According to Pollock’s analysis, languages are divided into two categories: [+strong] AGR and [-strong] AGR. Following this analysis, linguists treat Spanish and English as typologically distinct. Spanish is typically treated as a [+strong] Agr language. In this language verbs are required to raise to I to get Agr features and movement is assumed to occur before the Spell-out (i.e. in the overt syntax). English, on the other hand, is classified as having [-strong] Agr and, as a consequence, verb movement is not expected to occur with all verbs or at least not in the same manner in this language. English lexical verbs are assumed to raise until after the Spell-out (i.e. in the covert syntax). Hence, verb movement timing in Spanish differs from that of English. Movement restrictions in these languages account for their syntactical differences. For instance, the English category Neg is assumed to appear to the left of the VP head whereas in Spanish Neg appears in a higher projection that dominates the IP.

2.6 Spanish and English Prosodic Structure

English and Spanish not only differ in their morphological and syntactic structure but it has been suggested that they also differ in the verbal prosodic structure (Lieberman to appear). As I discussed in Chapter 1, differences in the prosodic structure have been claimed to play a role in learners’ success with the production and comprehension of the verbal morphology of the target language. In what follows, I will briefly describe English and Spanish verbal prosodic structure.

Goad, White and Steele (2003) and Goad and White (2006) proposed that in English the inflections for tense (i.e. past −ed) and number agreement (i.e 3rd person singular −s)
adjuncts to the PWd rather than within it. English, like most languages, accepts maximally binary rhymes (i.e. –VV and/or –VC) (E.g. Harris 1994), but it does not allow word internally three-segment rhymes (e.g. [bai.kər] but *[bai.kər] ‘biker’). A third segment may be included but is limited to word-final position (e.g. [kri:p] ‘creep’, [tækt] ‘tact’). In English, an extra segment is allowed. A fourth segment at the right edge of the word is possible if it is an inflection (e.g. [hɛlps]). This fourth segment (i.e. the inflection) is organized outside the domain of PWd to which it attaches. In contrast to regular verbs, pseudo-inflected verbs such as *kept are always suffixed with –t. Adding suffix –t to the form triggers a stem change (e.g. vowel shortening: keep vs. kept). A similar process occurs in monomophemic forms (e.g. [əd_pt]PWd ‘adept’). This process, however, is not observed in regular verbs. According to Goad and White (2006) and Goad, White and Steele (2003), vowel shortening supplies evidence for a PWd internal analysis (e.g. [kɛp-t]PWd ‘kept’) in both pseudo-inflected verbs and monomophemic forms but a Pwd adjoined analysis for the regular verbs (e.g. [hɛlpt]PWd sPWd).

By contrast, in Spanish, the inflection is organized within the PWd (Alers-Valentín 2000; Nuñez Cedeño & Morales-Font 1999, Lieberman to appear). In other words, in Spanish, the inflection is found inside the stress domain. Therefore, the prosodic structure that underlies verbs in English and Spanish is different. In English, the inflection is adjoined to PWd whereas in Spanish, inflectional morphology is incorporated within the PWd as an internal clitic. See the structures below in (23)
The cross-linguistic differences found between the Spanish and English verbs are summarized in Table 2.4:

Table 2.4

*Properties of Spanish and English verb systems*

<table>
<thead>
<tr>
<th></th>
<th>Spanish</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal morphology</td>
<td>Highly inflected</td>
<td>Poorly inflected</td>
</tr>
<tr>
<td>Verb raising status</td>
<td>Verb raising</td>
<td>Non-verb raising</td>
</tr>
<tr>
<td>Prosodic structure</td>
<td>Internal clitic</td>
<td>Affixal clitic</td>
</tr>
</tbody>
</table>
2.7 Conclusion

As can be concluded from above, English and Spanish are typologically distinct languages. They differ in the richness of their verbal morphological system, their syntactic structure, and their prosodic structure. The question is whether learners show similar patterns of acquisition regardless of cross-linguistic differences or if, instead, there are differences across learners. In the next chapter (i.e. Chapter 3), the literature on verbal morphology acquisition in L2 (and L1 learners) is revised. Thus far, the research seems to indicate that there might be some differences between learners acquiring typologically distinct languages. However, most studies on verbal morphology acquisition in child L2 learners have been done with children learning English as L2. Therefore, from the existing literature at the present, it is not possible to draw a conclusion about whether or not the process of verbal morphology acquisition is similar to all child L2 learners.
CHAPTER 3
VERB MORPHOLOGY ACQUISITION IN L1 AND L2 LEARNERS

The acquisition of verb morphology has been found to be problematic for L1 learners and L2 learners (Geçkin & Haznedar 2008; Haznedar & Schwartz 1997; Ionin & Wexler 2002; Lardiere 1998; Lakshmanan 1994; Paradis, Rice, Crago & Marquis 2008; Prevóst 1997; Radford 1990; Rizzi 1993/94; Wexler 1994; White 2003). In particular, verb bound morphemes are found to be more difficult than free morphemes for all types of learners. For instance, learners are likely to omit verb agreement inflections in production. Researchers have related these difficulties to the access learners have to functional features, such as Agr and T.

In this regard, there are two main theoretical approaches to this issue. On the one hand, there are those who maintain that functional features are impaired in the learner’s grammar and, as consequence, they cannot perform in a target-like manner (Eubank 1993/1994, Eubank & Grace 1996; Hawkins & Chan 1997; Meisel 1997; Vainikka & Young-Scholten 1994). On the other, there are those who propose that learners’ grammar is not impaired but that processing problems (Haznedar & Schwartz 1997; Haznedar 2001; 2003; Lardiere 1998; Prévost & White, 2000) or phonological problems (Goad, White, and Steele 2003; Goad and White 2006) diminish the learner’s ability to perform in a target-like manner. Another question that researchers have examined is how closely the development observed in child L2 learners resembles that observed in L1 learners and in adult L2 learners. So far, it has been found that the patterns observed in child L2 learners do not mirror those of L1 learners. In addition, it has been found that although similar, child L2 learners do not completely resemble adult L2 learners either. These findings suggest that child L2 learners show a distinct pattern of acquisition, but more research is still
needed to describe in detail the acquisitional patterns followed by this group of learners. In particular, there is little research on Spanish acquisition. Having information about morphology acquisition in languages other than English would allow us to have a more comprehensive view of the process of acquisition in child L2 learners. In what follows, I discuss the acquisition of Spanish and English verb paradigms by both child L2 learners and L1 learners and briefly compare child and adult L2 acquisition.

3.1 English L1 Verb Morphology Acquisition

3.1.1 Production English-speaking children start producing tense and agreement morphemes early on; at about the age of 2, these morphemes may already be present in the child’s speech. However, although these morphemes appear at a relatively early stage, children do not use them in a productive way until much later (Brown, 1973; de Villiers & de Villiers, 1973). As expected in L1 acquisition, they first go through a root infinitive stage. In this stage, which lasts a long period of time, verb errors are extremely frequent and variation between finite and non-finite forms predominates in the child’s speech until around the ages of 3 to 5. It is important to note that in English, children’s root infinitives appear as bare stem forms, thus, children’s verbal errors are only evident in certain verbal forms: 3rd person singular –s, past –ed, copular and auxiliary verb forms of be and do.

The first studies on morpheme acquisition by English-speaking children were carried out by Brown (1973) and de Villiers and de Villiers (1973). Both studies looked at the acquisition of 14 grammatical morphemes. They included all the verbal morphemes mentioned above (i.e. 3rd person singular –s, past –ed, copular and auxiliary be and do) as well as other non-verbal morphemes (articles a and the, plural –s, etc.). Brown’s longitudinal study analyzed the
developmental patterns followed by three monolingual English-speaking children (Adam, Eve and Sarah). This study established the criterion that a morpheme is mastered when it reaches 90% of correct use in obligatory contexts. This criterion of acquisition is still used in L1 current studies. De Villiers and de Villiers (1973), on the other hand, did a cross-sectional study that analyzed production data of 21 monolingual English-speaking children ages 1;4 to 3;4. Both studies (i.e. Brown (1973) & De Villiers and de Villiers (1973)) reported similar results and their main findings could be summarized as follows: 1) the order of acquisition of verb morphemes is practically invariant among children. They first acquire the *ing* form; this morpheme is followed by irregular past, regular past –*ed*, 3rd person singular –*s*, and finally auxiliary and copula verbs. 2) Most verbal morphemes are acquired later than non-verbal morphemes (e.g. plural –*s*). 3) From the 14 morphemes that were analyzed, auxiliary and copula verbs were the latest morphemes to be mastered by the children. The rationale for why children follow such a pattern of acquisition has been related to the semantic and grammatical complexity of the morphemes in question. For example, a morpheme’s grammatical complexity was determined according to the morpheme’s transformational complexity (i.e. the number of grammatical transformations involved in the derivation of the morpheme). Following Jacobs and Rosenbaum’s (1968) study, de Villiers and de Villiers ranked morphemes from those with the least number of transformations to those with the greatest number of transformations. A correlation was found between morpheme complexity and order of acquisition. Less complex morphemes were acquired before more complex ones. Semantic complexity, on the other hand, was determined according to the dimensions of meaning of the morphemes found in early child speech (i.e. the number of the morpheme’s meanings controlled by the child). A correlation between morpheme
semantic complexity and order of acquisition was also found (see de Villiers & de Villiers for a
detailed discussion).

In a later study that included a larger number of participants (Lahey, Liebergott, Chesnick
et al 1992), the finding in (1) above reported in Brown and de Villiers and de Villiers was
challenged. This study found that children show variation in the age at which certain morphemes
were acquired. In other words, not all children show the same order of morpheme acquisition.
However, the authors warned that, “the large variability in our data may have been related to the
small samples” (p. 388). Despite the authors’ warnings, the study included a considerable
number of children (42 children). Therefore, it is not clear whether variability could be linked to
the number of participants. Although there is some disagreement, studies on L1 English
morpheme acquisition have commonly assumed that the order of acquisition is similar across
English-speaking children.

Another interesting finding reported in the literature on English L1 acquisition is related
to the type of errors. Children seem to be consistent in the type of errors they make. They tend to
produce errors of omission (e.g. she work) rather than errors of commission (e.g., I works).
Therefore, errors found in the data are mainly cases where the child fails to realize the
morpheme, whereas cases in which the child produces the incorrect morpheme are practically
nonexistent. The proportion of omission in English L1 learners starts to decline by the age of 3,
but it is not until around the age of 5 that the use of infinitive markers becomes consistent in the
child’s speech (Rice, Wexler & Hershberger 1996). Moreover, when the acquisition of verb
affixes, such as 3rd person singular –s is compared to the acquisition of free-standing verb
morphemes, like auxiliary be, the data show that both types of morphemes grow together over
time. At the beginning, growth is slow, then it rapidly accelerates before the final period in which growth levels off. This acquisition pattern is similar across children and morphemes.

3.1.2 Comprehension. I will turn now to children’s comprehension of verb morphemes. The literature is very limited in this respect; and to the best of my knowledge, there is only one study that has analyzed comprehension of verbal morphemes in English-speaking children. The study by Johnson, de Villiers and Seymour (2005) evaluates comprehension of agreement inflection. With the aim of testing children’s morphological knowledge, these authors evaluated whether children were able to comprehend the 3rd person singular –s as a number agreement marker. To this end, they tested 62 European-American children whose ages ranged from 3 to 6 years old. A picture-choice comprehension task was administered to all children and pictures were presented in pairs. One picture had a single subject and the other had two or more subjects performing the same action. They used stimuli that were designed to mask plurality on the noun by using verbs that began with s, as in (24). This was done to ensure that the only cue children had to identify the number in the sentence’s subject was the verb ending.

(24)   a. The duck swims on the pond.

   b. The ducks swim on the pond.

The results revealed that English-speaking children can produce verb morphemes before they are able to comprehend them. Children start producing verb inflections around the age of 2;5, but according to this study, children do not use them in comprehension until around the age of 5. Researchers found that 5 and 6-year-old children comprehended the 3rd person singular -s ending as a marker of singularity, but 3 and 4-year-old children performed no better than chance at detecting the linguistic information the marker carried. The authors also measured children’s
sensitivity to agreement morphology and reported that only the 5 and 6-year-old children showed significant sensitivity to the presence of the 3rd person singular affix. However, although 5 and 6-year-old children comprehended the marker and showed sensitivity to it, their overall accuracy was not at ceiling. For instance, for the 6-year-old children, the mean percentage for singular sentences was 78.89% and for plural sentences was 53.33%. It can also be noted from these results that children did better with the singular form, which in English is the verb form that carries a morphological marker.

Johnson, de Villiers, and Seymour (2005) proposed two possible explanations for their findings, both related in some way to the child’s metalinguistic knowledge. First, they suggested that sentences like the ones included in the study prevent the child from accessing the Agr feature in comprehension. In a regular sentence, the number in the NP triggers agreement with the verb inflection, thus facilitating agreement comprehension. However, when plurality in the NP is disguised, the child can only rely on the verb, and comprehension of agreement becomes problematic for him. Johnson, de Villiers, and Seymour argued that in order for children to be successful in this kind of task, they would need to use their metalinguistic knowledge and they are not able to start doing this until they are 5 or 6 years old.

The second explanation is based on the Minimalist model (Chomsky 1995) and it relates the interpretation of the verb inflection to its contribution to LF computation. According to this model, the verb needs to move to the IP to have its features checked. Once features are checked, only those that contribute to the meaning of the Logic Form (LF) will not be deleted. It is generally assumed that the features of the subject of the sentence are what contribute to LF interpretation. The features of the verb, on the other hand, are considered to be redundant;
therefore, they will be deleted once they are checked. Due to the fact that the verb features are deleted and that the features of the subject are obscure, Johnson, de Villiers and Seymour maintained that the only way a child can process the sentence is by using other non-linguistic cues or by metalinguistic inference.

In sum, children acquiring English as their L1 have difficulties with verbal morphemes in both production and comprehension. Verbal inflections are not produced in a target-like manner until the child reaches preschool years. It takes them a relatively long time to set out the correct verbal forms in their speech. Moreover, the available evidence indicates that children cannot access the grammatical meaning of the verbal inflection until they are 5 or 6 years old, the age at which children’s production is practically target-like. Hence, there seems to be an asymmetry between children’s performance in production and comprehension.

3.2 Spanish L1 Verb Morphology Acquisition

3.2.1 Production. Children who are acquiring Spanish as L1 start producing verbal inflections early on and around age 1;6 they produce inflected verb forms (Liceras, Valenzuela & Diaz 1999). For example, by this age they are highly accurate with person agreement inflections. Moreover, it has been found that Spanish-speaking children rarely drop verbal morphemes. However, it is interesting to note that Spanish is a highly inflected language and verbs do not occur without some type of inflectional morphology. All verbs, even if they are in the infinitive form, require a morpheme (e.g. ar, er, ir). Therefore, root infinitive forms produced by Spanish-speaking children, as opposed to English-speaking children, are actual infinitives with their own morphology. Compare the Spanish infinite form with the English bare form in (25):
In Spanish L1 acquisition, the root infinitive stage is short-lived. In fact, some have even questioned the existence of a root infinitive stage in this language (Duran, 2000; Guasti 1994). However, although rare, evidence of root infinitives in Spanish-speaking children has been reported in the literature. Liceras, Valenzuela and Díaz (1999) analyzed longitudinal data of two Spanish-speaking children and reported the use of infinitive forms by both of the children (26). Nevertheless, the authors of this study do recognize that root infinitive forms are infrequent and occur exclusively in the child’s early language, most often between ages 1;7 and 1;9.

(26) a. Este tapar (María, 1;7)  
    this one cover-INF

    a. El otro buscar (María, 1;8)  
    the other look for-INF

Although Spanish-speaking children stop using infinitive forms quite early, they continue to make verb inflectional errors until shortly after the age of 2, when errors in number and tense morphology persist. Spanish-speaking children do not acquire all the verb morphology at the same time; instead, it has been observed that the child acquires person agreement morphology early on but does not begin to use number and tense productively until a later stage (Grinstead 2000). For instance, children tend to use the 3rd person singular verbs instead of 3rd person plural (27).
(27) a. se cayó  (when pointing two or more objects)
   it fell-PAST-3RDSG
   ‘it fell’

It has been suggested by Ezeizabarrena (1997) and Tsimpi (1992) that because 3rd person singular lacks functional content, children treat this verbal form as a root infinitive. In a similar line, Grinstead (1998) suggests that in Spanish speaking children, 3rd person singular is a default form that can be taken as the equivalent of root infinitives in languages like English.

Overall, children seem to be unable to produce plural forms at an early language stage. Children who are learning Spanish initially produce singular verb forms and produce plural verb forms later on (Montrul 2004; Perales, Liceras & Bel 2006). This phenomenon has been named the Avoid Plural Phenomenon by Hoekstra & Hyams (1995), and it has also been reported in French (Ferdinand 1996), German (Clahsen et al. 1994) and Catalan (Grinstead 1994).

3.2.2 Comprehension. Like English-speaking children, Spanish-speaking children have been found to be able to produce verb inflections before they are able to comprehend these forms. Perez-Leroux (2005) replicated the study done in Johnson, de Villiers & Seymour (2005) with Spanish-speaking children. The study tested whether their performance was similar to the one reported for English-speaking children. In particular, the study aimed to investigate whether the developmental number problem reported in English persisted in a highly inflected language like Spanish. For this purpose, 23 children between the ages of 3;2 and 6;6 were tested, all learners of Dominican Spanish. Perez-Leroux analyzed whether the children were able to use the verb inflection (i.e. 3rd person plural –n) to interpret the number of the noun phrase. In the study null-subject sentences, like in (28), were used to mask the nominal expression of number. In these sentences number was solely expressed on the verb inflection.
The results obtained in this study parallel those of Johnson et al. Overall, Spanish-speaking children showed poor levels of accuracy in the experiment, never reaching an accuracy of more than 70%. For example, the older group of children (4;8-6;6) performed at 50% correct in the singular sentences and at 67% correct in the plural ones. This was so despite the fact that Spanish has a more robust verb agreement system than English. Additionally, she found that similar to the children in Johnson et al., the Spanish–speaking children tested for the study were not able to use the verb ending as a number marker until around the age of 5 years old. As for the younger group of children, ages 3;2-4;5, they were not able to discriminate the singular form from the plural one and did significantly poorer than the older group of children who did discriminate between the two forms. Another parallelism with Johnson et al. was that children did better with the marked verbal form. Spanish-speaking children were more successful with the plural context, which is the marked form in Spanish, than with the singular context. From the findings, Perez-Leroux concluded that “acquiring a language with a uniform verb paradigm does not improve number marking in comprehension for children” (2005: 10). In other words, regardless of the L1, there may be a stage in which children have the ability to use inflections in production but not in comprehension. Perez-Leroux proposes that children’s deficiencies in comprehension may be related to the syntactic/semantic interface. According to the author, children have full understanding of the morphology and syntax of number marking, but the semantics of number agreement is not yet fully mastered. More specifically, Perez-Leroux
maintains that children’s difficulties with number derive from their incomplete knowledge of “where the number is interpretable in the language” (p. 10).

3.2.3 Conclusion. In summary, we can assert that Spanish-speaking children start producing verb inflections at a very early age. Indeed, inflected verbal forms become productive in these children at an earlier age than in English-speaking children. Moreover, root infinitives in Spanish-speaking children are highly infrequent and found only in the child’s first verbs. However, although verb inflections seem not to be highly problematic to L1 Spanish acquirers, they do have difficulties producing plural verb forms, and these forms are acquired later than the singular forms.

In comprehension, Spanish-speaking children’s performance resembles that of English-speaking children. Both groups of children seem to be more successful in production than in comprehension. These findings suggest that children are able to produce agreement inflections, but that they are not equally successful at interpreting the grammatical information carried by the inflections. Johnson et al. attributes children’s difficulties to a lack of sufficient metalinguistic knowledge to access the grammatical information of the verb inflection when clues on NP are obscured. Perez-Leroux, on the other hand, relates children’s performance to the syntactic/semantic interface and claims that children have morphosyntactic knowledge, but that they must have an incomplete semantic understanding of number. Therefore, children fail to discriminate between the plural and singular form. Nevertheless, Brandt-Kobele and Höhle (2010) conducted a similar study with German-speaking children and their findings suggest otherwise.
In this study, two experiments were performed to test whether German-speaking children aged 3 to 4 showed comprehension of verb inflection. In the first experiment, they used the preferential looking paradigm methodological approach. In this type of method, the child’s eye gaze movement is observed while they look at some pictures and listen to a stimulus. The child’s gaze patterns give us information about the child’s grammatical comprehension.

Results from this experiment revealed that children of 3 to 4 years of age comprehended verbal inflection. The authors argue that in contrast to the picture matching task (used in previous studies), the methodology they used “puts only low demands on children” (p. 1918). In Experiment 2, children had to perform a picture selection task while their eye gaze was tracked. The results from this experiment were similar to the ones reported in Johnson et al. (2005) and Perez-Leroux (2005). That is, children seemed to not process the inflection and could not accurately infer the number of the subject of the sentence. Brandt-Kobele and Höhle concluded that children can comprehend verb inflection, but “that processing factors must account for children’s failure to use this knowledge in the pointing task” (p. 1922). If findings in Brandt-Kobele and Höhle are correct, then the conclusions drawn in Johnson, de Villiers and Seymour and by Perez-Leroux need to be revised. Children in Brandt-Kobele and Höhle seem to have complete semantic knowledge of number and they do seem to have access to this knowledge. However, it appears that they are not capable of accurately retrieving this knowledge in tasks that ask them to explicitly and consciously identify the number of the sentence’s subject, for instance in a picture matching task. Although more research on the matter is needed, a possible explanation of children’s performance in comprehension could be related to the child’s metalinguistic knowledge. In Johnson et al., children’s performance is related to their
metalinguistic knowledge, but the authors attribute the results to a lack of access to the relevant grammatical information. They did not consider the possibility that very young children may have access to the grammatical information but may not have enough metalinguistic knowledge or that the cognitive demands imposed by the task were too high for them to process the information and point to the appropriate picture according to the sentence they heard. In a less demanding task (e.g. preferential looking paradigm), children who may not yet have sufficient metalinguistic knowledge may be able to listen to a sentence and access the information carried by the marker. In fact, it has been found that for children to show productive metalinguistic skills, they first need to reach a certain age. Young children do have some metalinguistic skills and it is possible for them to carry out metalinguistic operations, but it is unlikely that they would be able to supply judgments in the same way that an older child or an adult would be able to (Tunmer & Herriman 1984).

3.2.3.1 Metalinguistic Knowledge. At this point in the discussion, it would be useful to formally define the concept of metalinguistic knowledge. In Tunmer and Herriman (1984), metalinguistic knowledge is defined as “the ability to reflect upon and manipulate the structural features of spoken language, treating language itself as an object of thought, as opposed to simply using the language system to comprehend and produce sentences” (p. 12). It is commonly assumed that when a speaker treats the language as an object in itself, he or she needs to shift his or her attention from the meaning of the message to its form (Edwards & Kirkpatrick 1999). This ability is claimed to be a controlled activity, in which the child must deliberately distance him or herself from the language in order to reflect on it (Hakes 1980). Unlike other linguistic operations that are generally carried out automatically, namely language production,
metalinguistic operations require a great deal of attention from the speaker and rely upon whether the speaker chooses to engage in such an activity (Tunmer & Herriman 1984). An activity that requires the use of metalinguistic skills may place more demands on a child than on an adult. Attentional abilities are found to be more limited in children than in adults; for instance, children have been shown to have a shorter attention span than adults (Levy 1980; Betts, Mckay, Maruff & Anderson 2006). Therefore, it may be more challenging for children to be attentive to the form of a sentence rather than just its meaning than it would be for an adult.

While at around the age of 4 the child’s grammatical knowledge may resemble that of an adult, language acquisition in children may not occur in parallel with the development of their metalinguistic knowledge. For instance, children may have acquired the grammar of the L1, but they might not be able to reflect upon the structure of the language to resolve linguistic ambiguities or judge grammaticality. Although children may show signs of metalinguistic knowledge at around the age of 2;5 (Clark 1978), young children tend to only attend to the semantic content of an utterance and have difficulties teasing apart the meaning of an utterance from its form (Edwards Kirkpatrick 1999; Gleitman, Gleitman & Shipley 1972 Hakes 1980; Sack & Beilin 1971). Before middle childhood (i.e. ages 7 -12), children tend to judge sentences on the basis of what the sentence asserts rather than by whether or not the structure used by the speaker was well-formed (Hakes 1980). The development of the child’s metalinguistic knowledge occurs gradually. Evidence reported by several researchers suggests that children start using their metalinguistic knowledge in a consistent and productive way by the ages of 7 or 8 (Edwards & Kirkpatrick 1999; Ferreira & Morrison 1994; Gleitman, Gleitman & Shipley 1972; Hakes 1980; Tunmer & Herriman 1984). Surprisingly, this age was also characterized by Piaget
as a turning point in the child’s cognitive development (Piaget 1957). At the age of 7, the child moves from the preoperational stage (2 to 7 years old), which is characterized by egocentric thinking, to the concrete stage (7-11 years old). According to Piaget, around the age of 7 the child is mature enough to use logical thought and begins to develop decontextualized thinking. For example, children at this stage start making judgments about number and space and they understand that something remains the same quantity, regardless of whether its appearance changes.

Before the age of 7 a child’s metalinguistic skills are not very productive. For instance, it has been found that children younger than 4 years old cannot attend to the content of a story while they make decisions about its form (Edwards & Kirkpatrick 1999). They are not able to reflect upon the structure of the sentence and its meaning at the same time. Likewise, although 4- and 5-year old children show a higher degree of metalinguistic knowledge, they are not highly successful in such tasks either (Edwards & Kirkpatrick 1999; Gleitman, Gleitman & Shipley 1972). The ability to attend simultaneously to both the semantic content of a message and certain aspects of its form improves gradually over time. Predicting the consequence of using one particular form (e.g. inflection) over another and identifying and reflecting on specific linguistic units are skills that seem to emerge rather late in a child’s linguistic knowledge (Clark 1978). Improvement of these abilities becomes evident at around the ages of 7 or 8. For instance, both syntactic and phonological awareness excel at age 7 (Edwards & Kirkpatrick 1999; de Villiers & de Villiers 1972; Ferreira & Morrison 1994, Gleitman, Gleitman & Shipley 1972; Liberman, Shankweiler, Fowler & Fisher 1974). Metalinguistic skills continue developing until adulthood, when it reaches its highest level (Edwards & Kirkpatrick 1999). It is also important to note that
metalinguistic knowledge, unlike other linguistic domains (e.g. syntactic knowledge), can vary extensively across speakers. This variation in metalinguistic awareness has been found in both adults and children. Speakers who are engaged in the same linguistic task can have different levels of metalinguistic knowledge. Some speakers can show a high level of metalinguistic knowledge, whereas others may show a lower level while doing the same task.

If we consider the child’s metalinguistic development described above, then the results obtained in Johnson et al. (2005) and Perez-Leroux (2005) are not that surprising. Older children, from the ages of 5 to 6 were able to do the task, because they had developed metalinguistic skills that the younger group, ages 3 to 4, had not yet developed. We would then expect that children would gradually do better in this sort of task. That is, the older the child, the better he or she will do. However, we should also expect variation between learners within the same age group. The metalinguistic knowledge observed in one child may not be the same as that observed in another child, even if they are the same age and are doing the same task. Instead, it can vary greatly from one child to the other. This variation in knowledge was observed in the children who participated in Johnson et al (2005). Although, the researchers do not discuss individual results, the group results show relatively high standard deviation values even for the older children (e.g. 27.84 for singular, 34.30 for plural).

If performance in comprehension tasks, such as those included in the studies, is related to the children’s metalinguistic skills, then it is interesting to see how the child’s inability to analyze the structure of the sentence onto specific linguistic units hinders his capacity to identify the grammatical meaning of a sentence when it has been obscured. This would suggest that children are able to produce verb inflections in a productive and constant way, but they are not
able to analyze and reflect upon their grammatical meaning until a certain age. Neither Johnson et al (2005) nor Perez-Leroux (2005) included children older than 6 years old. Therefore, we do not know whether older children would have had performed better on the tasks. The data provided by children older than 6 may offer some insights into the relation between the child’s metalinguistic development and his performance in comprehension.

In this section, verb morphology acquisition in L1 English and L1 Spanish acquisition has been discussed and children’s performance in production and comprehension has been described. According to the data, verbal morphemes are not as problematic for Spanish learning children as they are for English speaking children who produce root infinitives more frequently. These difficulties, however, are not exclusive to L1 learners, but rather, as is discussed in the coming section, also apply to second language learners who exhibit difficulties with verb morphemes.

In what follows, I describe verb morphology acquisition in L2 learners of English and Spanish. Although the discussion is mainly focused on child L2 acquisition, adult L2 acquisition is also brought into the discussion to compare both types of L2 acquisition. A description of how these learners do in production as well as in comprehension is included.

3.3 Second Language Verbal Morphology Acquisition

In this section I describe the acquisition of verb morphemes by child L2 learners of English and child L2 learners of Spanish. Both verb morpheme production and comprehension are described. I also discuss the main theories that have been put forward to explain L2 learners’ verb morphology acquisition.
Verb morphology is problematic for child L2 learners and, like in L1 acquisition, morphological variation has been reported (Geçkin & Haznedar 2008; Haznedar & Schwartz 1997; Haznedar 2001; Ionin & Wexler 2002; Prévost & White 2003; Paradis et al., 2008). Child L2 learners frequently fail to produce verb morphemes when required, thus showing variation between inflected and non-inflected forms. This phenomenon has raised important questions about verb morphology acquisition in child L2 learners. For instance, studies have tried to ascertain whether functional categories, such as tense and agreement are present in child grammar and if and how the morphological variation observed in child L2 acquisition is different from or similar to the one reported in child L1 acquisition.

Similar to L1 acquisition, two views are maintained with regard to the learner’s grammar. One view holds that L2 learners do not have access to the relevant features, therefore their L2 grammar is impaired and, as a consequence, they fail to produce verb inflection in a target-like manner. On the other hand, there are those who argue that L2 learners do have access to the relevant features, but that processing problems prevent them from being target-like. The views on the matter can then be divided into the following approaches: the Impairment approach and the Non-impairment approach (e.g. MSIH and PTH) Although both of these models were initially proposed for adult L2 learners, they have been extended to child L2 learners as well (Haznedar & Schwartz 1997; Haznedar 2001; Ionin & Wexler 2002; Herschensohn, Stevenson and Walmunson 2005).

3.4 English L2 Verbal Morphology Acquisition

3.4.1 Production. Studies on the acquisition of English verbal morphology have reported that verbal morphemes are highly problematic for L2 learners. Learners tend to show high rates
of verb inflection omission and for a prolonged period of time. However, studies have also uncovered that learners’ omission errors are selective and not all verb morphemes seem to be equally problematic for them. Instead, it has been found that bound morphemes (e.g. 3sg. –s and past –ed) are particularly problematic for learners. Unbound morphemes (e.g. Aux and Copula be), on the other hand, tend to be produced accurately and from early stages of acquisition.

Overall, the data reveal that L2 learners of English first acquire the unbound morphemes and later on acquire the bound ones. For instance, Haznedar and Schwartz (1997), who studied a Turkish L1-English L2 boy named Erdem, reported that the child acquired both the copula be and the auxiliary be quite early. Erdem consistently produced sentences with the copula from Sample 8 out of a total of 45 samples. For example, in Sample 11 the rate of suppliance was over 95%. A similar pattern was found for the auxiliary be. In contrast, 3sg –s only emerged later and very gradually. The affix did not appear until Sample 15 and by Sample 41 its suppliance only reached 70%. Past –ed was not produced by the child until Sample 14 and by Sample 45 he accurately produced the affix in 27% of instances.

Similar finding were also reported in Ionin and Wexler (2002). This study tested verb morphology knowledge in a group of 20 Russian L1-English L2 learners. The children’s age ranged from 3;9 to 13;10. They were all living in the USA at the time of the testing. Children’s speech samples were collected through individual conversations about the child’s friends and school or by oral description of picture books. Ionin and Wexler reported that children omitted 78% of the 3sg. –s and 58% of past –ed but omitted only 16% of copula be and 33% of auxiliary be. Geçkin and Haznedar (2008) studied three Turkish-speaking girls learning English as their second language. They were 4;5 years old and had been exposed to English for approximately
six hours daily for a year. Data was gathered three or four times per month over a period of seven
months. The researchers reported that the three children produced copula *be* early on and
correctly supplied the copula in more than 92% of utterances. By contrast, 3sg. *–s* and past *–ed* were not productively supplied in the children’s first samples but were acquired slowly and gradually.

Similarly, Paradis, Rice, Crago and Marquis (2008) evaluated verb morphology
acquisition in 24 child L2 learners of English. These children had a mean age of 5;7 and a mean
of 9.5 months of exposure to English. They had different L1 backgrounds (e.g. Korean,
Mandarin, Spanish, Romanian, Cantonese, Arabic, Japanese, Farsi, Dari, and Ukrainian). The
children’s production of verb morphemes was assessed through a picture-description task.
Paradis *et al.* reported that child L2 learners were less accurate at producing bound morphemes
than child L1 learners with a mean age of 3;0. The L2 group scored significantly lower than the
L1 group on the 3sg. *–s* and past *–ed* morphemes. Nevertheless, child L2 learners and child L1
learners did not show significant differences in the production of unbound morphemes (e.g.
copula *be*, auxiliary *be*, and *do*).

These findings do not support the Impairment approach. If learners’ grammar lacks Agr
and T features, as proposed by this approach, we would expect learners to be unsuccessful with
all types of verbs; this, however, is not the case. Lexical verbs, which are the ones that take
affixes 3sg. *–s* and past *–ed*, must have inherent grammatical characteristics (e.g. bound
morphemes, verb-raising status) that make them more difficult to acquire. If this is so, then
learners will have difficulties with these inflections even if they have the relevant functional
features. This would not, however, contradict the assumptions of the Non-impairment approach.
On one hand, this approach assumes that learners’ knowledge is not impaired, thus providing an explanation as to why learners are successful at producing unbound verbal morphemes; while on the other, it recognizes that learners’ grammatical knowledge can outstrip a learners’ accuracy in production and that learners difficulties with bound morphemes may be evidence that this type of verbal morpheme is more problematic to process than the unbound ones.

Moreover auxiliaries and lexical verbs seem to be treated as syntactically distinct by L2 learners. Haznedar (2001) evaluated the use of *yes-no questions in Erdem (Turkish L1-English L2) and found that the child never inverted lexical verbs in these types of questions (e.g. *makes daddy a cake). Instead, he produced questions in which only auxiliaries and modals and the copula *be were inverted. In this child’s first samples, there were questions that contained no subject-auxiliary inversion but that were produced with the intonation of yes-no questions. However, later on, intonation questions were drastically replaced in favor of the yes-no questions with subject-auxiliary inversion. Moreover, in most cases the intonation questions were pragmatically correct.

The child’s *wh*-questions were also evaluated and two types of errors were found: 1) omission of the auxiliary (e.g. *what you eating) and 2) non inversion of the auxiliary (e.g. *what you’re saying). These two errors have also been observed in child L1 acquisition (Klima & Bellugi, 1996). Despite the occurrence of these errors, Haznedar explains that they did not occur in a systematic way in the child’s speech and most of the time these non-target like questions were found adjacent to a question where the auxiliary was supplied and inverted. Furthermore, even after target-like *wh-* constructions seemed to be productive in the child’s data, 3rd person singular –s and past –ed were still constantly omitted. In sum, these studies provide
robust evidence that functional categories, such as CP or IP, can be acquired in child L2 acquisition and that child L2 learners have knowledge of verbs’ raising status. Hence the data suggests that learners’ non-target like verbal forms may not reflect their “real” syntactic knowledge of the L2.

3.4.2 Comprehension. As for comprehension, studies suggest that learners perform better in comprehension tasks than in production tasks. For instance, Ionin and Wexler (2002) examined L2 speakers’ verbal morphology knowledge through an oral grammaticality judgment task. The participants were 18 Russian L1-English L2 learners. Children’s age ranged from 6;0 to 14; 0 (mean age 10;3). All but one of the children had lived in the USA for two years or less. The remaining child was born in the USA but was not exposed formally to English until age four and reported a time of exposure of three years. In this task, participants had to judge whether or not the verb form was correctly inflected. They were tested in four conditions: 1) correctly inflected items, 2) nonfinite items, 3) wrongly inflected items, and 4) dropped ing items. The task included both thematic and auxiliary forms. The researchers reported that children’s performance in the grammaticality judgment task was better than their performance in the production task.

Similar findings were reported by Paradis et al., (2008). In this study, knowledge of verbal morphology was accessed through a grammatically judgment task very similar to the one used in Ionin and Wexler. Two groups of learners were tested and compared: A group of 24 child L2 learners and a group of 24 children with Specific Language Impairment (SLI). Both groups had a mean age of 5;7. The results revealed that L2 learners were less accurate than the SLI group at producing morphemes. In the grammaticality judgment task, L2 learners performed
as accurately as the SLI group. Thus, child L2 learners were less successful at producing the
verbal inflection than at detecting their omissions as ungrammatical. Taken together, these
findings suggest a dissociation between L2 children’s production of verbal morphemes and their
knowledge of these morphemes. That is, learners’ underlying knowledge seems to surpass their
productive abilities.

3.4.3 English L2 Verbal Morphology Acquisition in Adults. In this section, since it is
out of the scope of this dissertation, I will not discuss in detail L2 adult acquisition but will offer
a brief description and discuss how it is similar or different from child L2 acquisition. Both adult
and child L2 learners of English have difficulties producing verb inflections and tend to drop
these morphemes in production (Ladriere 1998; White 2003; Zolb & Liceras 1994). However,
child L2 learners are eventually more successful than adults and reach higher levels of
performance. Lakshmanan (2004) claims that after a relatively short period of time of intense
exposure to English, most L2 children should master or should be close to mastering English
verb morphemes. Most adults, on the other hand, show persistent difficulties and fail to produce
the verb inflection after being exposed to English for a long period of time (Ladriere 1998;
Johnson and Newport 1989; Dekeyser 2000). Nevertheless, there are adults who are able to reach
high rates of inflection supply (White 2003). Both child L2 learners and adult L2 learners are
better at supplying unbound morphemes than at supplying bound ones, although sensitivity to
bound inflections in children has been proposed to be greater than in adult L2 learners (Newport
1994, Zobl and Liceras 1994, Vainikka and Young-Scholten 1998). Moreover, unlike L1
acquisition, errors in adult and child L2 learners seem not to be related to the occurrence of
subjects and case errors. In L1 acquisition, omission of verb inflection declines together with
omission of subjects, and both linguistics phenomena have been argued to be related (Jaeggli & Hyams 1988). Also observed in L1 learners is the use of non-nominative pronouns in contexts where a nominative pronoun is required (e.g. me play). Nonetheless, neither of these errors (i.e. subject omission or case errors) is common in child or adult L2 acquisition. Although both child and adult L2 learners may omit the subject, this stage does not last long and the occurrence of subjects seems not to be correlated with omission of the verbal inflections (Davis 1996; Haznedar & Schwartz; Haznedar 2001, Lardiere, 1998). Therefore, this seems to suggest that in this domain, the patterns of acquisition followed by child L2 learners better resembles those of the adult L2 learner rather than those of the child L1 learner. Furthermore, in L1 acquisition, children’s difficulties with verbal morphology seem to be more global and affect both auxiliaries and lexical verbs, whereas in adult and child L2 learners, they seem to be limited to lexical verbs, which are the verbal forms that are formed with a bound morpheme.

3.5 Spanish L2 Verbal Morphology Acquisition

Acquisition of Spanish by child L2 learners has been scarcely studied and little is known about how children learn Spanish as an L2. Most studies have focused on college students who are learning Spanish in a classroom setting. Because studies in child L2 learners of Spanish are so limited, both adult and child L2 Spanish acquisition are described in this section, starting with the description of L2 Spanish acquisition in adults. Since English L2 morphology acquisition was describe in the previous section, I may refer to it as a comparison point for Spanish L2 acquisition.

3.5.1 Production. L2 adult learners of Spanish, like English L2 learners, fail to produce verb morphology inflections and use non-inflected forms (i.e. infinitives) in finite contexts.
However, the rates of non-finite forms by Spanish L2 learners are much lower than in English L2 learners. For instance, in a study conducted by Mezzano (2003), the researcher found that after 24 hours of exposure to Spanish, learners in a beginning level university class produced 96.5% of the verbs in the finite form and only 4.0% of infinitive forms; and in a later recording (after 88 hours of exposure), infinitives reached only 4% of total verb forms produced. In the first recording, learners produced person and agreement inflection in 80% of the verbs. In other words, agreement affixes were infrequently omitted by these learners. In the second set of data, verbs were marked for person and number in 88.25% of cases. But agreement errors were also present in the learners’ data. In the first recording, learners incorrectly used the singular form for the plural, which accounted for 50% of the agreement errors. They also showed random use of 1st, 2nd and 3rd person forms. In the second recording, agreement errors (11.75%) were distributed in the following way: 44% were errors of number whereas 56% were person agreement errors.

Bruhn de Garavito (2003) analyzed production of Spanish agreement morphology by 27 Spanish adult L2 learners. All were native speakers of English. For the oral task, participants first had to read a very short story in English and later they had to retell the story in Spanish. The author analyzed the verb agreement errors made by the participants and found that agreement error rates were low. Most of the learners (16 of 22 learners) were highly successful at producing agreement morphology leading to error rates of only 10%. Errors included the use of the 3rd person in place of the 2nd and the 1st person. Additionally, learners used the 1st person for the 3rd person and produced infinitives instead of finite forms.
There are very few studies that have looked at verbal morphology acquisition in child L2 learners of Spanish. To the best of my knowledge, there are only two studies that have analyzed verb inflection production in child L2 learners of Spanish. The first study, done by Herschensohn, Stevenson and Waltmunson (2005), examines data from 26 second-year Spanish immersion students and a small control group of 5 native speakers. Children were given two production tasks administered two days apart. In both of these tasks, children were shown 11 pictures and were asked in Spanish what the sentential subject was doing. Researchers used two methods of counting errors: absolute accuracy and number accuracy. Absolute accuracy evaluated whether the verb was correctly inflected for person, number, tense and mood, whereas number accuracy was limited to evaluate whether there was a number agreement error between the subject and the verb inflection. Results revealed that children’s inflection accuracy was predominantly poor but their syntax was practically target-like. When the results from the two production tasks were compared, it came to the researcher’s attention that the children significantly increased their accuracy score from the first task to the second, showing an average absolute accuracy of 28% and 40% and number accuracy of 38% and 56%, respectively. As for the type of errors, Herschensohn et al. (2005) point out that most errors involved the use of an incorrect inflection rather than omission inflection, which indicates that children were aware of verbal inflections. Herschensohn et al. maintain that the limited use of infinitive forms and their preference for inflected forms, although many times incorrect, serve as evidence that child L2 learners of Spanish show sensitivity to inflections. Most children’s errors consisted of substitution of singular forms for plural and vice versa. These errors were 57% of the agreement errors (about half and half of each). None of the children showed only one of the patterns and all
the children made errors in the two directions (i.e. plural for singular and singular for plural). Other errors included the use of infinitive forms (13%) and the use of the incorrect tense, mood or person (30%). The authors noted that none of the children used a default form, as has been observed in L1 acquisition; rather, they displayed a variety of target-like as well as incorrect forms. Moreover, the study concludes that children do have the relevant feature, but that mapping problems linked to “cognitive procedures of perception and storage rather than universal functional features of verbal Tense and Agreement” (p.211) interact with children’s performance.

The second study that evaluates verbal morphology in child L2 learners of Spanish is Lichtman (2013). The main objective of this study was to evaluate the effects that the type of instruction (i.e. implicit vs. explicit instruction) and age have on learners’ explicit and implicit linguistic knowledge. Generally, it has been assumed that children use implicit learning whereas older learners mainly rely on explicit learning strategies. However, there is no direct evidence that late learners could not benefit from implicit knowledge or that children could not benefit from explicit knowledge. In her study, Lichtman tries to offer some insight to this issue. Three groups were included in the analysis: 1) a group of child L2 learners exposed to implicit instruction (AoA, $M = 4;05$), 2) a group of adolescents also receiving implicit instruction (AoA, $M = 15;01$), and 3) a third group of adolescents receiving more traditional explicit language instruction (AoA, $M = 13;04$). All participants completed two tasks. One of the tasks (story rewriting task) was designed to tap into learners’ implicit knowledge. In this task, learners had to listen to a story twice. Each story was accompanied by an illustration. After listening to the story, participants were asked to rewrite the story as quickly as possible and not to edit it. The second
task, a verb conjugation completion task, intended to tap into learners’ explicit knowledge.
Learners were given a sentence with a blank and they had to conjugate the infinitive form of the
verb provided in parentheses (e.g. Yo _____ una computadora (querer) ‘I _____ a computer (to
want)’). In contrast to the story rewriting task, in the verb conjugation task, participants were not
time pressured to supply an answer.

The results from the tasks reveal that those learners who were exposed to implicit
teaching, did better in the implicit task (i.e. story rewriting task) than in the explicit task (i.e. verb
conjugation task) regardless of their age (i.e. children and adolescents). In contrast, the group
who was exposed to explicit teaching showed the opposite pattern and was more accurate in the
explicit task rather than in the implicit task. However, overall they exhibited higher rates of
accuracy than those showed by the children-implicit and the adolescent-implicit teaching group.
This was true for both the implicit and the explicit task. Another interesting finding reported by
Litchman was the fact that the Children-implicit group outperformed the Adolescents-implicit
group in the verb conjugation task. Children’s apparent advantage over adolescents could have
been related to the type of instruction received by the sixth-graders included in the Children-
implicit group. When the results from this group were analyzed separately, they were found to
parallel those showed by the Adolescent-explicit group. According to Litchman, what
distinguishes sixth-graders from the others included in the Children-implicit group is that they
“received a small amount of explicit instruction, including instruction on verb conjugation, in
addition to their regular implicit instruction” (p. 103). This would help explain the parallelism
between the sixth-graders and the Adolescent-explicit group. Taking into account the findings,
Litchman concluded that “instruction may have a greater impact on implicit versus explicit
learning than age does. When learning under similar implicit instruction conditions, both children and adolescents developed more implicit than explicit knowledge” (p. 106). Thus, the findings suggest that in learning the verbal morphological system of a language, older learners could benefit from implicit teaching and that implicit knowledge is still available to them.

3.5.2 Comprehension. I am aware of only two studies that have included a comprehension task to evaluate Spanish L2 verb morphology comprehension. One of these studies is Herschensohn et al. which tested comprehension of 3rd person of the present tense in child L2 learners. To access children’s knowledge, they used a picture matching task similar to the one used in Perex-Leroux (2005). Children were asked to listen to singular and plural sentences. In all the sentences, the subject was omitted, thus, learners sole cue to identify the number of the subject was the verb ending (e.g. Mira los peces/ Miran a los peces ‘She/they look at the fish). Children were instructed to point to the picture describing the sentence they heard. When the results from comprehension task were compared with those of the production task it was found that children were more accurate in comprehension (78%) than in production (e.g. 28%). In other words, children were more successful at distinguishing the verbal morphology than at producing it.

In Bruhn de Garavito (2003), a written recognition task was given to a group of adult learners of Spanish to test their knowledge of agreement verb morphology. Participants were presented with a short sentence they had to read. They were instructed to select, among five alternatives, the noun they thought best filled in the blank. See examples in (29) below.

(29)  Ernesto, Pablo y yo nadamos todos los días, pero solamente ______ juega tenis.
In this task, participants were highly accurate and they were successful at identifying the appropriate noun. When learners’ performance in production and in comprehension was compared, it was found that although they had done very well in production, they made twice as many errors in the production task than they did in the recognition task. In this study, participants’ knowledge of the verb-raising status of Spanish was also tested. The tasks were designed to evaluate participants’ grammatical judgments of word order in questions (i.e. subject-verb inversion) and adverb placement in Spanish. Results revealed that learners were able to clearly distinguish between grammatical sentences where the verb was raised and ungrammatical sentences were the verb failed to do so. In sum, this study’s findings suggest that learners’ grammatical knowledge of the L2 is not impaired. It also draws attention to the connections between the type of task and performance in second language learners. Participants’ performance was quite accurate in recognition, which, according to the author, may be explained by the possibility that “the processing load for production is considerably higher than for recognition” (p.402). This also leads us to the assumption that comprehension tasks are better at tapping into the learner’s knowledge of agreement morphology than production tasks.

3.5.3 Conclusion. Both L2 learners of English and L2 learners of Spanish have complex syntactic knowledge of the grammatical system of the target language. Linguistic data of these learners strongly suggest that functional features of the L2 are available to them and that learners may master the syntax of the L2 before they can master its morphology. It also stands out from the research that learners perform better in comprehension tasks than in production tasks. On one
hand, this finding could be taken as evidence that, although learners do not produce verb morphemes in a target-like manner, they do have knowledge of the morphological system of the L2. On the other hand, it uncovers the interaction between the type of task and learners’ performance. All this, in turn, may advance the assumption that learners’ difficulties with verbal morphemes may be related to performance factors rather than learners’ linguistic knowledge per se.

Despite the fact that English and Spanish L2 learners share some similarities (e.g. failing to produce verb morpheme and performing better in comprehension than in production), there are some patterns of acquisition observed in English L2 acquisition but not in Spanish L2 acquisition. In English, L2 learners’ omission of verbal inflection is much more frequent than in Spanish L2 learners, for whom errors of commission are more frequently found. Likewise, non-target-like verbal forms seem to persist longer in English L2 learners than in Spanish L2 learners, for whom target-like forms seem to be more rapidly acquired. However, it is important to note that the only longitudinal study on L2 Spanish is that of Mezanno and only two samples were collected within 64 hours of exposure. Moreover, to the best of my knowledge, there is no longitudinal study done in Spanish child L2 acquisition and the only study that I know of that has looked at Spanish L2 acquisition in school-age children is that of Herschensohn et al and Litchman (2013). Both of these studies do cross-sectional comparisons. Future longitudinal studies on child and adult L2 learners of Spanish would be able to offer more information on the matter.

There are also differences between child and adult L2 learners of Spanish. When the results of Spanish adult L2 learners are compared with those of the children tested in
Herschensohn et al., it is clear that adults show higher percentages of accuracy than children. This difference may be related to the type of instruction that children and adults receive and to the cognitive capacities of adults and children. In total immersion programs, both academic and content instruction are delivered in the second language. In such programs, school subjects like science, history or mathematics are given in the target language and students learn the second language “incidentally” by being exposed to highly meaningful input (Genesee 1991). Therefore, the second language is acquired through implicit teaching and learning. In contrast, adults learn the second language in a classroom setting, where although classes are communicative in nature, acquisition happens in a more explicit way. Implicit learning, although a more reliable kind of language learning, may occur at a slower pace than explicit learning (Ellis 2005). As for cognitive capacities, adults’ working memory is larger than in children, thus, allowing the former to retain more verbal information than the latter (Carroll 2008). All this would explain why second language acquisition in children occurs at a slower pace than in adults or older children (Lichtman 2013).

Cross-linguistic differences observed in L2 verbal morphology acquisition has been related by some to the verb-raising status of the language. White (1992) noticed that the process of affix lowering in English is less economical than the verb-raising process. Likewise, Zobl and Liceras (1994) suggest that affix lowering in English “represents an additional step in the derivation of the surface form” and, as a consequence, this movement is marked vis-à-vis verb-raising movement (p. 165). These authors conclude that the type of movement could help explain English L2 learners’ difficulties with tense and agreement affixes.
Along similar lines, Ionin and Wexler (2002), based on a model proposed for L1 acquisition by Guasti and Rizzi (2001), proposed that L2 learners have access to Universal rules but that language-specific morphological rules need to be learned. According to the proposal, features that are overtly checked depend on UG whereas features that are checked covertly depend on language-specific rules. As it was describe in Chapter 2, timing of feature checking may vary between languages. In Spanish, all verbs are assumed to have their features checked before the Spell-out (i.e. overtly). In English, on the other hand, AUX verbs are checked overtly but lexical verbs check their features after the Spell-out (i.e. covertly). Therefore, and following Ionin and Wexler’s (2002) proposal, feature checking of English lexical verbs will be a language-specific rule rather than a Universal rule which will be the case for AUX verbs. Ionin and Wexler’s proposal makes specific predictions about acquisition of languages with different verb-raising status. It assumes that feature checking in English lexical verbs is a language-specific rule, therefore, and according to this view, learners of English are expected to take a long time to master inflectional morphemes because they have to acquire the specific rule that governs thematic verbs in English. It predicts that learners’ initial analysis of thematic verbs will affect both the production and comprehension of inflectional morphemes. It also predicts that L2 learners of a language in which thematic verbs raise overtly (e.g. Spanish) will show lower rates of verbal-inflection omission because learners have access to UG.

The proposals drawn up above do not attribute verbal-morpheme omission in L2 learners to grammatical impairment but relate learners’ difficulties to the verb-raising status of the language and the processing demands that a non-verb raising language like English entails. This syntax-processing view seems to rightfully explain and predict learners’ errors of omission.
However, the proposal’s soundness becomes weakened when explaining learners’ commission errors and gradual development of verbal inflections.

If, as proposed by Ionin and Wexler, English L2 learners’ inflection is optional in non-verb raised verbs (i.e. lexical verbs) and they do not analyze affixes such as English 3rd person –s as an inflectional morpheme, one may expect L2 learners of English to frequently drop this morpheme, and L2 learners of a verb-raising language to show low rates of non-inflected forms. Indeed, studies on Spanish and English L2 acquisition seem to support both of these claims. However, this proposal does not make predictions regarding the type of errors made by the learner and does not offer an explanation as to why commission errors are far more common in Spanish L2 learners than in English L2 learners.

Ionin and Wexler’s proposal states that in learners of English, lexical verbs may be optionally inflected. If, as they propose, learners’ difficulties are a matter of learning English specific rules, why, then, do learners gradually become better at producing verbal inflections rather than showing a rapid increase in the number of inflected verb forms. Take for example the case of subject acquisition. In English, an overt subject is required and null subjects are not allowed. It has been observed that learners fail to produce overt subjects in the early stages of acquisition but once they realize the non-subject setting of English, they become highly proficient and rarely omit the subject (Haznedar 2003). However, verbal inflection often appears at later stages of acquisition and its acquisition is rather gradual and slow. Even after having been exposed to English for a relatively long period of time, children still frequently omit the inflection. Under the proposal, auxiliary verbs are assumed to start with the correct setting and, as predicted, they are not highly problematic to learners. Moreover, child L2 learners of English
seem to treat lexical and auxiliaries as syntactically distinct (e.g. no inversion of lexical verbs in yes-no questions).

However, if as proposed for L1 acquisition (Phillips 1995/2010), L2 verb morphology acquisition interacts with learners’ performance system and performance in turn interacts with the language’s verbal inflection paradigm, then this would help explain learners’ gradual acquisition, the commission errors in learners, and the cross-linguistic differences. Reported data from L2 learners of French, a verb-raising language with a not highly inflected paradigm, and German, also a verb-raising language but with more morphological distinctions than French, might offer us some insight on the matter.

Prévost and White (2000) evaluate longitudinal data of two L2 learners of French (Abdelmalek and Zahra) and two L2 learners of German (Ana and Zita). The French learners had approximately three years of exposure, while the German learners had little less than two years of exposure. One of them (Ana) had many more opportunities to use the target language than the others. These learners were found to be very successful at verb-placement and appear to have acquired verb movement of French and of German, respectively. The use of non-finite forms in finite contexts was observed in all four learners, but in the French learners, the incidence of non-finite forms was higher (Abdelmalek: 24.1%, Zahra: 22.9%) than in the German learners (Ana: 10.4%, Zita 16.4%). Learners’ commission errors were also reported in this study, that is, instances where the learner produced an inflected form but with incorrect agreement. The French learners produced few forms with incorrect agreement (Abdelmalek: 4.2%, Zahra: 5.5). In the German learners, although commission errors were also infrequent, they showed higher percentages than the French learners (Ana:11.9%, Zita:12.2% ).

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In sum, learners of the language with more morphological distinctions (i.e. German) show lower rates of non-finite forms and higher rates of commission errors; while the learners of the language with less morphological distinctions (i.e. French) show higher rates of non-finite forms but lower rates of commission errors. Furthermore, in these learners’ data, the rate of non-finite forms is higher than that reported in the Spanish L2 learners data (e.g. 4% of infinitives). Nevertheless, Spanish and German L2 learners show similar rates of commission errors, both groups of learners showing error rates close to 12%. These findings suggest that taking into account learners’ performance difficulties as well as the richness of the morphological paradigm seems to be a promising approach to explain cross-linguistic differences between L2 learners of English and of Spanish.

As described in Chapter 2, Spanish and English morphological systems are very different. The English verbal inflectional paradigm is irregular and poor. In English, inflections are not regularly found in the paradigm, indeed all but one verbal form (i.e. 3rd person singular) marks agreement. The Spanish paradigm, in contrast, is highly inflected and regular. For instance, in English, only the 3rd person singular of the present tense is marked for number, while all Spanish verbs are marked for agreement in all tenses. One thing one might consider is that learners of Spanish have more practice with the process of accessing and retrieving verbal inflections, whereas opportunities for English learners to engage in this process are limited. Practice, as describe by Ellis, “involves an attempt to supply the learners with plentiful opportunities for producing targeted structures in controlled and free language use in order to develop fully proceduralized implicit knowledge” (1993, p. 109). I should clarify, however, that the present study will adapt a narrower version of Ellis’ definition and limit the concept of
practice to the opportunities learners have to produce L2 structures in free (not controlled) language use. If this definition of practice is to be extended to L2 morphological acquisition then one can assume that by giving the learner opportunities to access the verbal morpheme system of the L2, learner’s morphological knowledge can become proceduralized, therefore making grammatical processing more automatized, more effortless and faster. Hence, if morphological access in learners changes from being effortful and slow to becoming a more automatized process, an improvement in learners’ performance would be expected, but, as with any activity, that requires practice; improvement will occur gradually and errors might be expected. In the process of acquiring the verbal system of the target language, learners may experience difficulties merging the verb with the inflection and, as a consequence, may omit the inflection or use an inappropriate one. In addition, if as suggested morphological acquisition is related to practice, one might expect that within a group of learners of the same target language, those that have more time of exposure will be more successful than those with less time of exposure. The reasoning behind this prediction is that those who have more exposure will have more opportunities to be engaged in the process of morphological access than those who have less exposure.

To summarize, results from studies done on L2 learners of English and L2 learners of Spanish indicate that they have knowledge of the language verb-raising status and also of functional features of Agr and T. Both groups of learners seem to recognize that finite and non-finite forms are different and take into account the linguistic restrictions of these forms. For instance, learners do not allow non-finite forms in *wh*-structures or supply a finite form in a non-finite context. Despite their similarities, findings in both groups suggest that L2 learners of
English and L2 learners of Spanish are quantitatively different. L2 learners of English tend to frequently drop the verbal inflection and produce non-inflected forms, whereas L2 learners of Spanish show lower rates of non-inflected forms and produce more commission errors than English L2 learners.

The morphological structure of the target language may seem to play a role in learners’ performance. The verb paradigm of the target language seems to facilitate or delay the automatization of the morphological processing (e.g. accessing, merging and retrieving of inflections) in L2 learners. The opportunities a learner has to access his morphological knowledge may have an effect in the process of acquisition. Therefore, a language that provides more opportunities for the learner to access his morphological knowledge (i.e. highly inflected language) will facilitate more the process of morphological acquisition than a language that provides fewer opportunities (i.e. poorly inflected language).

As I mentioned above, some have adopted (Ionin & Wexler 2002; Zobl & Liceras 1994; White 1992) a syntactic approach and have suggested that the verb-raising status of the language has an effect in the process of morphological learning. However, instead of looking at the type of verb-raising status, we could look at the richness of the paradigm to explain learners’ performance. Under a more morphological approach, learners of a highly inflected language would be assumed to have more opportunities with raising the verb and merging it with the appropriate functional feature in IP than those learners who are learning a poorly inflected language. That is, the relation is that the richness of the verbal paradigm facilitates the mastering of the process of merging the verb with the appropriate functional feature rather than the type of verb-raising status that facilitates such process. This for example would help explain why L2
learners of Russian, a non-verb-raising language and a richly inflected language (Bailyn 2002), show high rates (e.g. close to 80%) of verbal inflection accuracy (Tkachenko & Chernigovskaya 2010). The findings for the Russian L2 speakers suggest that non-verb raising languages are not necessarily harder to master, but instead that the richness of the paradigm might play a role in the process of verbal morphology acquisition.

The proposed approach would help explain not only why learners of English show relatively higher rates of verbal omission and lower rates of commission errors than learners of more inflected languages, but also the different rates of omission and commission errors observed in Spanish and other less inflected verb-raising languages (e.g. French, German), as well as the differences between L2 learners of French and L2 learners of German. In addition, it would explain the differences between non-verb raising languages that differ in the richness of their verbal paradigm (e.g. Russian vs. English).

Another factor that has been suggested to play a role in morphology acquisition in L2 learners is the differences (or similarities) found between the prosodic structure of the target language and that of the learner’s native language. Thus far, I only know of one study that adopts the PTH and that is relevant to the present discussion. Lieberman (to appear) reported that the prosodic structure had an effect in Spanish-L1 English-L2 learners’ production and comprehension of English verbal morphology. Lieberman reported that, as expected by the PTH, Spanish-L1 English-L2 learners used reparatory strategies in production. Surprisingly, it was also found that the prosodic structure had an effect in learners’ comprehension. This had not been predicted under the original PTH proposal. This study, however, was done with adults and with a small sample of learners (7 participants). No study that I am aware of has evaluated the
effect that might have the prosodic structure in child L2 learners’ verbal morphology production and comprehension. Therefore, the effects of the prosodic structure in child L2 learners remain a matter of speculation, especially in those children where the prosodic structure of the target language differs from that of their L1.

As discussed in Chapter 2, the prosodic structure that underlies verbs in English and Spanish is different. In English, the inflection is adjoined to PWd, whereas in Spanish, inflectional morphology is incorporated within the PWd as an internal clitic. Keeping this in mind, it may be proposed that Spanish -L1 English-L2 learners, lacking the adjunction prosodic structure for regular verbs in their L1, will have to accommodate the representation through combining licensing relations available in Spanish (i.e. inflectional morphology internal to PWd). For instance, they may treat regular forms as monomorphemic forms (\textit{wide} ([\texttt{wɪt}-\texttt{ø}]_{\text{PWd}}) or like pseudo-irregular verbs, such as \textit{kept} ([\texttt{kɛp-t}]_{\text{PWd}}). If this were the case, then we will expect learners to be more successful with short stem verbal forms (e.g. –VC) than with long stem forms (e.g. –VVC and –VCC), which already have three positions and cannot use an internal clitic structure. In other words, they may use internal clitic structure for short stems as repair strategy. Thus the PTH predicts that learners will eventually be able to build the adjoined prosodic structure of English regular verbs.

By contrast, English-L1 Spanish-L2 learners will have to extend the prosodic structure they already have available for English irregular or pseudo-inflected verb forms (i.e. PWd internally) to Spanish regular verbs. Therefore, they will not have to build a new prosodic structure (i.e. PWd adjunction) as Spanish-L1 English-L2 learners will have to do. Taking this into account, we might then predict that it will take longer for English L2 learners to improve and reach high levels of performance than what it will take for Spanish L2 learners whose L1 is English.
In sum, we will expect verbal morphology to be less problematic to Spanish-L1 English-L2 learners than to English-L1 Spanish-L2 learners who will have to build a new prosodic structure rather than just using an existing one. In order to build an adjunction structure, English L2 learners will have to adapt L1 structures. In this “adaptation” process, learners are expected to rely on reparatory strategies. In particular, learners are expected to show asymmetry between their performance in short stem verb forms and their performance in long stem verb forms. Learners are expected to do better with the former because they will tend to treat these forms as pseudo-inflected verbs or monomorphemic forms. By contrast, English-L1 Spanish-L2 learners do not have to build new phonetic structure. Instead, they will have to adapt a structure that already exists in their L1.

As stated in Chapter 1, the present study has two main goals that are repeated here for the reader’s convenience: (1) to ascertain whether children are able to produce verbal inflection and whether they are able to comprehend it; and (2) to determine whether cross-linguistic differences found between English and Spanish verbal inflectional systems play a role in the acquisition of verbal morphology by child L2 learners or whether, on the contrary, the acquisition of verbal inflection is similar for all children regardless of the target language. Before describing the methodology, the research questions that are posed and that will guide the study are presented below along with the predictions:

- **Are child L2 learners of Spanish successful at producing the verbal inflection for 3rd person plural –n?**

Child L2 learners of Spanish, a highly inflected language, are provided with more opportunities to access their morphological knowledge when they articulate a message than, for example, L2 learners of a poorly inflected language. In Spanish, all verbal forms
have some sort of inflection. There are also many morphological cues to indicate plurality (e.g. inflection in articles, adjectives and other verbal plural forms). If a learner’s opportunities to access the verbal morpheme system of the L2 helps proceduralize the learner’s morphological knowledge, making it more automatized, more effortless and faster, I expect child L2 learners of Spanish to show high rates of accuracy in producing the inflection for 3rd person plural -n.

- **Are child L2 learners of Spanish able to use the verbal inflection for 3rd person plural –n to assign number to the noun phrase?**

Child L2 learners of Spanish, a highly inflected language, are provided with more opportunities to access their morphological knowledge when exposed to the language input or when comprehending a message in the target language than, for example, L2 learners of a poorly inflected language. If learners’ opportunities to access the verbal morpheme system of the L2, help proceduralize a learner’s morphological knowledge, therefore making it more automatized, more effortless and faster, then I predict that child L2 learners of Spanish will be successful in comprehending the Spanish 3rd person plural –n as a number marker.

- **Are Spanish L2 learners affected in the same way in both the production and the comprehension task?**

Production and comprehension are assumed to use the same systems of grammatical representations. If the opportunities learners have to access their morphological knowledge, either in the input they receive or in the output they produce, promote their global performance, I expect learners to perform similarly across tasks. However,
because both processes impose different demands on the learner and the processing load for production is considerably higher than for recognition or comprehension, I expect that if learners perform better in one of the tasks, they will be more accurate in the comprehension task than in the production task. Although the opposite has been found in L1 acquisition, because the children who will be tested here are older than those reported in L1 acquisition, I will expect learners to parallel with what has been found in child L2 learners, who, in general, have been found to perform better in comprehension tasks.

- **Are child L2 learners of English successful at producing the verbal inflection for 3rd person plural –*n***?

Because English is assumed to be a poorly inflected language, child L2 learners of English are provided with less opportunities to access their morphological knowledge when they articulate a message than, for example, L2 learners of a highly inflected language. If a learner’s opportunities to access the verbal morpheme system of the L2 helps proceduralize the learner’s morphological knowledge, I expect child L2 learners of English to show low rates of accuracy in producing the inflection for 3rd person singular –*s relative to, for example, Spanish L2 learners.

- **Are child L2 learners of English able to use the verbal inflection for 3rd person singular –*s to assign number to the noun phrase***?

I assume that child L2 learners of English are provided with fewer opportunities to access their morphological knowledge when exposed to the language input or when comprehending a message in the target language than, for example, L2 learners of a highly inflected language. If learners’ opportunities to access the verbal morpheme
system of the L2 help their morphological knowledge become proceduralized and more automatized then I would expect that morphological acquisition in child L2 learners of English will take longer than, for example, in learners of a highly inflected language. Therefore, I expect child L2 learners of English to show low rates of accuracy in comprehending the English 3rd person singular–s as a number marker.

- **Are English L2 learners affected in the same way in both the production and the comprehension task?**

  Production and comprehension are assumed to use the same systems of grammatical representations. Because both processes impose different demands on the learner and the processing load for production is considerably higher than for recognition or comprehension, I expect that if learners are to perform better in one of the tasks, they will be more accurate in the comprehension task than in the production task.

  In the following chapters, I put these hypotheses to the test in four related experiments that examine the production and comprehension of subject-verb agreement morphology in children learning a highly inflected language as L2 (i.e. Spanish) and children learning a poorly inflected language as L2 (i.e. English).
CHAPTER 4
SPANISH EXPERIMENTS

A goal of the present study is to ascertain whether the structure of the target language has an effect on the accuracy. In addition, it serves to ascertain whether children are able to produce verbal inflection and whether they are able to comprehend it in the same way. In order to attain the study’s objectives and to address the research questions posed in this study, I tested a group of child L2 learners learning Spanish as L2. Two experiments were designed to assess children’s knowledge. The experiments examined the production and comprehension of the Spanish 3rd person plural –n.

This chapter presents the methodology followed in the Spanish experiments and shows the results obtained from both the Spanish production task and the Spanish comprehension task. First, the participants who participated in the study are described. Next, a description of the tasks is provided, along with the procedures and the analysis used to evaluate the responses given by the children. Finally, the results of the Spanish tasks are presented.

4.1 Participants

A total of 32 English-speaking children learning Spanish as their L2 participated in the study. The children’s ages ranged from 7;5 to 10;11 years old with a mean age of 9;0 years. The age distribution of the children is shown in the Table 4.2:
Table 4.1

*Age Distribution of the L2 learners of Spanish*

<table>
<thead>
<tr>
<th>Age of participants</th>
<th>Number of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>7;5 – 7;9 ($M = 7;7$)</td>
<td>5</td>
</tr>
<tr>
<td>8;0 – 8;8 ($M = 8;5$)</td>
<td>11</td>
</tr>
<tr>
<td>9;0 – 9;11 ($M = 9;4$)</td>
<td>11</td>
</tr>
<tr>
<td>10;1 – 10;11 ($M = 10;6$)</td>
<td>5</td>
</tr>
</tbody>
</table>

At the time of testing (Spring 2012), all the participants were enrolled in a Spanish early total immersion program at a school in Michigan. A questionnaire about each child’s linguistic background was sent home for parents to fill out. According to parental reports, all children were native speakers of English, spoke English at home, and had not lived in any country other than the United States. Most of these children ($n = 27$) started learning Spanish when they went to pre-k or kindergarten at the ages of 4 or 5 respectively (mean age 4.9 years old). An age of acquisition of 6 years old was reported for four of the children and only one child was reported to have started learning Spanish at the age of 7. The time of exposure to the target language ranged from 2 to 6 years with a mean of 3.8 years. Table 4.3 describes the participants’ individual linguistic background.
Table 4.2

*Spanish L2 learners’ individual linguistic background*

<table>
<thead>
<tr>
<th>Participant</th>
<th>Gender</th>
<th>Age (year; months)</th>
<th>AoA</th>
<th>ToE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>7;5</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>7;6</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>7;6</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>F</td>
<td>7;8</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>F</td>
<td>7;9</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>F</td>
<td>8;0</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>F</td>
<td>8;1</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>F</td>
<td>8;2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>F</td>
<td>8;2</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>F</td>
<td>8;5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>11</td>
<td>F</td>
<td>8;5</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>12</td>
<td>F</td>
<td>8;6</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>13</td>
<td>M</td>
<td>8;6</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>M</td>
<td>8;7</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>M</td>
<td>8;8</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>16</td>
<td>F</td>
<td>8;9</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>17</td>
<td>F</td>
<td>9;0</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>18</td>
<td>F</td>
<td>9;1</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>19</td>
<td>F</td>
<td>9;4</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20</td>
<td>F</td>
<td>9;4</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>21</td>
<td>M</td>
<td>9;4</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>22</td>
<td>M</td>
<td>9;4</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>23</td>
<td>F</td>
<td>9;5</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>24</td>
<td>F</td>
<td>9;5</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>25</td>
<td>F</td>
<td>9;7</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>26</td>
<td>M</td>
<td>9;11</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>27</td>
<td>M</td>
<td>10;1</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>28</td>
<td>F</td>
<td>10;4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>29</td>
<td>M</td>
<td>10;6</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>30</td>
<td>M</td>
<td>10;7</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>31</td>
<td>F</td>
<td>10;8</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>32</td>
<td>M</td>
<td>10;11</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>

The native control group was composed of 32 Spanish-speaking children with an age range of 7;7- 9;9 (M = 8;9 years old). The native speakers were all speakers of Puerto Rican
Spanish and were living in San Juan, Puerto Rico at the time of the testing. The native speakers and learners were age-matched and no significant difference was found between the group’s ages ($F(1,62) = 1.483, p > 0.5$). They were all reported to speak Spanish at home. In addition, they were all English L2 learners and served as the experimental group for the English experiments, discussed next. That is, both the Spanish L2 learners as well as the Spanish native speakers were bilinguals. The fact that no monolingual native speaker groups were included is not a limitation in the study. Indeed, comparing bilingual groups rather than bilinguals against monolinguals could be seen as an advantage of the present study. Recently, SLA research has advocated for a different focus in L2 acquisition (Ortega 2013). Traditionally, L2 acquisition has been studied by comparison to L1 acquisition and native speaker adults as divergent (or defective) from the monolingual norm. However, Ortega (2013) advocates for a new framing that would throw L2 acquisition under a more positive light; one that focuses on “what is unique in learning a new language later in life” (p. 15) rather than on learners’ deficiencies. Ortega further explains that both monolinguals and bilinguals are linguistically different; therefore, comparing both groups may not be the best approach. Instead, comparing bilingual groups can be more insightful.

4.2 Spanish Production Task

To elicit children’s knowledge of Spanish 3rd person plural-$n$, a picture description task was designed. The pictures were in color and drawn on medium-size index cards. They showed a girl and a boy doing activities such as cleaning, eating, and playing (Figure 4.1). With the aim of eliciting a variety of verbs and of assuring that participants’ responses were not limited to the use of the present progressive, which in Spanish is formed with the copulative verb *estar* (‘to be’) plus the gerund (e.g., *Ellos están jugando* ‘They are playing’), participants were prompted to use
the simple present tense. They were instructed to describe the pictures using a structure such as

*Ellos siempre…* ‘They always…’. The task included 2 practice items and 10 target items. All the

children’s responses were audio recorded, transcribed and coded for analysis.

![Figure 4.1: Examples of the Spanish production task: Two children playing soccer (Left); Two children watching TV (Right)](image)

**4.2.1 Analysis: Production task.** For the production task, accuracy errors were tabulated

using two methods of counting errors. In the first method, I evaluated the absolute correctness

(absolute accuracy) of the form produced by the child. I looked at the appropriateness of tense

and mood, and at the correctness of the inflection produced. In the second method of counting, I

evaluated whether verbs were correctly inflected for third person plural regardless of whether the

mood or tense was appropriate (number accuracy). If a child, for example, produced the sentence

in (30) she would receive zero in Absolute accuracy. In this example, the child produced a verb

form in the subjunctive mood instead of the indicative mood—the appropriate mood for the

context of the sentence. However, she would receive one point in Number accuracy because,

although the mood was not appropriate, the child did produce the correct inflection for 3rd

person plural –*n*. 

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The second method of counting (i.e. number accuracy) was the main focus of the data analysis. This was done with the purpose of evaluating number errors independently of other types of morphological/semantic errors.

4.3 Spanish Comprehension Task.

Comprehension of the relevant verb inflection (i.e. 3rd person plural –n) was accessed through a picture matching task. The task included 3 practice items, 10 target items and 9 filler items. As in the tasks previously included in Pérex-Leroux (2005) and Herschensohn, Stevenson and Waltmunson (2005), the target sentences were designed to evaluate children’s knowledge of verbal inflection by assessing their capacity to use the verbal inflection as the sole clue to identify the number of the noun phrase. However, in contrast to the studies just mentioned, null-subject sentences were not used; instead, sentences with overt subjects were included. This was done with the intent of making the Spanish and the English tasks (to be discussed in a following section) as comparable as possible. In the target items, children were presented with sentences where plurality in the subject was masked. Plurality was disguised by using plural subjects and verbs that started with s-. In Spanish, like in English, the affix –s denotes plurality in the noun phrase (e.g. La niña vs. Las niñas ‘the girl vs. the girls’). However, in contrast to English, articles must agree with the noun in gender and number in Spanish, as shown in (31). Therefore, learners could rely on the article marker to determine the number of the noun phrase.
As a solution to this problem, pronouns instead of lexical subjects were used. Spanish pronouns must agree with the verb in number as shown in (32) but unlike nouns, they are not accompanied by an article.

(32)  

<table>
<thead>
<tr>
<th>a. Ella</th>
<th>salta</th>
<th>en el parque</th>
</tr>
</thead>
<tbody>
<tr>
<td>She-FEM</td>
<td>plays</td>
<td>in the park</td>
</tr>
</tbody>
</table>

‘She plays in the park’

<table>
<thead>
<tr>
<th>b. Ellas</th>
<th>saltan</th>
<th>en el parque</th>
</tr>
</thead>
<tbody>
<tr>
<td>They-Fem-PL</td>
<td>play-3PL</td>
<td>in the park</td>
</tr>
</tbody>
</table>

‘They play in the park’

Pronouns allow for the masking of plurality by using verbs that start with –s, as shown in (32). However, only feminine pronouns were used in the task. Masculine plural pronouns are not formed by just adding –s to the singular form, as it is the case for the feminine forms; rather, the singular and the plural pronouns take two different forms: él ‘he’ and ellos ‘they’. Thus, the number in masculine singular pronouns cannot be masked with verbs that start with s-. See examples in (33). Therefore, the target items in the task only included feminine singular and plural pronouns as in the example in (32) above.
(33) a. Él juega en el parque
   He play-3rd.sg in the rope
   ‘He plays in the park’

b. Ellos juegan en el parque
   They-Masc. play-3rd.pl in the park
   ‘They play in the park’

All the sentences included in the task were recorded by a Spanish native speaker who
was instructed to read the sentences at a natural speech rate and not to pause between the subject
and the verb of the sentence. In natural connected speech, speakers would not pause between the
noun phrase and the verb. And in sentences like the ones included in the experiment, both the –s
of the noun phrase and the s- of the verb would merge into one sound and, thus, not contain clear
cues for word boundaries. In this way, participants were forced to use the verbal inflection –n to
correctly identify the number of the subject of the sentence. However, it must be admitted that
there may be subtle prosodic cues to singular and plural in the boundary between the noun and
the verb (Hualde 2004). In norming the task, it was found that adult native speakers were able to
correctly identify the number of the pronoun with an accuracy of 52% for the singular and 50%
for the plural when only the segment containing the pronoun and the first syllable of the verb
was played (i.e. not including the verb ending). Nevertheless, adult native speakers perform at
ceiling when they listen to the stimuli including the verb ending . Therefore, although there may
be prosodic cues to singular and plural in the word boundary between the pronoun and the verb,
the verb ending is a more reliable way to identify the subject, and speakers must rely on the verb
ending to reach target-like performance.
For each target sentence, a singular and plural version was recorded. The pre-recorded stimuli were presented to participants along with a group of pictures. See example in Figure 4.2. Pictures were shown to participants in groups of three on a computer screen. One picture had a single person performing an action, a second picture showed two subjects performing the same action as the single-subject picture. A third picture was included as a distractor. The distractor showed either a single subject or two subjects performing a completely different action. The practice and the filler items followed a similar format to that of the target items, although in the former items sentences had a different structure.

Figure 4.2: Example of the Spanish comprehension task

The three practice items, as well as three of the fillers of the experimental section, were null-subject sentences. For all six of these sentences, only one version of the sentence, either singular or plural, was created. The other six fillers included in the experimental section were sentences with overt subjects, none of which masked the plurality of the noun phrase (i.e. none of the verbs started with s-). Like in the target sentences, only pronouns were included in these items. However, unlike with the target items, in these sentences both feminine and masculine pronouns were included. For each of these six sentences (non-masked fillers, henceforth) a singular and
plural version was recorded. Two forms of the task were created: Form A and Form B. Each form included 22 items (i.e. 3 practice items, 10 target items and 9 fillers). The target and the non-masked filler sentences were counterbalanced between each. For instance, if one form of the task (e.g. Form A) included the singular version of the sentence, then the other form (e.g. Form B) would include the plural version. As for the practice items and the three null-subject fillers, they were the same in both task forms. Therefore, each form included one practice section that was the same for both forms. It included: two singular stimuli and one plural stimulus; and an experimental section that included: 10 target sentences, all counterbalanced across task forms (five singular and five plural); six non-masked filler sentences, also counterbalanced across task forms (three singular and three plural); and three null-subject sentences (two singular stimuli and one plural) that are the same in both task forms. Table 4.3 includes sample sentences and their distribution in the two task forms.
4.3.1 Analysis: Comprehension Task. In the analysis of the comprehension task, the child’s accuracy at pointing to the right picture was evaluated. For accuracy, a child received a score of 1 if she pointed to the right picture and a score of 0 if she selected the incorrect one. Therefore, each participant could receive a total score ranging from 0 to 10 in the target items (5 points for the singular noun phrases and 5 points for the plural noun phrases). However, a participant might also choose the distractor picture or might not choose any picture. For example, if presented with a plural stimulus four responses might have been expected from the child:

a. The child might correctly choose the plural-subject picture (e.g. the child chooses the picture of two girls jumping rope when the sentence is *ellas saltan la cuerda* ‘they jump rope’).
b. The child might incorrectly choose the singular-subject picture (e.g. the child chooses the picture of one girl jumping rope when the sentence is \textit{ellas saltan la cuerda} ‘They jumps rope’).

c. The child might incorrectly choose the distractor picture (e.g. the child chooses the picture of a girl playing hopscotch when the sentence is \textit{ellas saltan la cuerda} ‘they jump rope’).

d. The child might not give any response. She might not point to any picture.

If the child’s response was \textit{a}, that is, if the child pointed to the correct picture, then she was given one point. However, if the child selected a singular subject picture when the stimulus was plural (i.e. case \textit{b}) then a zero was given. If instead of choosing either the plural or singular version of the stimulus she heard, the child pointed to the distractor or did not point to any picture, these responses were not included in the general analysis, as they may indicate that the child was not paying attention or that she did not understand the sentence. To measure the child’s accuracy in the singular and plural condition, her proportion of correct answers in the singular and plural items was quantified as follows. For example, if out of the five singular items the child correctly identified only one item, incorrectly identified three items and pointed to the distractor in the remaining item, then the proportion of correct answers for the singular condition was divided between the total of responses not including the distractor response (i.e. one correct response/four valid responses = 0.25 accuracy).

In addition to measuring learners’ accuracy in matching the stimulus to the correct picture, a calculation to measure their sensitivity to the inflection was also included. Following Rice, Wexler and Redmond (1999), an adjusted measure of sensitivity \(A’\) was carried out. See
equation in (34). This measurement according to Rice et al. “can be interpreted as the proportion of correct responses attainable in a two-alternative, forced-choice procedure” (p. 952). It was calculated by determining the proportion of hits (i.e. values $y$) and the proportion of false alarms (i.e. values $x$). Values of $y$ (hits) were calculated as follows: for all items marked as 3rd person plural -$n$ the proportion of correct selection of the plural picture. Values of $x$ (false alarms) were calculated as follow: for all the items not marked as 3rd person plural –$n$ (i.e. 3rd person singular) the proportion of incorrect selection of the plural picture.

\[ A' = 0.5 + \frac{(y - x)}{4y} \left( \frac{1 + y - x}{1-x} \right) \]

For example, a child might have correctly selected the plural picture in all the items marked as 3rd person plural (i.e. $y = 1$), but he might have incorrectly selected the plural picture in three out of the five singular items (i.e. $x = .60$). Therefore, when calculated, this child’s sensitivity to the inflection is .56. This calculation was made for each participant.

4.4 Procedures

The tasks were administered individually. Both groups of native speakers and learners completed the tasks in the library of their school. All children completed four tasks on the same day. The learners completed two tasks in their second language (i.e. Spanish) and two in their L1 (i.e. English). This allowed the responses given by this group of children in the English tasks to be compared, in a later section, to the responses given by the group of children learning English as their second language. Therefore, this group functioned as the experimental group in the Spanish tasks and as the control group in the English tasks.
The tasks followed similar formats and were comparable between languages. The administration of the tasks was separated by language and the tasks were given to the children at different times of the same day with approximately two to three hours between each. The tasks in the native language of the child (i.e. English tasks) were given first and later they completed the Spanish tasks. The opposite order was followed for the control group. This was done with the purpose of familiarizing the child with the task format in their first language. In what follows, I describe the procedure used in the administration of the Spanish tasks.

All children, the native speakers and the learners, did the production task first and later completed the comprehension task. Some have suggested that learners’ performance may be influenced by the language mode the bilingual is in (Grosjean 1999). To promote learners to be in the language mode in which they were tested, instructions were given to them in Spanish for the Spanish tasks and in English for the English tasks. However, if the child seemed to not understand the instructions or if they appeared to be more comfortable speaking in their native language the experimenter gave them the instructions in the child’s native language.

In the production task, children were instructed to describe the action represented in the pictures by using phrases like “Ellos siempre…” or any phrase that indicated that the actions represented were done habitually by the characters in the pictures. If they used the present progressive, children were encouraged to use simple aspect. For example, the experimenter might say to them in Spanish What about if you use a phrase like Ellos siempre… Most of the time this worked and they completed the phrase using a simple tense (e.g. the simple present tense or the imperfect tense). Although the pictures depicted a single action (e.g. cleaning or reading), elicitation was not verb specific. That is, the children might use different verbs to
describe the same picture. Children were also instructed that if they were not sure about what verb to use to describe the picture, they could use any verb they thought was appropriate and that any response they gave would be acceptable. Therefore, a variety of verbs was elicited. Positive feedback was given to children regardless of whether they supplied the correct verb form.

As for the comprehension task, children were asked to put on a set of headphones and they were told to listen carefully to each sentence and to point to the picture they thought had been described. Pictures were shown to participants in a PowerPoint presentation. The researcher had a copy of the presentation for each participant. On it she circled the picture to which the child pointed on the computer screen. Children were also told that they could listen to the sentence as many times as they liked.

4.5 Results

4.5.1 Production Task. In total, 320 utterances were counted and coded for the L2 learners (i.e. 10 utterances x 32 children). Not all utterances were included in the analysis and 10 of them were discarded. These 10 verbs were all of the Gustar–type psych verbs (e.g. *A Ellos siempre les gusta montar bicicleta* “They always like to ride bicycles”). The analysis of Gustar-type psych verbs is very complex and L2 learners seem to have difficulty mastering sentence structures that contain this type of verb (López Jiménez, 2003, Montrul & Bowles, 2010). Gustar-type psych verbs have the following structure: dative experiencer + verb + subject, which is a sentence order that differs from the fixed word order of English. English is assumed to be a SVO language, meaning that such order is required by most English sentences. English speakers learning Spanish may have difficulty identifying the subject of such sentences. Even among native speakers, identifying the subject of these sentences may not be very intuitive and they may
identify the dative experiencer as the subject. Some have even proposed that the dative experiencer is the logical subject of this sentence and the constituent that has been traditionally assumed to be the subject is indeed a nominative object (Medina & Matera, 2005). Because the use of this kind of verb may tap into other types of knowledge (e.g. word order) rather than on the focus of this study (i.e. subject-verb agreement), I decided not to include the *Gustar*-type verbs produced by the participants.

The remaining utterances (i.e. 310 utterances) were scored for Absolute and Number accuracy. The accuracy scored by the learners was compared to that of the group of the native speakers. Natives produced a total of 320 utterances, but 16 of these utterances had a *Gustar*-type psych verb and were, therefore, discarded from the analysis leaving a total of 304 utterances. The group of native speakers performed at 96 % of Absolute and Number accuracy (*SD = 6*). See Figure 4.3 above. The few errors produced by this group were all number related.

Figure 4.3: Production Task: Absolute and Number accuracy in native and child L2 learners of Spanish

The remaining utterances (i.e. 310 utterances) were scored for Absolute and Number accuracy. The accuracy scored by the learners was compared to that of the group of the native speakers. Natives produced a total of 320 utterances, but 16 of these utterances had a *Gustar*-type psych verb and were, therefore, discarded from the analysis leaving a total of 304 utterances. The group of native speakers performed at 96 % of Absolute and Number accuracy (*SD = 6*). See Figure 4.3 above. The few errors produced by this group were all number related.
They were all verbs incorrectly inflected for 3rd person singular instead of plural. Despite these errors, overall, natives were highly accurate.

Learners, on the other hand, achieved 72% of Absolute accuracy ($SD = 26$). Most errors produced by learners consisted of the use of verbs inflected for 3rd person singular rather than for 3rd person plural (51%). See examples in (34). Other non-target forms found in the children’s data were infinitive forms (35), which accounted for 15% of the errors. The use of other persons other than 3rd person was also evidenced in the learners’ data (7%) and was distributed as follows: three verbs were inflected for 1st person singular (36a) and three verbs inflected for 2nd person singular (36b). The rest of the errors were instances in which participants failed to use the appropriate mood (e.g. subjunctive) or tense (e.g. preterit). Both subjunctive (37) and preterit forms (38) were counted as errors because they were not appropriate for the context of the sentences. They summed 16% and 11% of the errors, respectively.

(34) **Number agreement error**

a. **Ellos siempre mira la TV.**
   
   they-MASC. always watch-PRES-SG the TV
   
   ‘They always watch TV.’

b. **Ellos lava la casa.**
   
   ‘they-MASC clean-PRES-SG the house’
   
   ‘They clean the house.’

(35) **Non-finite errors**

a. **Ellos siempre comer cada noche.**
   
   they-MASC. always eat-INF each night
   
   ‘They always eat.’
b. Ellos siempre jugar.
   they-MASC. always play-INF
   ‘They always play.’

(36) **Person errors**

a. Ellos siempre veo TV.
   they-MASC. always watch-PRES.1ST TV
   ‘They always watch TV.’

b. Ellos siempre bañas el perro.
   they-MASC. always bath-PRES-2ND the dog
   ‘They always bath the dog.’

(37) **Mood errors**

a. Ellos siempre tomen el basura.
   they-MASC. always take out-SUBJ. the trash
   ‘They always take out the trash.’

b. Ellos siempre duerman.
   they-MASC. always sleep-SUBJ.
   ‘They always sleep.’

(38) **Tense errors**

a. Ellos siempre comieron.
   they-MASC always eat-PRET.
   ‘They always ate.’

b. Ellos siempre limpiaron.
   they-MASC. always clean-PRET.
   ‘They always cleaned.’
Regarding Number accuracy, learners reached 79% accuracy ($SD = 23$). In other words, when calculated independently of mood and tense errors, number-agreement accuracy increased by 7% compared to Absolute accuracy. In order to compare and test whether performance in the natives and the learners was significantly different, a one-way ANOVA with Number accuracy as the dependent variable and group as the independent variable was carried out. The analysis revealed that these two groups were significantly different ($F(1,62) = 15.635, p = .000$). However, despite the fact that natives and learners were found to be significantly different, there were many learners whose accuracy was 80% or higher. See Table 4.4.
As mentioned above, the age of acquisition and time of exposure vary across learners (See Table A.1 in Appendix A). To evaluate whether these factors had an effect on performance
accuracy, learners were divided into groups and several statistical analyses were performed. Taking into account the age of acquisition reported for the participants, three groups were formed. One group included all the children who started learning Spanish at the early age of 4 \( (n = 10) \); a second group was formed by the children whose first formal exposure to Spanish was at the age of 5 \( (n = 17) \), and a third group included those who started learning Spanish at the age of 6 or 7 \( (n = 5) \). The age of 7 was reported for only one of the children; therefore, and for the purpose of the statistical analysis, this participant was included in the same group as the 6-year-olds. As shown in Figure 4.4 below, the group that did the best was the one with an age of acquisition of 5. While accuracy of the group who reported an age of acquisition of 4 years old was very similar to that of the group who reported an age of acquisition of 6 or 7 years old, neither of the two groups reached 80 percent of accuracy. The group that was exposed to the language later (i.e. 6 & 7-year-olds) was the one that showed the lowest accuracy mean.
As for testing the role played by the time of exposure, children were divided into four groups, according to the years they had been in contact with the target language: a group with two years of exposure ($n = 6$), a second group with three years ($n = 7$), a third group with four years ($n = 9$), a fourth group with five years ($n = 7$), and the last group with six years of exposure ($n = 3$). Each group included different age groups. However, there was a tendency for the youngest children to have less exposure than the oldest children. The group with only two years of exposure did especially poor (55%) when compared to the other four groups, whose accuracy percentages reached close to 80% or more (Figure 4.5 below). There was also marked differences between the children who had only two years of exposure and those who had three years. With just one more year of exposure, those with three years of exposure were 33% more accurate than those with two years of exposure.

Figure 4.4: Number accuracy percentages according to Spanish L2 learners’ age of acquisition
Figure 4.5: Number accuracy percentages according to child L2 Spanish learners’ time of exposure

In sum, the age of acquisition and the time of exposure do not seem to have a relation with learners’ accuracy producing the verbal inflection. Those who had 2-3 years of exposure performed notably different from the other groups but no significant difference was found between the five groups. However, in order to test to what degree these two factors might have made a significant contribution toward the results, a linear regression was carried out and it was found that neither the age of acquisition ($t(29) = -0.262, p > .05$) nor the time of exposure ($t(29) = 0.573, p > .05$) affected learners’ production in a significant way. In other words, these two variables were not significantly related to the learners’ performance.

Learners’ performance in individual verbs was also analyzed to know whether there were differences across verbs. In the production task, all children saw the same pictures; however,
they might use different verbs to describe the depicted actions (e.g. verbs *lavar* ‘wash’ and *limpiar* ‘clean’ were used to describe the same picture). In total, 28 distinct verbs were counted and of these, only 11 verbs have 10 or more cases. Only the verbs with 10 or more cases were included in the analysis.

These 10 verbs were used by no less than 41% (*n* = 13) of the children and by no more than 84% (*n* = 27). The verb most commonly used by the participants was *jugar* (to play) and the least commonly used was *montar* (to ride). As shown in Figure 4.6 below, children did poorer with the verb *limpiar* (to clean) and were more successful with the verb *dormir* (to sleep). This was surprising because *dormir* is an irregular verb that requires a change in the stem of the verb. For instance, the 3rd person plural of *dormir* is *duermen*. I would have expected children to show more difficulties with this verb. Indeed, there were utterances where the children produced the verb *dormir* with the incorrect stem, but they still produced it with the correct verb ending. For example five children produced the verb *dormir* with an unchanged verb stem, but with the correct inflection for person and number (e.g. dormen). No definitive explanation could be given to explain why children did as poorly as they did with the verb *limpiar* (56%). A possible explanation might be related to the phonological structure of the verb. The verb *limpiar* is the only verb that has a diphthong (i.e. rising diphthong *ia*) in the ending. Rising diphthongs in Spanish are preferred over hiatus, differing in this respect from English which shows preference for hiatus over rising diphthongs (Hualde 2005). For instance, in Spanish, the following words would be produced as *Vie-na, In-dia-na, San-Die-go*, but in English these same words would be produced with a hiatus and are heterosyllabic *Vi-en-na, In-di-a-na, San-Di-ego* (examples taken from Hualde, p. 79). This phonological difference between Spanish and English might explain
learners’ difficulties with the verb *limpiar*. However no conclusion can be drawn from the present data.

![Figure 4.6: Spanish L2 learners’ accuracy in the most used verbs in the Spanish production task](image)

In sum, the learners, although found to perform significantly different from natives, were very successful at producing the verbal inflection for 3rd person plural –*n* reaching almost 80% of accuracy. Also revealing from the results is the lack of influence of the age of acquisition and time of exposure and the participants’ responses.

### 4.5.2 Comprehension task.
A total of 18 learners completed Form A of the task and 14 completed Form B. Learners who did Form A did not differ significantly in any of the conditions from those who did Form B (singular: \( F(26, 5) = .481, p > .05 \); plural: \( F(26, 5) = .585, p > .05 \)).

In other words, learners performed similarly across task forms, in both the singular and the plural condition. Before describing in detail the results of the participants in the target sentences, their performance in the fillers will be briefly discussed as it allows us to evaluate whether learners
can identify the number of the subject when plurality was not masked or the subject was omitted. The data indicates that learners could successfully identify the number of the subject if plurality was not masked in the sentence, reaching percentages of 98% for the singular and 97% for the plural condition. The native group scored 93% and 100% for the singular and plural condition respectively. That is, it was not problematic for learners to identify the plurality of the subject when the grammatical information was available in the subject and in the verb form. On the other hand, learners were not equally successful with the null-subject stimuli. They reached a high accuracy percentage for the singular verb form (98%), but they were less successful with the plural verb form (78%). Because only one of the null-subject fillers was inflected for 3rd person plural, it might not be very informative. However, when we evaluated the accuracy in the practice items, which where all null-subject stimuli, the pattern prevailed. Learners did better in the singular condition than in the plural, reaching percentages as high as 94% for the singulare but only attaining 64% accuracy for the plural items. Such tendency was not observed in the native speakers, whose performance in the singular and plural condition did not vary so dramatically, achieving 81% and 97% respectively. Therefore, when plurality information is available in the subject (e.g. non-masked fillers), overall performance of learners is high. But when the subject is omitted (e.g. null–subject sentences), learners’ performance for the plural condition drops while remaining high for the singular condition. One question that is raised from these results is how learners will perform in a context where the subject was not omitted, but cues of plurality in the noun phrase were obscured.

Results for the sentences with masked plurality (target sentences) revealed that learners could identify plural subjects with an accuracy of 79% (SD = 26) whereas their accuracy for
singuars drops to 69% ($SD = 34$). A close look at the results shows that most learners did better with the verbs marked for 3rd person plural ($n = 15$) or achieved equal accuracy with the singular and the plural condition ($n = 8$). See Figure 4.7. There were also a few learners who did better in the singular condition than in the plural ($n = 9$). However, when both the learners who did better with in the plural condition and those who did equally well with both conditions are summed (i.e. 23 participants), it becomes evident that learners were more successful at identifying the verbs inflected for 3rd person plural than at identifying the verbs inflected for 3rd person singular. This is not surprising since the plural form of the verb is the one marked for number (i.e. –n). Does this mean that learners were sensitive to the inflection? The A’ measure would offer some insight into this matter. In order to measure children’s sensitivity an A’ measure score for each participant was calculated. The mean A’ measure across the 32 participants was of .73. Therefore their sensitivity to the inflection of 3rd person plural was above chance level.

Native speakers follow a similar pattern from that showed by learners. They were more accurate in the plural condition than in the singular. See Figure 4.7 in the next page. Indeed, they did not score percentages higher than 86%. But what about their sensitivity to the inflection and how it compares to that showed by learners? When calculated, natives’ A’ measure score was higher (.88) than that obtained for the learners (.73). To test whether the groups’ sensitivity in the target condition differed significantly, a one-way ANOVA analysis was conducted and it revealed that despite learners showing lower sensitivity to the inflection, there were no significant differences between the natives and the learners ($F = (1, 62) .301$, $p > .05$). In other words, learners and natives show similar sensitivity to the verbal inflection.
Although no significant differences were found between native speakers and learners, the group of learners was evaluated to know whether there were differences within the group of learners with regard to their time of exposure to the target language. However, because participants differed in their age of acquisition, it is appropriate to evaluate the role played by both factors to test which factor was more relevant. In order to do this, the same groups as those formed in the production task were created. To test the role of the age of acquisition, three groups were compared. See Table 4.5 in the next page. Two of the groups, the groups with ages
of acquisition of 4 years old and 6 and 7 years old, did better in the plural condition than in the singular. The group of children who started learning Spanish at the age of 5 showed almost equal scores for both the plural and the singular. The group with the oldest age of acquisition (i.e. 6 & 7 year olds) was the most successful at comprehending the inflection for 3rd person plural and identifying the plural noun phrases (91%). This group was followed by the 4-year-old group (85%) and the 5-year-old group that scored the poorest (73%). With respect to the A’ measure scores, both the 4- and 5- year old groups showed similar sensitivity whereas the 6-7 years old group exhibited the lowest sensitivity score. Despite these apparent differences in performance, a one-way ANOVA showed that there were no significant differences among the groups in their sensitivity to the inflection ($F (2, 29) = .504, p > .05$)

Table 4.5

*Accuracy percentages in the Spanish comprehension task, distributed according to Spanish L2 learners’ age of acquisition*

<table>
<thead>
<tr>
<th>Age of acquisition</th>
<th>Singular accuracy</th>
<th>Plural accuracy</th>
<th>A’ measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 ($n=10$)</td>
<td>68% ($SD = 33$)</td>
<td>85% ($SD = 25$)</td>
<td>.73</td>
</tr>
<tr>
<td>5 ($n=17$)</td>
<td>74% ($SD = 35$)</td>
<td>73% ($SD = 27$)</td>
<td>.75</td>
</tr>
<tr>
<td>6 - 7 ($n=5$)</td>
<td>52% ($SD = 39$)</td>
<td>91% ($SD = 12$)</td>
<td>.65</td>
</tr>
</tbody>
</table>

Regarding the time of exposure, participants were placed in the same five groups previously formed for the analysis of the production data. See in Table 4.6 the mean accuracies for the singular and plural items and the mean A’ measure according to learners’ time of exposure. With the exception of the group with four years of exposure, all the remaining groups
did better in the plural condition than in the singular. The children who had two or three years of exposure showed the highest accuracy average for identifying the subject when the verb was inflected for 3rd person plural, whereas those who had been exposed for four years showed the lowest accuracy percentage.

However, the A’ scores revealed that the four-year old group showed the highest sensitivity. Most groups exhibited a sensitivity of .71 or higher with the exception of the group with 6 years of exposure which showed an A’ measure score of .65. As with age of acquisition, the time of exposure did not play a significant role and in a one-way ANOVA, groups were found not to be significantly different in their sensitivity to the inflection ($F(4, 27) = .163, p > .05$).

In sum, the age of acquisition and the time of exposure do not seem to play a significant role. Nevertheless, in order to test to what degree these two factors might have made a significant contribution in the results, a linear regression was carried out and it revealed that neither the age of acquisition ($t(31) = -.436, p > .05$) nor the time of exposure ($t(31) = -.042, p > .05$) affected learners’ sensitivity in a significant way.
Table 4.6

Accuracy percentages in the Spanish comprehension task, distributed according to Spanish L2 learners’ time of exposure

<table>
<thead>
<tr>
<th>Time of exposure</th>
<th>Singular accuracy</th>
<th>Plural accuracy</th>
<th>A ‘measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 years (n = 6)</td>
<td>63% (SD = 39)</td>
<td>79% (SD = 28)</td>
<td>.71</td>
</tr>
<tr>
<td>3 years (n = 7)</td>
<td>63% (SD = 39)</td>
<td>85% (SD = 10)</td>
<td>.71</td>
</tr>
<tr>
<td>4 years (n = 9)</td>
<td>78% (SD = 34)</td>
<td>68% (SD = 30)</td>
<td>.76</td>
</tr>
<tr>
<td>5 years (n = 7)</td>
<td>63% (SD = 39)</td>
<td>74% (SD = 27)</td>
<td>.75</td>
</tr>
<tr>
<td>6 years (n = 3)</td>
<td>67% (SD = 30)</td>
<td>75% (SD = 43)</td>
<td>.65</td>
</tr>
</tbody>
</table>

Next, participants’ performance in individual verbs was evaluated. As shown in Figure 4.8 below, learners were more successful with the verb soñar (84%). They performed similarly with verbs salir, sacar, subir exhibiting an accuracy of 81% for each one. However, they did the poorest with the verb saludar reaching only 56% of accuracy followed closely by the verb silbar (59%).

Explanations as to why learners’ performance with the two verbs (i.e. saludar, silbar) was so poor might originate from two sources. First, when the responses given by the children for the verb saludar were analyzed, it was found that the singular stimulus was more problematic than the plural stimulus. Participants showed an accuracy of 44% for the singular stimulus but 75% for the plural stimulus. The sentence for the verb was Ella(s) saluda(n) al señor ‘They/she greet(s) the Mister’. There is nothing in the phonological environment of the sentence that can give us any clue as to why the item was problematic for the participants. However, learners’
performance in the verb *seguir* may offer us some insight. This verb was embedded in the sentence *Ella(s) sigue(n) a la señora* ‘They/she follow(s) the lady’. Like in the verb *saludar*, accuracy with the singular version of the verb *seguir* was very low; participants only reached 46% of accuracy while achieving an accuracy of 83% with the plural version. The verb *seguir* and *saludar* were the only items where the direct object was a human object (i.e. *señora* ‘lady’ and *señor* ‘mister’). The pictures that accompanied both stimuli showed one or two girls and a woman and a man, respectively. Having a human subject and a human object might have guided participants towards the plural interpretation. That is, learners might have been prompted to select the plural picture instead of the singular one. Regarding the verb *silbar*, the phonological context might explain learners’ performance. As it will be discussed in the section below, learners’ as well as native speakers’ comprehension might have been affected by the nasal sound found adjacent to the verb.

![Figure 4.8: L2 learners’ accuracy in the verbs used in the Spanish comprehension task](image)

**4.5.2.1 Spanish Natives’ Performance Across Task Forms.** An unexpected result was observed in the native group’s performance. To facilitate the discussion, a separate section was
devoted to the description of this result. Unexpectedly, the native speakers who completed Form A and those who completed Form B were found to be significantly different in the target items but only in the singular condition ($F(1, 30) = 4.437, p = .044$). Because items were counterbalanced across task forms, this may suggest that differences between the groups were not due to the task form per se, but might be related to the number condition of the item. In other words, learners who listened to a singular stimulus in Form A might have differed significantly from those who listened to the plural version of the stimulus in Form B. Therefore, the singular condition may be significantly more problematic to native-speakers. In order to test whether natives’ performance was indeed significantly different in the two conditions, a paired-sample T test was conducted. The result indicated that on average, natives’ performance was significantly better in the plural condition than in the singular condition ($t(31) = -2.55, p = .016, r = .42$). This result, however, was not observed in learners, whose performance in the singular and the plural condition did not differ significantly ($t(31) = -1.24, p > .05, r = .22$).

In a more detailed analysis, natives’ performance for each target item was evaluated; it was found that in four of the items (one item of Form A and three items of Form B) accuracy was especially poor for the singular condition and children interpreted them as plural. See items in (39) below. Accuracy was no higher than 59% for these items, which suggests that they were highly problematic for the native speakers. Moreover, when these four items are removed from the analysis, the group that completed Form A and the one that completed Form B are no longer significantly different. The question that is raised, then, is why these items were so problematic for the native speakers.
a. Ella sueña con una oveja. Target 1 Form A
   ‘She dreams of a sheep.’

b. Ella sigue a la señora. Target 2 Form B
   ‘She follows the lady.’

c. Ella sopla las velas del pastel. Target 3 Form B
   ‘She blows the candles of the birthday cake.’

d. Ella silba en la oficina. Target 10 Form B
   ‘She whistles in the office.’

Stimulus in (39a) might have been problematic to natives because in Spanish a vowel that
follows a nasal (e.g. ñ) may become nasalized. Spanish speaking children might have perceived a
nasal sound at the end of the verb sueña, incorrectly interpreting the stimulus as plural rather
than singular. In (39d), there is contiguous nasal sound in the preposition en that follows the verb
silba. In connected speech, this might have led natives to the incorrect impression that the verb
was inflected for 3rd person plural. Although the adjacent phonologic context may help explain
the native speakers’ performance in 39a and 39d, this same explanation could not account for
natives’ poor performance in the other two items in 39b and 39c. With the goal of finding a
possible explanation for natives’ performance, I evaluated learners’ performance in the same
four items and compared them to the natives. See Figure in 4.9. Results showed that learners
outperformed native speakers in the four items. The items where the phonologic context seems to
have played a role were the ones where learners showed greater advantage (i.e. T1 and T10). These results suggest that natives’ performance may be related to the way they segmented speech, however a more detailed explanation about participants’ performance in these items will be presented in Chapter 6 (i.e. Conclusions and Discussion).

Figure 4.9: Native speakers’ and learners’ performance in target items 1, 2, 3 and 10

**4.5.3 Production Versus Comprehension.** One of the questions that this study aims to address concerns the relation between learners’ performance in the production task and that of the comprehension task, as well as whether they perform similarly across modalities. When natives’ performance across tasks was evaluated, it was found that they performed better in the production task than in the comprehension task. For the purpose of comparing learners performance across tasks, individual A’ measure scores and accuracy scores in production were compared.
In the production task, natives’ accuracy was no lower than .80, but in the comprehension task, they showed more variation and their sensitivity ranged from 0.51 to 1. As for the learners, results revealed that learners’ performance in production range from .20 to 1. The range in A’ measure scores was comparable to that showed by natives (0.50 - 1). As a group, learners showed a score of .79 in production and they were found to perform significantly different from the natives. On the other hand, in the comprehension task, learners’ mean sensitivity was of .73 and they did not differ significantly from natives.

However, it is important to note that when results were evaluated individually, not all children were found to be equally successful in production and comprehension. Instead three patterns were shown in learners. For determining whether the children did better in one of the tasks or equally well across tasks, the following criteria was used: If the participant’s accuracy was .10 points higher in the production task or the A’ measure score, then it was considered that this learner performed better in one of the tasks; however, if the difference in accuracy was lower than .10 in any of the tasks, then it was determined that the participant performed equally well across modalities. For example, if a participant got .90 in the production task but scored .79 in sensitivity, then he was considered to have done better in the production task. If instead he had .20 in production but a score of .80 in sensitivity, then he was classified to have done better at comprehending the inflection than at producing it. Finally, if the child’s accuracy in production was .90 in production and he showed a score of .95 in comprehension, then he was considered to have performed equally across tasks.

The individual results from the native speakers revealed that for most natives (\( n = 22 \)) scores in the production task were higher than their sensitivity scores in the comprehension task.
Eight participants showed similar scores across language modalities and just one child showed higher scores in comprehension than in production (.90 in production and .1 in comprehension). As shown in Figure 4.10 below, it is evident that there was some asymmetry between production and comprehension. However, asymmetry comes mainly from one direction. Children are better at producing the inflection than at comprehending it. This was somehow expected because in the L1 acquisition literature, it has been reported that children may have difficulties identifying the number when cues of plurality are obscured in the subject. Nevertheless, it is important to notice that none of those children who showed the highest sensitivity score (i.e. score of 1) showed accuracy lower than 90% in production. However, the two children who showed the lowest accuracy in production (80%) also showed low sensitivity scores (.56 and 0). These findings suggest that children can be very successful at producing the inflection regardless (to some extent) of their sensitivity to the inflection. However, if they do show high sensitivity to the inflection they will tend to be highly successful at producing the inflection. Results also suggest that if they show some difficulties in production, their sensitivity to the inflection may also be low.
In contrast to the native speakers, in the learners there was not a clear tendency and three patterns were observed. Some learners did better in production ($n = 13$). Others scored equally across tasks ($n = 11$) while a minority ($n = 8$) scored higher in sensitivity than in production. That is, taken together, most learners either were better in production or performed equally well in both tasks. See Figure 4.11. When individual results are looked at closely, it becomes evident that those learners who showed high sensitivity to the inflection also showed high accuracy in production. Indeed, all the learners that scored 1 in sensitivity ($n = 5$), with the exception of one child who scored of .60 in production, performed at ceiling in the production task and produced the inflection in all the occurrences. However, a high score in sensitivity did not necessarily guarantee a high level of performance in production. For instance, there was a child who got a score of .20 in production but still showed a score of .80 in sensitivity.
Nevertheless, although a clear pattern did not emerge, overall, it seems that once the child showed perfect sensitivity, he will most likely show target-like performance in production. The reverse situation is not observed; that is, if a child scored perfect in production, he or she will not necessarily show high sensitivity scores. In other words, learners may master the inflection in production before they are able to do it in comprehension, but once they master it in comprehension, they will most likely command it in production. Refer to Appendix A to see the results for each participant.

Although there seems not to be a strong relation between learners’ scores in production and comprehension, to ascertain whether learners’ performance in production and comprehension was correlated, a Pearson’s analysis was conducted. The analysis showed that
performance in both tasks modalities was not significantly correlated ($r (32) = .044, p > .05$). Therefore, there is no correlation between learners’ performance across tasks.

4.6. Summary

To summarize, the main findings on Spanish child L2 learners’ performance in production and comprehension are outlined below:

- In the group results, learners show high, although not native-like, accuracy in producing verbal morphology. Deduced from the individual results was the fact that some learners did perform at 100% ($n = 11$) accuracy, thus performing at a native-like level. Indeed, most learners ($n = 20$) were within the range of the natives speakers (i.e. between 80% and 100% of accuracy.)

- In the comprehension task, learners were successful at identifying the number of the subject when this grammatical information was not obscured and was easily available for them in the subject (plural –s) as well as in the verb (i.e. non-masked and null-subject fillers). However, they were less successful at identifying the subjects when this was omitted and the verb was inflected for 3rd person plural.

- Learners were relatively successful at identifying the subject of the sentence when the only reliable cue available was the verb ending, and their sensitivity to the inflection was not significantly different from that of natives. Therefore, learners were not only able to identify the number-agreement when they had multiple cues (i.e. non-masked sentences) but also to take advantage of the verbal inflection when it was the single reliable cue of plurality.
Moreover, they outperformed the native children in some of the items.

Learners’ age of acquisition and time of exposure did not play a significant role in their performance in either production or comprehension.

As shown by the results described in this chapter, child L2 learners of Spanish are able to reach high levels of performance in production as well as in comprehension. Learners’ accuracy in production was close to 80%. In fact 63% of the learners performed at 80% accuracy or above which may be taken as evidence of their advanced linguistic knowledge of the verbal inflectional system of Spanish. In comprehension, learners and native speakers performed similarly and no significant difference was found between the groups. Thus, child L2 learners of Spanish are capable of distinguishing between sentences that differ minimally by the presence (i.e. 3rd plural $-n$) or the absence of the verbal inflection (i.e. 3rd person singular) at a native-like level. This suggests that features of verbal inflection are part of the learner’s L2 grammar. In other words, it indicates that this part of the child L2 learner’s grammar is not impaired.

Also revealed in this chapter is the lack of relationship between participants’ performance in production and their performance in comprehension. The results showed that either language modality could precede the other. That is, participant could perform better in production or comprehension. In both, natives and learners asymmetry was observed. Regarding the asymmetry observed in the natives, the L1 literature has found that production may precede comprehension. For instance, researchers have related children’s failure to identify the number of the subject to their metalinguistic knowledge. The comprehension task might have been a demanding task in the sense that the child had to attentively listen to the stimuli in order to correctly identify the subject. Unlike other linguistic operations that are generally carried out
automatically, namely language production, metalinguistic operations require a great deal of attention from the speaker and rely upon whether the speaker chooses to engage in such activity (Tunmer & Herriman 1984). Attentional abilities are known to be limited in children because they tend to have short attention spans (Levy 1980; Betts, Mckay, Maruff & Anderson 2006).

Similar explanations could be extended to account for learners’ performance. Those learners who performed better at the production task showed a similar pattern as that observed in the natives. Both learners and natives showed high accuracy in production regardless of the sensitivity scores. This may be related to the nature of the task. A follow-up study that tests adults may offer some insight to this matter. Such a study will ascertain whether adult L2 learners, who have greater metalinguistic knowledge, show similar dissociations between production and comprehension. As for those who showed high sensitivity scores, they tended to also show high accuracy in production. This was true for both natives and learners. In sum, for most learners and natives, production seems to precede comprehension, but results also suggest that once mastered in comprehension, the speaker will be more likely to be target-like in production.

In the next chapter (i.e. Chapter 5) the English experiments will be presented. Similar to the present chapter, the methodology as well as the procedure followed for the production and the comprehension tasks will be described. The results for both tasks will be also described.
CHAPTER 5
ENGLISH EXPERIMENTS

The previous chapter on the Spanish experiments described the production and comprehension of the Spanish 3rd person plural in learners of Spanish and native speakers. As stated previously, one of the goals of this study is to examine whether crosslinguistic differences found between target languages have an effect on morphological acquisition. In particular, it aims to find whether and to what degree the richness of the verb morphological system of the target language plays a role in the rate of acquisition. In the literature, it has been proposed that in poorly inflected languages, like English, the learner would have fewer opportunities to access her morphological knowledge than a learner acquiring a highly inflected language. The opportunities the learner has to access her knowledge promote morphological acquisition by speeding up the automatization of morphological processing. Following this proposal, it is predicted that it will take longer for learners of a poorly inflected language to master the verbal morphology of the target language.

This study also intends to evaluate learners’ performance in production and comprehension and its relationship with learners’ linguistic knowledge. Both comprehension and production are assumed to be two distinct processes that impose different demands on the speaker. However, it is also generally assumed that a common grammar underlies both processes. Therefore, when a learner produces or comprehends a sentence, she is using the same linguistic knowledge in both of these processes. There are two main views regarding L2 learners’ performance. One view (i.e. impairment approach) holds that learners’ lack of success derives from their lack of grammatical knowledge of the target language. According to this view,
functional features like T and Agr are not available to L2 learners and, because of this, learners are not able to achieve target-like performance. The second approach, on the other hand, argues that learners’ competence is not impaired. Instead, it maintains that learners have access to L2 functional features, like Agr and T, and variability results from a processing problem. If we assume that the speaker uses a common underlying grammar for production and comprehension, this will allow us to make some predictions about the grammatical knowledge of the learner. If grammatical representations are absent from the learner’s grammar, as posed by the impairment approach, then the grammatical deficit should have an effect on both production and comprehension. That is, the learner’s performance will be similar across modalities. However, if only one modality is found to be affected, that is if the learner shows asymmetry between her performance in production and comprehension, this will be evidence against the impairment view.

In order to attain the study’s objectives and to address the research questions posed in this study, a group of child L2 learners learning a poorly inflected language was tested. To analyze verbal morphology acquisition in a poorly inflected language, morphological knowledge in child L2 learners of English was evaluated. Two experiments were designed to assess the children’s knowledge. The experiments examined the production and comprehension of the English 3rd person singular –s.

This chapter is organized as follows. First, the participants who completed the English tasks are described. Then, the tasks used to assess children’s knowledge of 3rd person singular –s are describe along with the analysis to evaluate their responses. Next, the procedure used in the
administration of the tasks is discussed. Finally, at the end of the chapter the results for the English tasks are presented and a summary of the main findings is given.

5.1 Participants

Most of the English L2 learners tested for the English tasks were the same as those who served as the control group for the Spanish tasks. Only one of the children included in that group was not included in the English L2 data. This child was not included because information about his L2 linguistic background was not offered. To have the same number of participants in both the native speakers and learners groups, the data of a child who was not a participant in the Spanish experiments was included in the analysis. The English native group, on the other hand, was formed from all of the children who served as the experimental group in the Spanish tasks. Therefore, the group of native English-speaking children as well as the English L2 learners’ group included 32 participants. At the time of testing (Summer 2011), all the English learners were enrolled in an English early total immersion program at a school in San Juan, Puerto Rico. The children’s age ranged from 7;7 to 9;9 years old with a mean of 8;9 years. The age distribution of the children is shown in the Table 5.1:

Table 5.1
Age Distribution of the L2 learners of English

<table>
<thead>
<tr>
<th>Age of participants (years;months)</th>
<th>Number of participants (N = 32)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7;7 – 7;11</td>
<td>7</td>
</tr>
<tr>
<td>8;0 – 8;11</td>
<td>15</td>
</tr>
<tr>
<td>9;1 – 9;9</td>
<td>10</td>
</tr>
</tbody>
</table>
A questionnaire about the child’s linguistic background was sent home for parents to fill out. All children were reported to be native speakers of Spanish and to speak this language at home. Most of the children had not lived in any country other than Puerto Rico ($n = 31$). Only one child was reported to have been born in the United States, but her parents moved back to Puerto Rico when she was only 1 year old and since then, they have only lived in Puerto Rico. The mean age of English acquisition for the learners was 4.3 years old. All of these children started learning English when they started pre-k or kindergarten at the age of 4 or 5, respectively. The time of exposure to the target language ranged from two to five years with mean years of exposure of 3.9 years. See Table 5.2 for the distribution of the participants according to the age at which they started learning English and to the time (years) they reported to be exposed to the target language.
Table 5.2

*English L2 learners' individual linguistic background*

<table>
<thead>
<tr>
<th>Participant</th>
<th>Gender</th>
<th>Age (years; months)</th>
<th>AoA</th>
<th>ToE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F</td>
<td>7;7</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>7;10</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>7;11</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>F</td>
<td>7;11</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>F</td>
<td>7;11</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>F</td>
<td>8;0</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>M</td>
<td>8;0</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>M</td>
<td>8;2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>F</td>
<td>8;3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>F</td>
<td>8;4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>11</td>
<td>F</td>
<td>8;5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>12</td>
<td>M</td>
<td>8;5</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>13</td>
<td>M</td>
<td>8;5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>14</td>
<td>M</td>
<td>8;6</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>15</td>
<td>F</td>
<td>8;7</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>16</td>
<td>F</td>
<td>8;8</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>17</td>
<td>F</td>
<td>8;9</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>18</td>
<td>F</td>
<td>8;10</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>19</td>
<td>F</td>
<td>8;11</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>20</td>
<td>M</td>
<td>8;11</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>21</td>
<td>M</td>
<td>8;11</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>22</td>
<td>M</td>
<td>8;11</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>23</td>
<td>F</td>
<td>9;1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>24</td>
<td>F</td>
<td>9;1</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>25</td>
<td>F</td>
<td>9;3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>26</td>
<td>M</td>
<td>9;6</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>27</td>
<td>F</td>
<td>9;8</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>28</td>
<td>F</td>
<td>9;8</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>29</td>
<td>M</td>
<td>9;9</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>30</td>
<td>M</td>
<td>9;9</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>31</td>
<td>M</td>
<td>9;9</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>32</td>
<td>F</td>
<td>9;9</td>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>
The control group was formed by the 32 English-speaking children who were the experimental group in the Spanish tasks. Their ages ranged from 7;5 to 10;11 years old with a mean age of 9;0 years. See Table B.2 in Appendix B for individual information about the native speakers’ age. The natives and the learners were age-matched and no significant difference was found between the group’s ages ($F(1,62) = 1.483, p > 0.5$). At the time of testing (Spring 2012), The English native speakers were enrolled in a Spanish early total immersion program at a school in Michigan. A questionnaire about the child’s linguistic background was sent home for parents to fill out. All children were reported to be native speakers of English, to speak this language at home, and not to have lived in any country other than the United States.

5.2 English Production Task

To elicit children’s knowledge of the English 3rd person singular –s, a picture description task was used. The pictures were in color and drawn on medium-size index cards. They showed a boy doing activities such as cleaning, reading, and playing (Figure 5.1). The pictures used in the English production task were different from those used in the Spanish tasks. The pictures in the English tasks were of a single subject while in the Spanish task pictures, pictures depicted two subjects (i.e. a boy and a girl). With the aim of eliciting a variety of verbs and of assuring that participants’ responses were not limited to the use of the present progressive, participants were prompted to use simple present tenses. They were instructed to describe the pictures using structures such as *He always*... or similar structures. The task included 2 practice items and 10 target items. Participants’ responses were recorded, transcribed and coded.
5.2.1 Analysis: Production Task. To analyze the children’s responses in the production task, it was evaluated whether verbs were correctly inflected for 3rd person singular (i.e. Number accuracy). Unlike Spanish, English is only inflected for number in the present tense and only for 3rd person singular. If a child, for example, produced a verb form in the past tense, which is the other tense marked with an affix, it would not be possible to evaluate number accuracy. Hence, if a child produced a verb form other than the present tense, this was not included in the analysis. Also, because I was mainly interested in the acquisition of 3rd person singular –s, progressive forms were also discarded from the analysis. To measure children’s overall accuracy, their proportion of correctly inflected forms was calculated out of the total forms produced in the simple present tense. For instance, if a participant produced eight verb forms in the present tense and she correctly supplied the inflection –s in six out of the eight forms, then she would receive an accuracy of .75.

5.3 English Comprehension Task

To elicit children’s knowledge of the English 3rd person singular-s, the sentences included in the picture-choice comprehension task created by Johnson, de Villiers and Seymour.
(2005) were used. The pictures that accompanied each sentence were created for the purpose of the present study. In the original task, pictures were shown in pairs (i.e. one single object picture and one plural object picture); however, in the present experiment pictures were presented in sets of three (i.e. one single object picture, one plural object picture, and a distractor). The distractor picture was included to test whether children understood the meaning of the sentence they heard and whether they were paying attention to the stimulus. The target sentences in this task were designed to evaluate children’s knowledge of the verbal inflection by accessing their capacity to use it, as the sole reliable cue to identify the number of the subject. In the experiment, the plural marker in the noun phrase was disguised by using verbs that started with an /s/. See examples in (40). The task included 3 practice items, 10 target items and 9 filler items. Six of the fillers were not included in the original task of Johnson, de Villiers and Seymour but were created for the purpose of the present study.

(40) a. The cat sleeps on the bed.

b. The cats sleep on the bed.

All the sentences included in the task were recorded by an English native speaker who was instructed to read the sentences at a natural speech rate and not to pause between the subject and the verb of the sentence. In natural connected speech, English speakers would not pause between the noun phrase and the verb. And in sentences like the ones included in the experiment, both the –s of the noun phrase and the s- of the verb would merge into one sound and, thus, not contain reliable cues for word boundaries. In this way, participants were forced to use the verbal inflection to correctly identify the number of the subject of the sentence. However, there may be subtle prosodic cues to singular and plural in the boundary between the noun and the verb. In
norming the task, it was found that adult native speakers were able to correctly identify the number of the pronoun with an accuracy of 57% for the singular and 46% for the plural when just the segment containing the pronoun and the first syllable of the verb was played (i.e. not including the verb ending). For each of the target sentences, a singular and plural version was recorded. The pre-recorded stimuli were presented to participants along with a group of pictures. See example in Figure 5.2. Pictures were shown to participants in groups of three on a computer screen. One picture had a single person or animal performing an action, a second picture showed two subjects performing the same action as the single-subject picture and a third picture was included as a distractor. The distractor showed either a single subject or two subjects performing a completely different action.

Figure 5.2: Example of the English comprehension task. This group of pictures was presented along with the stimuli.

The three practice items, as well as three of the fillers of the experimental section, were sentences formed with the present progressive. The English progressive is formed with the auxiliary *be* and the *ing* form. Auxiliary *be* takes suppletive verbal forms and the singular and plural form of 3rd person are completely different (e.g. the girl is taking a nap vs. the girls are
taking a nap), therefore, speakers could easily identify the subject of the sentence by the form of the verb regardless of whether the subject has a mark for plurality. For all three of these sentences, only one version of the sentence, either singular or plural, was created. The remaining six fillers (not included in the original task design) were sentences where the plurality of the noun phrase was not masked (e.g. The boy writes a letter). Like in the target sentences, only lexical subjects were used. For each of these six sentences (non-masked fillers, henceforth) a singular and plural version was recorded.

Two forms of the task were created: Form A and Form B. Each form included 22 items (3 practice items, 10 target items and 9 fillers). The target and the non-masked filler sentences were counterbalanced between each. Therefore, each task form included one practice section that was the same in both forms and which included: two singular stimuli and one plural stimulus; and an experimental section that included 10 target sentences (five singular and five plural stimuli) all counterbalanced, six non-masked filler sentences (three singular and three plural stimuli) all counterbalanced and three auxiliary be filler sentences (two singular stimuli and one plural stimulus) that were the same in both forms. Table 5.3 includes some example sentences and their distribution in the task forms.

Table 5.3

<table>
<thead>
<tr>
<th>Task Form</th>
<th>Target Items ( (N = 10, \text{5 sg. 5 pl.}) )</th>
<th>Non-masked items ( (N = 6, \text{3 sg., 3 pl.}) )</th>
<th>Present progressive items ( (N = 3, \text{2 sg., 1 pl.}) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form A</td>
<td>The elephants spill the paint.</td>
<td>The girl plays soccer.</td>
<td>The lady is talking on the phone</td>
</tr>
<tr>
<td>Form B</td>
<td>The elephant spills the paint.</td>
<td>The girls play soccer.</td>
<td>The lady is talking on the phone</td>
</tr>
</tbody>
</table>
5.3.1 Analysis: Comprehension Task. As in the Spanish task, accuracy and sensitivity were also measured for the English comprehension task. For accuracy, a child received a score of 1 if she pointed to the right picture and a score of 0 if she selected the incorrect one. Therefore, each participant could receive a total score ranging from 0 to 10 in the target items (5 points for the singular noun phrases and 5 points for the plural noun phrases). However a participant might also choose the distractor pictures or might not choose any picture. For example, if presented with a singular stimulus, four responses might have been expected from the child:

a. The child might correctly choose the singular-subject picture (e.g. the child chooses the picture of one cat sleeping when the sentence is *The cat sleeps on the bed*).

b. The child might incorrectly choose the plural-subject picture (e.g. the child chooses the picture of two cats sleeping on the bed when the sentence is *The cat sleeps on the bed*).

c. The child might incorrectly choose the distractor picture (e.g. the child chooses the picture of two awake cats sitting on chairs when the sentence is *The cat sleeps on the bed*).

d. The child might not give any response. She might not point to any picture.

If the child’s response was *a*, that is, if the child pointed to the correct picture, then she received one point. However, if the child selected a singular subject picture when the stimulus is plural (i.e. case *b*), then she received a zero. If instead of choosing either the plural or singular version of the stimulus she heard, the child pointed to the distractor or did not point to any picture, these responses were not included in the general analysis, as they may indicate that the child was not paying attention or that she did not understand the sentence. To measure the child’s
accuracy in the singular and plural condition, her proportion of correct answers in the singular and plural items was quantified as follows. For example, if out of the five singular items the child correctly identified only one item, incorrectly identified three items and pointed to the distractor in the remaining item, then the proportion of correct answers for the singular condition was divided between the total of responses not including the distractor response (i.e. one correct response/four valid responses = 0.25 accuracy).

As with the Spanish comprehension task, participants’ sensitivity to the inflection was also measured. In order to measure sensitivity, A’ measure scores were calculated following the equation described and illustrated in Chapter 4. Please refer to section 4.3.1.

5.4 Procedures

The tasks were administered individually in the library of the school. All the learners completed the Spanish tasks (i.e. their L1) first and later they completed the English tasks (i.e. their L2). As described previously in the Spanish experiments, the administration of the tasks was separated by language and were given to the children at different times of the same day with approximately two to three hours between each.

All children, the native speakers and the learners, completed the production task first and later completed the comprehension task. Instructions were given in the language in which they were to be tested in order to maintain consistency with regards to the language mode in which they were being tested. However, if the child appeared to be more comfortable speaking in her native language, the experimenter gave the instructions in the child’s first language. Some children feel very comfortable expressing themselves in the second language, however, there are others who prefer to use their first language. In the production task, children were instructed to
describe the action represented in the pictures by using phrases like “He always…” or any phrase that indicated that the actions represented were done habitually by the character in the picture. In this way, children were encouraged to use the simple present tense. Most of the time this worked and they completed the phrase using the simple present tense. Children were also instructed that if they were not sure about what verb to use to describe the picture, they could use any verb they thought was appropriate and that any response they gave would be acceptable. Positive feedback was given to the children regardless of whether they supplied the correct verb form.

As for the comprehension task, children were asked to put on a set of headphones and were told to listen carefully to each sentence and to point to the picture they thought had been described. They were also told that they could listen to the sentence as many times as they would like.

5.5 Results

5.5.1 Production Task. The total number of utterances analyzed for the English learners was 308. Although all the children had the chance to describe 10 target pictures, not all of them provided a description for all the pictures or produced a verb in the simple present tense. There were three instances in which no answer was offered by the participants; verb tenses other than the simple present tense were produced in nine of the instances and were distributed as follows: past (n = 1), present progressive (n = 5), future (n = 2) and auxiliary do (n = 1).

Learners’ performance at producing the verbal inflection for 3rd person singular was relatively poor, reaching only 58% (SD = 42) of accuracy (range 0%-100%), whereas natives scored 98% (SD = 5) with a range of accuracy between 80 to 100 percent. A total of 15 learners fell within the range of the native speakers, while 11 learners were at chance or below chance
level. The remaining learners ($n = 6$) were above chance level but below 80% of accuracy. See Figure 5.3.

The rate of accuracy varied greatly across learners. See individual results for the English production task in Table 5.4. Some learners were highly accurate, producing the 3rd person –s in all the utterances, whereas there were others whose omissions of verbal inflection was variable or even categorical, not producing the affix in any of the verb forms.
Table 5.4

**English L2 learners' individual results for the English production task**

<table>
<thead>
<tr>
<th>Participant</th>
<th>Gender</th>
<th>Age</th>
<th>AoA</th>
<th>ToE</th>
<th>English Production task</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F</td>
<td>7;7</td>
<td>4</td>
<td>3</td>
<td>89%</td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>7;10</td>
<td>4</td>
<td>4</td>
<td>30%</td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>7;11</td>
<td>4</td>
<td>3</td>
<td>70%</td>
</tr>
<tr>
<td>4</td>
<td>F</td>
<td>7;11</td>
<td>5</td>
<td>2</td>
<td>0%</td>
</tr>
<tr>
<td>5</td>
<td>F</td>
<td>7;11</td>
<td>4</td>
<td>4</td>
<td>38%</td>
</tr>
<tr>
<td>6</td>
<td>F</td>
<td>8;0</td>
<td>4</td>
<td>4</td>
<td>0%</td>
</tr>
<tr>
<td>7</td>
<td>M</td>
<td>8;0</td>
<td>5</td>
<td>3</td>
<td>90%</td>
</tr>
<tr>
<td>8</td>
<td>M</td>
<td>8;2</td>
<td>4</td>
<td>4</td>
<td>100%</td>
</tr>
<tr>
<td>9</td>
<td>F</td>
<td>8;3</td>
<td>4</td>
<td>4</td>
<td>63%</td>
</tr>
<tr>
<td>10</td>
<td>F</td>
<td>8;4</td>
<td>4</td>
<td>4</td>
<td>90%</td>
</tr>
<tr>
<td>11</td>
<td>M</td>
<td>8;5</td>
<td>5</td>
<td>3</td>
<td>89%</td>
</tr>
<tr>
<td>12</td>
<td>M</td>
<td>8;5</td>
<td>4</td>
<td>4</td>
<td>100%</td>
</tr>
<tr>
<td>13</td>
<td>F</td>
<td>8;5</td>
<td>4</td>
<td>4</td>
<td>44%</td>
</tr>
<tr>
<td>14</td>
<td>M</td>
<td>8;6</td>
<td>4</td>
<td>4</td>
<td>0%</td>
</tr>
<tr>
<td>15</td>
<td>F</td>
<td>8;7</td>
<td>4</td>
<td>4</td>
<td>50%</td>
</tr>
<tr>
<td>16</td>
<td>F</td>
<td>8;8</td>
<td>5</td>
<td>3</td>
<td>90%</td>
</tr>
<tr>
<td>17</td>
<td>F</td>
<td>8;9</td>
<td>4</td>
<td>4</td>
<td>100%</td>
</tr>
<tr>
<td>18</td>
<td>F</td>
<td>8;10</td>
<td>4</td>
<td>4</td>
<td>80%</td>
</tr>
<tr>
<td>19</td>
<td>M</td>
<td>8;11</td>
<td>4</td>
<td>4</td>
<td>100%</td>
</tr>
<tr>
<td>20</td>
<td>F</td>
<td>8;11</td>
<td>4</td>
<td>4</td>
<td>80%</td>
</tr>
<tr>
<td>21</td>
<td>M</td>
<td>8;11</td>
<td>4</td>
<td>5</td>
<td>100%</td>
</tr>
<tr>
<td>22</td>
<td>M</td>
<td>8;11</td>
<td>4</td>
<td>5</td>
<td>60%</td>
</tr>
<tr>
<td>23</td>
<td>F</td>
<td>9;1</td>
<td>4</td>
<td>5</td>
<td>13%</td>
</tr>
<tr>
<td>24</td>
<td>F</td>
<td>9;1</td>
<td>5</td>
<td>4</td>
<td>60%</td>
</tr>
<tr>
<td>25</td>
<td>F</td>
<td>9;3</td>
<td>4</td>
<td>5</td>
<td>20%</td>
</tr>
<tr>
<td>26</td>
<td>M</td>
<td>9;6</td>
<td>4</td>
<td>5</td>
<td>20%</td>
</tr>
<tr>
<td>27</td>
<td>F</td>
<td>9;8</td>
<td>4</td>
<td>5</td>
<td>70%</td>
</tr>
<tr>
<td>28</td>
<td>F</td>
<td>9;8</td>
<td>5</td>
<td>3</td>
<td>0%</td>
</tr>
<tr>
<td>29</td>
<td>M</td>
<td>9;9</td>
<td>5</td>
<td>4</td>
<td>90%</td>
</tr>
<tr>
<td>30</td>
<td>M</td>
<td>9;9</td>
<td>5</td>
<td>4</td>
<td>100%</td>
</tr>
<tr>
<td>31</td>
<td>M</td>
<td>9;9</td>
<td>5</td>
<td>4</td>
<td>80%</td>
</tr>
<tr>
<td>32</td>
<td>F</td>
<td>9;9</td>
<td>5</td>
<td>4</td>
<td>0%</td>
</tr>
</tbody>
</table>
Native speakers produced 320 utterances, but 12 verb forms were present progressive forms, therefore, they were discarded from the analysis leaving a total of 308 utterances. The group of native speakers performed almost at ceiling \((SD = 5)\). When learners’ accuracy was compared to that of the native English speakers, it was not surprising to find that these two groups were significantly different \((F(1, 61) = 32.977, p = .001)\).

Learners’ overall accuracy was poor when evaluated in groups. According to their age of acquisition and time of exposure, the analysis revealed that learners performed similarly across groups despite the age at which they formally started learning English or the amount of time they had been exposed to the language. In order to test the effect of the age of acquisition in learners, two groups were formed. One group included all the children who started learning English at the age of 4 \((n = 22)\), while a second group included the children whose formal exposure to English began at the age of 5 \((n = 10)\). The analysis of these two groups showed that those children who started learning English at the age of 4 were less accurate \((SD = 38)\) than those who started at the age of 5 \((SD = 34)\). See Figure 5.4 below. However, when a one-way ANOVA was performed to test whether indeed these groups were significantly different, it was found that performance in the groups was not significantly different \((F(1,30) = .550, p > .05)\).
Figure 5.4: Accuracy percentages in the English production task according to English L2 learners’ age of acquisition

Learners were also divided in groups according to the years they had been exposed to English. Three groups were formed. Group one included the children who had been exposed to English for two or three years \((n = 7)\). Because there was only one child who was reported to have only two years of exposure, he was included in the same group as those children who have at least three years of exposure. Nevertheless, the other two groups included children with a time of exposure of either four \((n = 19)\) or five years \((n = 6)\). See Figure 5.5. Children’s age within the three groups varied. In the 2 & 3 and the 4 years groups, children’s age range from 7;7 to 9;6 years old. In the 5 years group, children’s age range from 7;11 to 9;9 years old. The results showed that those who had two to three years or four years of exposure did equally well, both reaching 64% accuracy \((SD = 35\) and 40, respectively). Surprisingly, the group of children who had more years of exposure (i.e. 5 years) was less successful than the other two groups, only showing an accuracy of 43% \((SD = 35)\). Despite the differences between the 5 years-group and
the other two groups, a one-way ANOVA analysis revealed that there were not significant differences between the groups ($F(2, 29) = 1.052, p > .05$) In sum, the age of acquisition and the time of exposure do not seem to have played a significant role in learners’ accuracy producing the verbal inflection. However, in order to test and ascertain to what degree these two factors might have made a significant contribution in learners’ performance, a linear regression was carried out. The analysis revealed that neither the age of acquisition ($t (29) = .903, p > .05$) nor the time of exposure ($t (29) = -.026, p > .05$) had any significant relationship with learners’ production in a significant way.

![Figure 5.5: Accuracy percentages in the production task, according to English L2 learners’ time of exposure](image)

Figure 5.5: Accuracy percentages in the production task, according to English L2 learners’ time of exposure

Next, I looked at the participants’ performance in individual verbs. To know whether learners performed differently across verbs, I first counted all the verb forms used by them. As
with the Spanish production, only the verbs that had 10 or more instances were included in the analysis. The list of the verbs included can be found in Figure 5.6 below.

These verbs were used by no less than 31% (n = 10) of the children and by no more than 84% (n = 27). The verb that was most commonly used by the participants was *play* and the least commonly used were *bake* and *vacuum*. As shown in Figure 5.6 below, children did poorer with the verb *bake* and were more successful with the verb *vacuum*. Learners’ high accuracy percentage in the verb *vacuum* and low accuracy percentage in the verb *bake* might have been related to the small number of participants who used the verbs. Both verbs were only used by 10 of the participants while the others were used by 24 or more participants. If these verbs were to have had a larger sample of participants, the percentages for each verb might have been different.

![Figure 5.6: English L2 learners’ accuracy in the most used verbs in the English production task](image)

A factor that has been claimed to affect L2 learners’ morphology production is the differences between the learner’s L1 verbal prosodic structure and that of the L2. The verbal prosodic structure of Spanish and English verbs is different. In Spanish the inflection is included
within the prosodic structure of the verb (Alers-Valentín 2000; Nuñez Cedeño & Morales-Font 1999) while in English, it is affixed to it (Goad & White 2006). According to the PTH, Spanish speakers learning English as L2 are expected to have difficulties producing verbal morphology. The PTH predicts that Spanish speakers will use reparatory strategies to accommodate the prosodic structure of English, relying on the prosodic they have available from their L1. Because of these strategies, learners are expected to show an asymmetry between short stem verbs (e.g. -VC) and long stem verbs (e.g. -VVC). Learners are expected to be more successful with the former phonological structure (i.e. short-stem). The design of this study was such that it did not allow to test this prediction directly. Children described pictures depicting a specific action but they could use any verb. In no way were long-stem and short-stem verbs intentionally elicited. In order to evaluate the predictions made by the PTH, the verbs that had 10 or more instances were analyzed. That is, the verbs included in Figure 5.6 above were analyzed. Out of the nine verbs, five had short-stems: \textit{play} [pleɪ], \textit{read} [riːd], \textit{cut} [kʌt], \textit{clean} [kliːn], and \textit{talk} [tɔːk]; and four were long-stem verbs: \textit{ride} [raɪd], \textit{drink} [drɪŋk], \textit{bake} [beɪk], and \textit{vacuum} [ˈvækjuəm]. When the two types of verbs are compared, there seems not to be asymmetry between short-stem and long-stem verbs. Indeed, the highest accuracy percentage was achieved with a long-stem verb (i.e. \textit{vacuum} [ˈvækjuəm]). However, it is true, as well, that the lowest accuracy was found for a long-stem verb (i.e. \textit{bake} [beɪk]). Therefore, the phonological structure of the verb does not seem to predict the learners’ production of verbal morphology.

The PTH also argues that a PWd-internal analysis is possible in phonological contexts where the inflection is syllabified to the adjacent sound. This process (i.e. resyllabification) takes place when the inflection is followed by a word that starts with a vowel (e.g. \textit{sleeps on}}
Learners are expected to be more successful in resyllabication contexts than in contexts where resyllabication does not take place (e.g. sleeps for [sli:pzə.n]). With the aim of testing whether resyllabication facilitates the production of the inflection in English L2 learners, I evaluated all the utterances produced by the learners (i.e. 308). The utterances were divided into three groups: 1) resyllabification (e.g. The boy always talks on the phone), 2) no-resyllabication (e.g. He always talks by the telephone), and 3) no adjacent context (e.g. He talks). Most utterances were included in the no-resyllabication group (n = 241), followed by the no adjacent context (n = 46) and finally the resyllabication group (n = 21). Learners were more successful in the absence of an adjacent context (70%) (e.g. He talks), whereas their performance in resyllabication and no-resyllabication was comparable, reaching 57% and 59% respectively. Although the limited number of utterance included in the resyllabication group does not allow to make a strong claim, the available data suggest that the PTH predictions did not acutely describe child L2 learners’ production of English verbal morphology.

To summarize, production of the morpheme of 3rd person singular –s was problematic for learners and they showed a high percentage of omission. However, although as a group learners did poorly, there were participants who were highly successful producing the verbal inflection and reached high levels of performance. Neither the age of acquisition nor the time of exposure of the child was demonstrated to have a significant role in learners’ performance. However, it is important to point out that some of the groups in which participants were divided (i.e. according to their age of acquisition and time of exposure) included few or uneven number of participants. Therefore, the question of whether these factors played a role remains mainly
unanswered. In addition, I evaluate the soundness of the predictions made by the PTH. The findings suggest that learners’ difficulties are not necessarily related to phonological problems.

5.5.2 Comprehension Task. A total of 17 learners completed Form A of the test, while the remaining 15 participants completed Form B. A one-way ANOVA showed that performance of these two groups was not significantly different in any of the conditions. That is, learners performed similarly across task forms. I will briefly discuss how learners did in the fillers (i.e. non-masked sentences and progressive verb forms) and will then proceed to the description of the results obtained for the target sentences.

Learners were highly successful in both the sentences with non-masked plurality and the sentences with progressive verb forms. For the non-masked sentences, learners reached an average accuracy of 90% \( (SD = 23) \) and 96% \( (SD = 14) \) for the singular and the plural condition respectively. As for the group of native speakers, they showed an average accuracy of 99% for the singulars \( (SD = 6) \) and 98% for the plurals \( (SD = 8) \). Learners were also very successful at identifying the subject in sentences with a progressive form. They obtained an average accuracy of 97% \( (SD = 12) \) for the singulars and performed at ceiling in the plural condition. Natives performed at ceiling in both conditions. In sum, it seems that it was not problematic for learners to identify the subject’s plurality when it was clearly formulated in the verb form (i.e. verb to be) or when the plurality of the noun phrase was not disguised.

Learners’ performance in the target items did not resemble their performance in the filler items. Instead, results showed that learners did poorly in this type of sentence and it was problematic for them to identify whether the subject was singular or plural when the only cue they had was the verbal inflection (or its absence). As shown in Figure 5.7 below, learners
obtained a low average accuracy of 60% for the singular condition ($SD = 27$) and 63% for the plural condition ($SD = 32$). As for their sensitivity to the inflection, a mean A’ measure score of .64 was observed in learners. By contrast, natives reached a mean A’ measure score of .87. Learners’ and natives’ sensitivity scores were compared and the statistical analysis (ANOVA) revealed that the sensitivity showed by learners and natives was significantly different in the target items ($F(1, 62) = 32.104, p = .000$).

Figure 5.7: English natives’ and English L2 learners’ accuracy percentages in the English comprehension task

Within the L2 learners, there were some differences among the groups with different ages of acquisition and times of exposure. Because participants differed in their age of acquisition and
time of exposure, it will be appropriate to evaluate the role played by both factors to test which factor (if any) was more relevant. As with the production task, learners were divided into two groups according to their age of acquisition (i.e. 4 years of age and 5 years of age). Performance in both groups was similar (Table 5.8). The children who were reported to have started learning at the age of 5 did slightly better in both conditions than those who started at the age of 4. Likewise, the 5-years old group show higher sensitivity scores than the 4-years old group. However, despite these differences, the sensitivity to the inflection in both groups was not found to be significantly different ($F(1, 30) = .2.148, p > .05$).

Table 5.5

Accuracy percentages in the English comprehension task according to English L2 learners’ age of acquisition

<table>
<thead>
<tr>
<th>Age of acquisition</th>
<th>Singular accuracy</th>
<th>Plural accuracy</th>
<th>A’ measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 years ($n = 21$)</td>
<td>58% ($SD = 28$)</td>
<td>60% ($SD = 32$)</td>
<td>.61</td>
</tr>
<tr>
<td>5 years ($n = 10$)</td>
<td>64% ($SD = 26$)</td>
<td>71% ($SD = 33$)</td>
<td>.70</td>
</tr>
</tbody>
</table>
As for the effect played by learners’ time of exposure to English, all children did better in the plural condition regardless of their time of exposure (See Table 5.6). But surprisingly, it was found that those children who had two to three years of exposure did better than those with more years of exposure. Moreover, it was this group that exhibited the highest sensitivity score. Nevertheless, no significant difference was found between these groups’ A’ measure scores ($F(3, 28) = .141, p > .05$). That is, groups’ sensitivity was relatively similar despite their time of exposure.

In sum, the age of acquisition and the time of exposure do not seem to play a significant role. A linear regression analysis confirmed that neither the age of acquisition ($t(29) = 1.563, p > .05$) nor the time of exposure ($t(29) = .716, p > .05$) affected learners’ sensitivity in a significant way.

Table 5.6

Accuracy percentages in the English comprehension task, according to English L2 learners’ time of exposure

<table>
<thead>
<tr>
<th>Time of exposure</th>
<th>Singular accuracy</th>
<th>Plural accuracy</th>
<th>A’ measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3 years ($n = 7$)</td>
<td>68% ($SD = 28$)</td>
<td>73% ($SD = 27$)</td>
<td>.67</td>
</tr>
<tr>
<td>4 years ($n = 19$)</td>
<td>59% ($SD = 29$)</td>
<td>65% ($SD = 30$)</td>
<td>.61</td>
</tr>
<tr>
<td>5 years ($n = 6$)</td>
<td>53% ($SD = 21$)</td>
<td>58% ($SD = 36$)</td>
<td>.64</td>
</tr>
</tbody>
</table>

Besides looking at the effects of the age of acquisition and the time of exposure, I looked at verbs individually to evaluate how learners perform across verbs. All 10 verbs used in the target sentences are presented in Figure 5.9. As shown in Figure 5.9 below, learners were more
successful with the verb *smoke* (84%). They did markedly poorer with the verbs *stir* and *smell* reaching only 41% and 38% respectively. Both the singular and the plural versions of the item were problematic and in both, learners’ proficiency was poor. This however was not the case for the native speakers who reached high levels of performance in both verbs (94% for each verb).

Learners’ poor performance in the two verbs (i.e. *stir, smell*) might have been related to the syntactic structure of the sentences and the pictures presented along with the stimuli. Both verbs were transitive and, as such, they were embedded in sentences that required a direct object. The verb *stir* was used in the transitive sentences *The cook(s) stir(s) the soup*. In this item, the pictures depicted one cook stirring a pot of soup and another picture showing two cooks each stirring a pot of soup (i.e. there were two pots of soup). Having two different pots of soup when the stimuli had a singular direct object (i.e. the soup) might have affected learners’ responses and made it problematic for them to choose between the singular and the plural subject picture. The verb *smell* was used in the transitive sentences *The rabbit(s) smell(s) the flower*. In this item, the pictures showed either one rabbit smelling a single flower or two rabbits smelling a single flower. Although in this item the number of the direct object matched that of the stimuli (i.e. smell(s) a flower/a single flower), learners might have had difficulties processing the sentence. Because these two items were found together and were presented one after the other (i.e. *smell* was followed by *stir*), this might have also affected learners’ performance. However, learners did not perform equally as poorly across transitive sentences. For instance, learners performed better in the item *The elephant(s) spill(s) the paint* (65%).
Figure 5.8: English L2 learners’ accuracy in the verbs used in the English comprehension task

In its original version, the PTH did not predict comprehension to be affected by differences found between the prosodic structure of the L1 and the L2. However, this claim has been recently challenged. According to Lieberman (to appear), comprehension may be affected as well. In light of this new data, learners are expected to use the same reparatory strategies in production and comprehension. That is, learners are expected to show asymmetry between their performance with short-stem (-VC) and long-stem verbs (-VVC or –VCC), as well as in resyllabication and no-resyllabication contexts. As with the production task, I evaluated the predictions of the PTH. However, the experiment was not designed to test the PTH. Out of the 10 target items included in the comprehension task, only three were long-stem verbs (i.e. stink [stɪŋk], smoke [smoʊk], stand [stænd]); the remaining were short-stem verbs (i.e, sleep [sliːp ], smell [smel], stir [stɜːr], spill [spɪl], swing [swɪŋ], swim [swɪm], and sweep [swiːp]). The results obtained for each of these verbs suggest that there was no asymmetry between short-stem and long-stem verb forms. See Figure 5.9 above. Learners perform poorly with both the short-stem and long-stem verbs. Moreover, the lowest accuracy percentages were scored with stir and smell,
both short-stem verbs, whereas the highest accuracy percentage was achieved with *smoke*, a long-stem verb. As for the effects of resyllabication, there seems to be a relationship, although not clear, between the learner’s success at comprehending the inflection and the following phonological context. Out of the target items, there were only four verbs followed by a word that started with a consonant (e.g. the) and not a vowel. These verbs were *sweep* (51%), *stir* (41%), and *smell* (38%). At first sight, this seems to support the prediction made by the PTH. That is, learners perform particularly poor in no-resyllabication contexts. However, also note that learners did equally poor with *sweep* (56%) and *stink* (56%), although the latter, in contrast to the former, is followed by a vowel (*The skunk stinks on the grass*). Despite the apparent relationship between the adjacent context and learners’ performance in comprehension, a strong claim cannot be made either against or in favor of the PTH.

To summarize, it was problematic for learners to identify the number of the noun phrase in the target sentences. Learners’ sensitivity to the inflection was significantly different from that of the natives’ speakers. They performed above chance but still poorly in both the singular and plural condition. Nevertheless, their performance with the non-masked and the progressive items was practically native-like, reaching high accuracy percentages in both contexts. These findings show that learners are able to both identify plurality and the /s/ sound in English. Similar to the production task, the time of exposure and the age of acquisition did not played a significant role in the learners’ sensitivity. When verbs were looked at individually, results showed that some verbs were more problematic that others. Although I initially considered the syntactic explanation (i.e. transitiveness) the prosodic structure (e.g. resyllabication) might have instead played a role in learners’ success in comprehending the
verbal inflection. Nevertheless, as exposed above, a strong claim about the effects of the
prosodic structure cannot be made.

5.5.3 Production Versus Comprehension. One of the main objectives of the present
study was to evaluate and compare learners’ performance across task modalities. In order to
compare learners performance in production and comprehension, their accuracy in production
and their A’ measure scores were compared. A cutoff point of .10 was used to determine if
learners did better in one of the tasks. Overall, natives were found to be better at producing (.98)
the inflection than at comprehending it (.87). Nevertheless, when natives’ performance across
tasks was evaluated, it was found that they showed three patterns. See figure 5.10. Most natives
did equally well across tasks ($n = 15$) or better in the production task ($n = 13$) and a minority
scored higher in the comprehension task ($n = 4$)
As for the learners, in general terms, results showed that it was problematic for child L2 learners of English to produce or comprehend the inflection for 3rd person singular. Indeed, children supplied the inflection in 58% of the instances and they showed a sensitivity score of .64 of the subject of sentences with a verb inflected for 3rd person singular. Moreover, learners’ A ‘measure scores (.64) were much lower than those observed in natives (.87) and they were found to be significantly different \( F (1, 62) = 32.104, p = .000 \). This may suggest that learners did almost equally poor in both test modalities.

Nevertheless, in contrast to the natives in whom three patterns were found, when individual results were evaluated only two patterns emerged in learners (See Figure 5.11). Learners either did better in production \( (n = 16) \) or they did better in comprehension \( (n = 16) \). No learner scored equally across tasks. In those who were better at producing the inflection,
scores ranged from 0 to 1, whereas in those who were better at comprehending the inflection, scores range from .38 to 1.

Figure 5.10: Learners’ accuracy percentages across tasks

In reference to the Spanish experiments (Figure 4.11) where most learners were either better at producing the inflection or scored equally in both tasks, in the English experiments, neither asymmetry direction prevailed as half of the English L2 learners scored higher in production and the other half scored higher in comprehension. Moreover, no English L2 learner scored equally in both tasks. Those English L2 learners who scored higher (.90 or above) in the production did not necessarily scored high in sensitivity. In other words, they might have scored high in production regardless of the sensitivity scores. Only two participants scored high (90. or above) and were better in the comprehension task. Because of the limited number of participants, a tendency was hard to draw. One participant showed perfect sensitivity score and the other scored .90. The former showed a mean accuracy of .90 in production, whereas the later reached
.60 of accuracy. This finding seems to suggest that if the learner showed high sensitivity to the inflection, he might also be highly accurate in production. However, because of the limited data, we cannot arrive to a conclusion. To ascertain whether learners’ performance in one type of task (e.g. production task) was related to their performance in the other task (e.g. comprehension task), a Pearson’s correlation was conducted and no correlation was found between learners’ performance in production and their performance in comprehension ($r (32) = .187, p > .05$).

5.5.4 Summary

To summarize, the main findings on English child L2 learners’ performance in production and comprehension are outlined below:

- 53% of the learners did poorly in production and performed significantly different from the group of native-speaking children.
- In general, learners were very successful at identifying the number of the subject when this grammatical information was not obscured and was easily available for them in the subject (plural –$s$) or verb form (auxiliary $be$).
- However, they had difficulties identifying the subject of the sentence when the only reliable cue available was the verb ending and their sensitivity was significantly different from that of the native speakers.
- Learners’ age of acquisition and time of exposure did not play a significant role on their performance in either production or comprehension.
- The group results showed almost equal performance in production and comprehension.

In both tasks, learners were found to perform significantly different from native English-
speaking children. However, two patterns emerged when individual results were
evaluated. Some did better in comprehension while others did better in production.

As shown by the results, it is generally problematic for child L2 learners of English to
produce and comprehend verbal inflection. Many are not able to reach high levels of
performance in production; instead they tend to frequently drop the inflection. In comprehension,
learners did slightly but not significantly better. Moreover, learners were found to perform
significantly different from the natives in both production and comprehension. These findings
support the proposal that poorly inflected languages delay the process of morphological
acquisition. Because learners did almost equally as low across tasks, the results seem to support
the claim that the representation of the verbal inflection in these learners has yet to be acquired.
However, it is important to notice that when compared to the native speakers, the learners did not
show a unique pattern and they could do better in either production or comprehension. The cross-
language analysis revealed that English L2 learners were more successful at comprehending the
inflection in the L2 and more successful at producing the inflection in the L1. This asymmetry,
as I briefly discuss in Chapter 4, may be related to the processing loads imposed by these tasks.
A more detailed discussion about the results will be presented in the following chapter.
CHAPTER 6
CROSS-LINGUISTIC DIFFERENCES BETWEEN L1 AND L2

Each participant was tested in their first language and their second language. This allowed me to do a within subject analysis and to compare participants’ performance across languages. I compared the performance of each child in comprehension and production. I evaluated whether the child scored higher in production in his L1 or in his L2. Likewise, I evaluated in which language the child showed higher sensitivity scores. In order to do a cross-language comparison, I set a cutoff point of 10. If the child scored 10 points higher in one of the languages either in production or comprehension, he was considered to have performed better in one of the languages (i.e. the L1 or the L2). If, instead, the differences across languages were less than 10 points, he was considered to have scored similarly across languages. In sum, I compared Spanish L2 learners’ performance in their L2 (i.e. Spanish) and their L1 (i.e. English). I also evaluated English L2 learners’ performance in their L2 (i.e. English) and their L1 (i.e. Spanish). In what follows, I will first describe the findings for the Spanish L2 learners and will later describe the results for the English L2 learners.

Spanish L2 learners did not show much variation in production in their L1. They all reached high percentages and accuracy was not lower than 80%. However, they showed more variation in their L2. As shown in Figure 6.1, most Spanish L2 learners showed higher production accuracy in the L1 (n = 21) than in the L2. Seven participants scored equally across languages and just four participants were better at producing verbal inflection in their L2 than in their L1. Surprisingly, all those who performed equally across languages or better in the L2 showed perfect accuracy in both languages or in the L2 respectively.
As for their sensitivity scores, Spanish L2 learners showed variation in their L1 and their L2. As illustrated in Figure 6.2, most learners showed higher A’ measure scores in their L1 ($n = 19$). That is, most learners showed higher sensitivity to the inflection in their L1 than in their L2. The remaining participants either scored equally across languages ($n = 8$) or scored higher in the L2 ($n = 5$).
Like the Spanish L2 learners, most English L2 learners were more accurate producing verbal inflection in the L1 than in the L2 ($n = 23$). See Figure 6.3. Seven children performed equally across languages and only two children showed higher accuracy in the L2. However, if we compare the results of the Spanish L2 learners in Figure 6.1 to those of the English L2 Learners in Figure 6.3, it is interesting to see that the differences between the L1 and the L2 are less drastic in the latter than in the former. In other words, the cross-linguistic differences in the production task are more marked in the group of English L2 speakers than in the Spanish L2 learners.
Figure 6.3: English L2 learners’ production accuracy in the L1 and the L2

As for the A ’measure scores, most English L2 learners showed higher scores in the L1 than in the L2 \((n = 18)\). See Figure 6.4. Nine participants scored higher in the L2 and five showed equal scores across languages. It is worth noticing that when compared, English L2 learners, overall, tended to show lower sensitivity scores in their L1 (i.e. Spanish) and their L2 (i.e. English) than Spanish L2 learners who were more likely show higher sensitivity scores in both languages.
In sum, both the Spanish L2 learners and the English L2 learners tend to perform better in the L1 than in the L2 in both production and comprehension. Therefore, regardless of the L2, participants were more likely to reach higher accuracy in production or higher sensitivity scores in the L1. However, a finding that should be further investigated is the difference found between Spanish and English L2 learners and their cross-linguistic differences (i.e. L1 vs L2). Particularly interesting was the fact that the Spanish L2 learners, overall, tended to show higher sensitivity scores than the English L2 learners.

A definite explanation for this finding could not be given at the moment. However, there might be some who argue that non-linguistic factors could have played a role. For instance, the socio-economic background of both groups (i.e. Spanish L2 learners vs. English L2 learners) could have had an effect. Differences in the groups’ socio-economic status could have an effect.
in children’s linguistic performance (Dearing, McCartney & Taylor 2001). Although, this factor could not be ruled out, the groups’ characteristics suggest that this was unlikely. Both groups might be considered to be middle socioeconomic status. The school in Michigan was a magnet school in a suburban area, whereas the school in Puerto Rico was a private college in the capital. Another possibility that could be contemplated is the effects that learning a L2 may have in the L1. Bilingualism has been found to foster cognitive growth (Cummins 1979). Bialystock (1986) reported that bilinguals showed greater abilities to solve problems that involve high levels of control (e.g. metalinguistic awareness). Furthermore, bilinguals may outperform their monolingual analogs in some domains (Cummins 1980). Nevertheless, because both groups were bilinguals, we cannot attribute Spanish L2 learners’ higher sensitivity scores solely to the fact that they were bilingual. Studies have found that learning an L2 may have positive effects in L1 skills (e.g. Literacy). However, we still do not yet know whether the effects in the L1 would be similar regardless of the language. In other words, it is unknown whether learning a highly inflected language would have the same effects as learning a poorly inflected language. For instance, we do not know whether in children learning an L2 with rich verbal morphology, morphological processing in their L1 might be heightened. This possibility cannot be tested with the data at hand, but a future study that compares monolingual English speakers and L1-English L2-Spanish speakers might shed some light on the matter.
CHAPTER 7
DISCUSSION AND CONCLUSIONS

The present study had two main goals. First, it studied the connection between the type of task (i.e. production vs. comprehension) and second language learners’ performance by evaluating whether and to what degree they were able to produce and comprehend verbal inflection. Second, it investigated whether the structure of the language interacted with learners’ performance and rate of acquisition. This goal was addressed by studying verbal morphology acquisition in child L2 learners of Spanish and child L2 learners of English, two typologically distinct languages. These two languages were selected because of their cross-linguistic differences. Spanish has a highly and regular inflected verb paradigm while English has a poorly and irregular inflected verb system. To assess children’s verb agreement morphology knowledge, two studies were carried out consisting of two experiments each: a Spanish production task, a Spanish comprehension task, an English production task, and an English comprehension task. The Spanish tasks evaluated learners’ knowledge of the 3rd person plural –n and the English tasks evaluated learners’ knowledge of the 3rd person singular –s.

From the obtained results and previously reported findings, two claims are made for child L2 acquisition. First, I suggest that the child L2 learner’s grammar is not impaired. Despite the learner’s difficulties with verbal inflection, they seem to have knowledge of plurality in the second language. Both Spanish L2 learners and English L2 learners were successful at identifying the subject of the sentence when plurality was not disguised. In addition, the individual results showed that there were some learners who seem to have knowledge of agreement but who also showed asymmetry, performing better in one of the tasks. If learners did
not have knowledge of agreement then we would have expected them to perform similarly poor in both production and comprehension. Moreover, there were some learners who performed at a native-like level in either production or comprehension or both. The findings also suggest that learners’ problems are not due to a lack of grammatical knowledge. Instead, I proposed, similar to what has been proposed for L1 acquisition, that problems in performance may be related to the morphological robustness of the verbal paradigm (Phillips 1995/2010, Legate & Yang 2007). Either children learning poorly inflected language will have greater difficulties in gaining automaticity in accessing and merging the verb and the inflectional feature (Phillips 1995/2010) or they will take more time figuring out whether or not the language marks T and Agr (Legate & Yang 2007). In languages with a poor verbal morphology (e.g. English), learners' opportunities to access morphological knowledge are fewer and, as a consequence, the process of morphological merging in these learners will become automatic at a slower pace than in those learning a highly inflected language (e.g. Spanish) where opportunities are much more available (Phillips 1995/2010). However, it may also be that, as proposed by Legate and Yang, sparse verbal paradigms (e.g. English) provide less evidence for T and Agr than those languages with more robust morphology (e.g. Spanish) that provide proportionally more evidence. According to this model, in English, children will likely take longer to determine whether the language overly marks T and Agr than children learning Spanish, who will be able to master tense and agreement marking at a faster rate. If this proposal is extended to L2 child acquisition, then the differences found between Spanish and English child L2 learners could be adequately explained. The results of the present study seem to support the claim that the morphological structure of the language may have an effect in learners’ rate of acquisition. The richness of the verb paradigm seems to
play a role in either facilitating or delaying the process of acquisition. More precisely, it is suggested that highly inflected verb paradigms speed up the process, while poorly inflected systems delay it.

In what follows, I discuss the findings generated for the Spanish and the English experiments. I first discuss the findings of the Spanish experiments and then discuss the findings of the English experiments. These two sections are followed by a general discussion. At the end of the chapter, a section of practical applications as well as the limitations of the study and avenues for future studies are discussed.

7.1 Spanish Experiments

The purpose of these experiments was to investigate whether child L2 learners of Spanish were successful at producing and comprehending the verbal inflection for 3rd person plural –n. Because Spanish has a rich inflectional system, I predicted that child L2 learners of Spanish would show high accuracy in producing the inflection for 3rd person plural –n. Learners of a highly and regular inflected language have many opportunities to engage in the process of morphological access. This allows the learner to practice with the process of verbal morphology access. Learners of Spanish, through the input, are exposed to robust evidence indicating that the language overtly marks T and Agr, allowing them to set a [+ Agr] and [+Tense] grammar at a faster rate than those children who are learning a language with scarce morphology. This prediction was supported by the data. Although the statistical analysis revealed that the learners as a group performed significantly different from native speakers, they reached levels of accuracy close to 80%, therefore, being successful at producing the verbal inflection most of the time. Moreover, many learners did perform within the level of accuracy of the native speakers.
It is important to note that the learners in this study showed higher rates of accuracy (79%) than those reported previously (56%) by Herschensohn et al. (2005). This discrepancy between the studies may be related to the amount of exposure both groups of learners received. Both groups were enrolled in a Spanish immersion program, but the children in Herschensohn et al. were exposed to Spanish for only half of each day of instruction while the other half was conducted in English, their native language. By contrast, the children who participated in the present study were enrolled in a total immersion program where they are exposed five days of the week and all of their courses but one are in English. That is, Spanish is used as the medium of instruction for most of the school day. Indeed, research on immersion programs has found that total immersion programs yield better results in terms of accuracy than partial immersion programs (Lyster 2007). This also highlights the importance of the amount of input and how quantitative differences may have an effect in verbal morphology acquisition.

However, when the accuracy average shown by the children in the present study and that reported in adult L2 learners were compared, it was found that both groups show similar accuracy percentages. In Mezzano (2003) a group of beginner adult L2 Spanish learners was found to correctly inflect 75.7% of the verb forms. In her study, Bruhn de Garavito (2003) reported accuracy rates much higher than those reported in Mezzano (no lower than 90%). This low error percentage in Bruhn de Garavito, however, was not expected and the author attributes learners’ success to the “fact that the production test included cues which may have made the processing load lighter than a fully communicative situation” (p. 413). Nevertheless, it is surprising that the adults evaluated in these two studies showed an accuracy close to 80% or higher but had had much less exposure (e.g. no more than 8 months) to the target language than
the children included in the present study who on average had 3.8 years of exposure. Note, however, that Mezzano (2003) and Bruhn de Garavito (2003) evaluated learners’ production of verbal inflection in general and were not limited to plural number (i.e. 3rd person plural –n) as was the case in the present study.

This finding suggests that children may take longer to achieve accuracy percentages that are achieved by adult learners in a relatively short period of time. Actually, there is evidence that older learners may perform better and may have some advantage over younger learners in terms of rate of acquisition (Carroll 2008; Ellis N. 2005). Adults’ apparent advantage may be related to the type of instruction they are exposed to and to their cognitive capacity. Language learning in adults is more explicit than that of children and it can speed up the process of acquisition (Lichtman 2013). At the time of the testing, the adults in Mezzano (2003) and Bruhn de Garavito (2003) were learning Spanish in a college-level language course. The children, on the other hand, were learning the language in an immersion setting. Students in an immersion program learn the second language “incidentally” by being exposed to highly meaningful input (Genesee 1991). Therefore, the second language is acquired through implicit teaching and learning. Implicit learning, although a more reliable kind of language learning, may occur at a slower pace than explicit learning (Ellis, N 2005). As for the cognitive capacity, adults’ working memory is larger than that of children, thus allowing the former to retain more verbal information than the latter (Carroll 2008). In addition, metalinguistic knowledge in adults is greater than in children. Before the age of 7 a child’s metalinguistic skills are not very productive (Clark 1978). It is not until around the ages of 7 or 8 that children start using their metalinguistic knowledge in a consistent and productive manner. Metalinguistic skills, in contrast to other linguistic knowledge (e.g.
morphosyntactic knowledge) continue developing until adulthood, when they reach their highest level. Therefore, in learning a language, an adult can rely more on his/her metalinguistic knowledge than a child is able to. This, in turn, may allow adults to show faster rates of acquisition than children.

Another finding revealed by the data was the limited number of infinitive forms produced by the child L2 learners of Spanish (e.g. 15%). Most of the verbs produced by the children were inflected but in many of them, the children failed to produce the 3rd person plural and instead produced the 3rd person singular. That is, most errors were number errors rather than non-inflected forms. This suggests that the learners were aware that Spanish verbs must be inflected. Such finding was also reported in Herschensohn et al. (2005). The authors maintain that the limited use of infinitive forms in the learners’ data and their preference for inflected forms, although sometimes incorrect, serves as evidence that child L2 learners of Spanish show sensitivity to inflections. When compared, adult Spanish L2 learners and child L2 learners are both found to show low rates of infinitive forms. Mezzano (2003) found that infinitive forms only accounted for 4% of the verb forms produced by a group of Spanish adult L2 learners. Hence, adults show even lower rates of accurate forms than children.

In Herschensohn et al. (2005) infinitive forms in child L2 learners’ speech were compared to the rate of infinitives found in a group of adult and teen L2 French learners. The authors observed that child L2 learners of Spanish showed lower rates of infinitives than adult L2 French learners. They attributed this to the different acquisition processes followed by children and adults. Herschensohn et al. propose that the difference found between children and adult L2 learners is related to advantages children have over adult learners in perceiving bound
morphemes. Children have been claimed to show greater sensitivity to bound morphemes than adult L2 learners who appear to focus more on free morphemes (Newport 1994; Zobl & Liceras 1994). Children are better at perceiving and storing small linguistic units whereas adult L2 learners are better at perceiving and storing whole complex units. Although Herschensohn et al.’s explanation is well founded, it might not have adequately interpreted child L2 Spanish learners or adult French L2 learners’ differences.

As I discussed above, if errors of verb morphology in child L2 Spanish learners are compared to those of adult L2 Spanish learners, Herschensohn et al.’s proposal is no longer supported. The percentage of errors in child L2 Spanish learners and adult L2 Spanish learners are found to be similar, with adults showing even fewer numbers of infinitive forms than children. The difference between children and adults observed in Herschensohn et al. might be related to the morphological structure of the target language rather than to the age of the learner.

The verbal inflectional system of French is poorer than that of the Spanish verbal system. As I discussed in Chapter 3, when we compare adult L2 Spanish learners and adult L2 French learners, the former group of learners show lower rates of infinitives than the latter. Therefore, differences in the rate of infinitive forms in adult and child L2 learners may not be exclusively related to the age of the learner (i.e. cognitive abilities) and type of learning (i.e. implicit vs. explicit), but they may also be due to the morphological structure of the target language (i.e. richly vs. poorly inflected)

Commission errors were also rarely found in the learners’ data. The use of persons other than 3rd person accounted for only 7% of the verb forms. This suggests that learners were aware that the context required 3rd person rather than 1st or 2nd person. Most of the errors made by the
learners were number agreement errors. In other words, learners failed to produce the inflection for 3rd person plural –n and instead produced a verb conjugated for 3rd person singular. Learners’ failure to produce 3rd person plural might lead us to assume that, similar to child L1 learners (Perales, Liceras & Bel 2006), child L2 learners avoid using plural forms. In L1 acquisition, it has been suggested that because 3rd person singular lacks specific morphology, children treat it as a default form (Ezeizabarrena 1997, Tsimili 1992). However, the design of the experiment does not allow us to make such a claim. The production task only included plural subject-pictures; therefore, it did not assess learners’ knowledge of 3rd person singular. Nevertheless, Herschensohn et al. (2005) reported that child L2 learners of Spanish were as likely to use the singular form instead of the plural form as they were to use the plural form instead of the singular form. Hence, we could assume that the children did not use a default form. Instead, previous findings suggest that they were aware that they needed to conjugate the verb for 3rd person, but at the moment of producing it, they failed to produce the -n of 3rd person plural.

As for the effects of the extra-grammatical factors (i.e. the age of acquisition and time of exposure), the analyses revealed that neither of these factors played a role in the children’s accuracy. The age of acquisition of the children ranged from 4 to 7 years old, but most of the children started learning Spanish when they were either 4 or 5 years old (n = 26). Only five children reported an age of acquisition of 6 or 7. Therefore, the reason why the statistical analysis did not find a significant difference between the groups might have been related to the limited and uneven number of participants included in the groups. The same thing may have happened with the time of exposure. Children’s time of exposure ranged from two to six years of
exposure. The group with four years of exposure had the greatest number of participants including a total of 11 children. The remaining four groups (i.e. groups with 2, 3, 5 or 6 years of exposure) included six or fewer participants. The statistical analysis, then, might have failed to demonstrate any significant relation between the children’s time of exposure and their performance because of the limited number of participants included in each of the groups.

Although it is out of the scope of the study, I analyzed the frequency of the verb to ascertain whether it was a factor that should have been taken into account to explain learners’ performance in both production and comprehension. Because the analysis revealed that it did not play a significant role, I did not include it in the results. Nonetheless, the analysis may be found in Appendix E.1 for reference. Despite the fact that there was no relationship between the verb frequency and the learner’s performance, the effects that the frequency of the verb might have in the learner should not be discarded. For the purpose of the study, I used the Corpus de Referencia del Español Actual (CREA). CREA is a corpus created by the Real Academia Española that can be accessed online. This is an oral and written corpus that includes a relatively wide period from 1975 to 2008 and all the main Spanish varieties (e.g. peninsular Spanish, Caribbean Spanish, Andean Spanish, etc.). Although this corpus is very comprehensive, I am not sure if the frequency reported in the corpus will translate into the classroom setting. That is, we cannot be certain what verbs are more frequently used in class and, in particular, what verbs are more commonly used in an immersion classroom setting. Ideally, a study in which the verbs used in class were quantified should have been done previously to test the role play by frequency. In this way, it would have been possible to determine what verbs were used in class and how
frequently the children were exposed to them. However, for practical reasons and because this was not the main goal of the study this was not done.

In sum, although some individuals show difficulties producing the inflection for 3rd person plural, they seem to be aware that verb forms in Spanish must be inflected and cannot be produced in the infinitive form. Moreover, children seem to have knowledge of person agreement in Spanish as shown by the low percentage of commission errors. Overall, not all learners perform at a native-like level; nevertheless, they may still achieve high accuracy, which might be considered as evidence of learners’ advanced knowledge.

A second research question posed in the present study was whether child L2 learners of Spanish were able to use the verbal inflection for 3rd person plural –n to assign number to the noun phrase in comprehension. In this regard, I had predicted that because Spanish is a highly inflected language, child L2 learners of Spanish would be successful in processing the Spanish 3rd person plural.–n as a number marker. This prediction was supported by the data. In the target items, no significant differences were found between the learners’ and the native speakers’ sensitivities. In other words, learners reached a native-like level of performance in comprehending verbal agreement. In the absence of reliable cues of number in the noun phrase, both learners and natives could rely on the verb inflection to assign number to the subject of the sentence. This suggests that learners understand the grammatical meaning carried by the verb inflection and can productively use it in comprehension. In the comprehension task, neither the learners nor the native speakers reached a mean accuracy higher than 88%. This was somewhat expected because the task required children to be very attentive to the stimulus presented with

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each item. This may have been demanding on the children’s attention span. Nevertheless, both groups performed above chance in both the singular and plural condition.

However, an unexpected result of the study was learners outperforming native-speakers in some of the target items. In these items learners were more successful at identifying the number of the subject than natives. The results suggested that natives’ performance in such items may be related to the way they segmented the stimulus. In order to process an aural stimulus, listeners need to “break continuous streams of sound into potentially meaningful units” (Sander, Neville & Woldorff 2002, p. 520). This process may be affected by several factors. For instance, it has been found that lexico-semantic, syntactic and prosodic cues may play a role in how the listener segments speech (Cutler, Mehler, Norris & Segui 1992; Sanders & Neville 2000). This, however, does not mean that the speaker uses them all or to the same extent. Instead, the listener may use multiple cues, a combination of them, and under different circumstances. Therefore, they are not used in an absolutely reliable way (Sanders & Neville 2000; Sander, Neville & Woldorff 2002). Moreover, L2 learners have been found to not use the same cues or to use them in the same way native speakers use them. Indeed, Sander et al. (2002) reported that L2 learners are able to deal with the absence of a particular cue (e.g. semantic) like native speakers do, but they are also found to be able to use a greater variety of cues (e.g. stress-pattern) to segment speech. One possibility for the obtained results might be that learners used another cue for segmenting the stimulus that was not available to native speakers.

It is also important to consider the fact that the Spanish learners in the study were schooled almost exclusively in Spanish. In school, the children started to learn to read in Spanish in first grade and it was not until second grade that they started to read in English. By contrast,
the Spanish native speakers were enrolled in an English immersion program. That is, L2 learners were not compared to a control group in the traditional sense but, rather, they were compared against a group of bilinguals. In this school, children are almost exclusively schooled in English and have only one class in Spanish. It is not until sixth grade that they start having more courses taught in Spanish. We could assume, then, that the learners might have been exposed to written Spanish more often than the natives might have been at the time of the testing and that familiarity with the orthography of the language played a role in the participants’ abilities to segment the aural stimuli. Listeners have been found to integrate their orthographic knowledge in speech segmentation and perception (Burton 2004). Studies on second language perception have reported that learners can take advantage of orthographic information in perceiving segments in the second language (Onnis & Uchida 2012). However, I do not have a reliable way of measuring how much exposure to written Spanish the native speakers had outside the school. For example, I do not know whether they read Spanish books at home. Therefore, I am not able to draw any conclusion about the effects that orthography might have played in the learners’ ability to segment the stimuli.

Yet another possible explanation comes from a study about the acquisition of the Japanese verbal inflection by adult L2 leaners. Sugaya (2009) found that L2 Japanese learners outperformed Japanese natives in one of the conditions included in the study’s experiment. The experiment was designed to assess learners’ and natives’ knowledge of conjugation of nonce regular verb forms and real regular verb forms. Results for the nonce verb forms revealed that learners’ scores were better than those shown by the group of native speakers. That is, L2 learners outperformed native speakers. Sugaya (2009) suggests that learners and natives treat
verb inflection differently and that L2 learners’ advantage may be because learners are more rule-oriented than native speakers. Therefore, child L2 learners’ outperformance in the comprehension task might have been related to how they and native speakers treat inflection rules in Spanish. However, because learners showed greater advantage in the items where the contiguous sounds seem to have played a role, it does not seem appropriate to dismiss the phonological context as a possible factor for learners’ advantage. Instead, I am inclined to suggest that not just a sole factor but several factors might have contributed to learners’ outperformance.

In the comprehension task I also included nine fillers: three null subject sentences and six non-masked sentences. The non-masked items, in particular, were included to assess learners’ ability to identify plurality and perceived the –s sound in the target language. Results for these items revealed that the child L2 learners are highly successful at identifying verbal agreement when cues are available both in the noun phrase and the verb inflection (e.g. ellas corre[n en las mañanas). Similar to native speakers, the child L2 learners were more successful with these items than with the target items. This is not surprising if we keep in mind that in such items learners have multiple cues to rely on. Moreover, the noun plural marker is the same in English and Spanish; both use the affix –s in the noun to mark plurality. As for the null subject sentences, learners’ performance was not equally successful in these items. As described in Chapter 4, learners reached high levels of performance in the singular condition, but their performance in the plural was markedly lower. What might have affected learners’ performance in the null subject sentences was the absence of an over noun phrase, which in English is not allowed. The
differences between the L1 and the L2 may have played a role in the children’s responses in the null-subject condition.

To summarize, child L2 learners of Spanish can use the verb inflection to get grammatical information about the noun phrase. In other words, they can use the verb inflection as the sole cue to identify number agreement. However, it was also evident from the results that when learners have multiple grammatical cues to rely on (i.e. non-masked items) they are able to achieve higher levels of performance.

The third research question for the Spanish experiments was related to the learners’ performance across tasks. In particular, the question was whether child L2 learners of Spanish were affected in the same way in both the production and the comprehension task. I had predicted that if the opportunities child L2 learners of Spanish have to access their morphological knowledge, either in the input they receive or in the output they produce, promoted learners’ global performance, learners perform similarly across tasks. However, I also predicted that if learners were to perform better in one of the tasks, because production might be more costly, production would be more affected by performance factors than comprehension and learners would be more accurate in the comprehension task than in the production task.

The predictions were partially supported by the data. The results revealed that the learners reached high levels of accuracy in production. Learners produced inflected verbs most of the time showing that they are aware and have knowledge that Spanish verbs are required to be conjugated and agree with their subject. In the comprehension task, when compared to the group of native speakers, the analysis showed that learners indeed reached native levels of performance at comprehending the inflection for 3rd person plural –n. That is, learners
performed similarly to the native group. Both learners and natives showed similar patterns of performance in comprehending the form, performing notably better in the plural condition than in the singular condition. Moreover, they showed similar sensitivity scores. Taking these two findings together, we can assume that, overall, learners were successful at producing and comprehending Spanish verbal inflection.

However, as I mentioned in Chapter 4, it is worth noting that when results are evaluated individually, not all children were found to do equally well in comprehension and production. Instead, three patterns were shown in learners. Most learners did better in production or equally well in both modalities while others did better in comprehension. Those who did not show asymmetry between their performance in the production and the comprehension task (i.e. performed equally well across tasks), showed, on average, high levels of performance. Moreover, when the data of those children who reached 100 percent of accuracy in either production or comprehension was closely examined, it was found that, on average, they showed an accuracy of 70% in the other task. These results suggest that once learners master the verbal inflection in one of the language modalities, they will show high levels of performance in the other modality. In addition, the cross-language comparison revealed that, overall, Spanish L2 learners scored higher in production or showed no asymmetry and that that was true for both their L1 (i.e. English) and their L2. In sum, results suggest than in Spanish L2 learners, production may precede comprehension and that this holds across languages.

7.2 English Experiments

The purpose of these experiments was to investigate whether child L2 learners of English were successful at producing and comprehending the verbal inflection for 3rd person singular –s.
The first research question posed for the English experiments was whether child L2 learners of English were successful at producing the verbal inflection for 3rd person singular –s. Because English has a poorly inflected verbal system, I had expected child L2 learners of English to show low rates of accuracy in producing the inflection for 3rd person singular -s. This prediction was supported by the data. In the production task, learners performed poorly, only showing a low accuracy of 58%. Learners frequently omitted the verb inflection and failed to produce the inflection in almost half of the utterances produced.

As for the extra-grammatical factors, the analyses revealed that neither the age of acquisition nor the time of exposure played a significant role in learners’ performance. However, similar to the Spanish tasks, the lack of significance might be related to the distribution of the participants. As shown by the number of participants included in each group, the distribution between the groups was uneven and two of the groups had less than 10 participants. This might have contributed to the lack of significance.

Similar to the Spanish experiments, I also evaluated the effect that frequency could have had in learners’ performance in the English experiments. Please refer to Appendix F for details. The analysis revealed that it did not play a significant role in the learners’ performance. Nevertheless, the effects that the frequency of the verb might have in learners, as it was also said for the Spanish task, should not be discarded. For the purpose of the study, I used the corpus published by Francis & Kučera (1982). Although this corpus is very comprehensive, we cannot be certain what verbs are more frequently used in class, in particular, what verbs are more commonly used in an immersion classroom setting.
In summary, it can be concluded that most child L2 learners of English show difficulties producing the inflection for 3rd person singular. Such a finding supports the claim that learning a poorly inflected language like English may delay the process of acquisition and it may take longer for learners to achieve high levels of accuracy.

The second research question for the English experiments asked whether child L2 learners of English were able to use the verbal inflection for 3rd person singular –s to assign number to the noun phrase in comprehension. Because English is a poorly inflected language, I predicted child L2 learners of English not to be successful in comprehending the English 3rd person singular.–s as a number marker. This prediction was generally supported by the data. Learners’ sensitivity scores were found to be significantly different from the group of native speakers. In other words, learners were not as capable as native speakers were to use the verb inflection to identify number agreement when it was the sole cue available to them. Many learners were not able to use the verb inflection as a number marker to the same extent as natives did. Many learners’ performance in the target items, however, did not parallel their performance in the fillers.

In the comprehension task, I included nine fillers: three present progressive sentences and six non-masked sentences. The non-masked items, in particular, were included to assess learners’ ability to identify plurality and perceive the –s sound in the target language. Results for these items revealed that learners were highly successful at identifying verbal agreement when plurality was not disguised and available in the noun phrase (e.g. The boys write a letter). In these items the learners performed at a native-like level reaching percentages as high as 96. This finding is evidence that the learners could notice the plural morpheme –s (or its absence) and
could successfully use it to identify whether the subject of the sentence was singular or plural. That is, it is not problematic for learners to comprehend the grammatical information provided by the mark of plurality in the noun phrase. Indeed, studies have found that the plural morpheme –s seems not to be problematic to child L2 learners and they master this morpheme early in the acquisition process (Dulay & Burt 1973; Dulay & Burt 1974; Goldschneider & DeKeyser 2001). This may be related to the fact that both English and Spanish share the same morpheme to mark plurality in the noun phrase (i.e. plural morpheme –s). In the target sentences (e.g. the cat sleeps on the bed), the –s of 3rd person singular might have misled learners towards the plural interpretation because –s usually marks plurality in both the target and their native language. However, because this same developmental pattern has also been reported for children with a typologically different L1 (e.g. Chinese), learners’ success at identifying the plural –s in English should not be exclusively attributed to language transfer. In a meta-analysis on the acquisition of English morphemes, Goldschneider and DeKeyser (2001) identified five factors that might affect the order of acquisition (e.g. frequency, phonological salience) and suggested that the plural morpheme –s may be easier to acquire than the 3rd person singular –s. As for the sentences with a present progressive form, it comes as no surprise that the learners performed at a native-like level. In these items, marks of plurality were easily available in either the verb form (e.g. is vs. are) or the noun phrases (e.g. children) and the learners were able to successfully identify plurality.

To summarize, in the absence of reliable cues of number in the noun phrase, child L2 learners of English are not successful at relying on the verb inflection to assign number to the subject of the sentence. In other words, many learners show difficulties to use the grammatical
information carried by the verbal inflection to make subject-verb agreement. Nevertheless, they can identify plurality in the second language and accurately use the grammatical information provided by the plural morpheme –s or the auxiliary be when available to them in the sentence.

The third research question dealt with learners’ performance across language modalities. It was aimed to find out whether child L2 learners of English were affected in the same way in both the production and the comprehension task. I had predicted that if learning an impoverished verb inflectional system affected learners’ global performance, then child L2 learners of English would perform similarly across tasks. This prediction was partially supported by the results. The children showed similar accuracy in both production and comprehension. In addition, when compared to the group of the native speakers, learners were found to perform significantly different from natives in both modalities. That is, most learners did not reach a native-like level of performance in any of the tasks.

However, it is worth noting that although in the group results learners performed similarly in the two modalities, the individual results showed that learners may show asymmetry between their performance in production and their performance in comprehension. Practically, half of the English L2 learners scored higher in production and the other half scored higher in comprehension. When the learners who showed asymmetry were compared to those who did equally well across tasks, the latter group tended to show higher accuracy in both production and comprehension than the former group. This suggests that once learners master the verbal inflection in one of the language modalities, they will show high levels of performance in the other modality. In addition, when learners’ patterns were analyzed across languages it was found that although many children scored higher in comprehension in the L2 (i.e. English), they still
scored higher in production in the L1 (i.e. Spanish). These findings suggest that there may not only be asymmetry between tasks but also across languages.

7.3 General Discussion

Taken together, the results revealed that the children learning Spanish were more successful in both production and comprehension than the children learning English. These findings support the proposal that highly inflected verb paradigms may facilitate the process of acquisition while poorly inflected languages may delay it. I proposed that learners of a highly inflected language, like Spanish, may benefit from the opportunities they have to access their morphological knowledge as well as from the evidence of T and Agr marking offered by the input. Contrary to what L2 learners’ intuition might suggest, learning a highly inflected and regular verb paradigm may facilitate and speed the process of acquisition.

However, because perceptual saliency has been claimed to play a role in both L1 and L2 language acquisition, it might have an effect in the rate of acquisition. It is argued that the more salient a form is, the easier it will be to acquire. Therefore, an issue that we must discuss is whether there are perceptual differences between /n/ and /s/. Both /n/ and /s/ have just one morpheme and none have a vowel. Therefore, they share the same number of phonemes and syllabicitiy. However, following the sonority hierarchy of Laver (1994, p. 504), we found that in a sonority scale of nine points, /n/ is more sonorous than /s/, showing a sonority of 4 and 3 respectively. Hence, /n/ and /s/ do not have the same sonority, but the difference in sonority between each sound is not much. Because both sounds have similar, although not identical, perceptual saliency, and because, overall, learners show not to have difficulties with the plural morpheme –s, I maintain that the differences found between English and Spanish learners are
probably related to the morphological richness of the verbal system rather than to the perceptual saliency of the inflection.

Another issue that arises from these cross-linguistic findings is whether the difference between the Spanish and English prosodic structure might have explained English learners difficulties with inflection. In order to test the soundness of this approach, I evaluated the effects of the verb structure (i.e. short-stem vs. long-stem) and the adjacent context (resyllabication vs. no-resyllabication). The findings obtained do not allow to draw a definitive answer. In the production task, neither the type of verb stem nor the adjacent context appears to explain learners’ difficulties producing verbal inflection. However, the prosodic structure might have affected comprehension, but the effect seems to be limited to the type of adjacent context (i.e. to whether the inflection syllabified with the adjacent sound). Therefore, because of the data at hand and because the experimental design did not exhaustively test the predictions made by the PHT, we cannot make a strong claim in favor of (or against) the PTH.

In addition to looking at the effects of the language structure, I also evaluated whether we could relate learners’ performance to the morphological structure of the language rather than to other non-linguistic factors, such as the learner’s proficiency. Although the learners’ proficiency was not tested in a formal way in the study, both groups of learners were highly comparable in terms of age of acquisition and time of exposure. Also, both groups were enrolled in similar immersion programs. In both programs, 90% of the classes were taught in the target language (i.e. all but one class was taught in the target language, either Spanish or English). Regarding children’s exposure to the target language outside school, it was assumed that children were mostly (or exclusively) exposed to their native language when they were not at school. In the
case of the Spanish learners, all parents reported that they only (or mainly) speak English at home. Additionally, the school is located in a medium size town with a small Hispanic population (1.07%). Therefore, we could assume that children’s exposure to Spanish outside the school was very limited. As for the L2 English learners, they reported speaking mainly Spanish at home. It is worth mentioning that because of the political relationship between the island and the United States, English as well as Spanish are the official languages of the island. However, in Puerto Rico most families speak Spanish at home (95% according to Census 2010). English language presence is mostly through the media. Many families have cable TV, therefore, children may be exposed to English through TV programs and movies. Hence, it is possible that the English learners had more exposure to the target language outside the school than what the Spanish learners had. However, because all children lived in a place where the dominant language was their first language (i.e. Spanish or English) we could assume that both groups had similar amounts of exposure to the target language. For the purpose of the study, I assumed that the two groups had similar language proficiency, but this was not formally tested.

The main claim made here is that those learners who acquire a richly inflected verb system will have more opportunities to access their morphological knowledge than those who are acquiring an impoverished verb system and that they will offer more evidence for T and Agr markings. Spanish learners are provided with multiple contexts that require them to access their morphological knowledge. In Spanish not only do verbs carry inflections but articles, nouns, and adjectives do too. For instance, in a sentence like Las niñas bonitas cantan (‘The pretty girls sing’), a mark of plurality is present in the article (-s) in the noun (-s), in the adjective (-s), and in the verb (-n). Therefore, when a child hears or produces a sentence like this, he or she has to
engage in inflection processing multiple times. Moreover, all Spanish verbs need to be inflected for person and number as well as for tense and mode. Hence, when a speaker is producing a sentence, she not only has to access her morphological knowledge in a vertical way but also in a horizontal way. See Figure 6.1, left. That is, within the sentence, the learner encounters multiple inflections that mark agreement but also within the verb paradigm, learners are presented with a richly inflected verb paradigm. By contrast, in English the sentence *The pretty girls sing* only marks plurality in the noun (i.e. girl-s) and the verb does not have any mark either for person or number. Only the 3rd person singular carries a verbal inflection (e.g. *The pretty girl sings*).

Hence, the opportunities for inflectional access are limited and learners are not provided with many opportunities to be engaged in morphological processing or such a robust evidence either vertically or horizontally (See Figure 6.1, right)

<table>
<thead>
<tr>
<th>Spanish</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verb: <strong>Cantar</strong> (to sing)</td>
<td>Verb: <strong>to sing</strong></td>
</tr>
<tr>
<td>canto</td>
<td>sing I</td>
</tr>
<tr>
<td>cantas</td>
<td>sing You</td>
</tr>
<tr>
<td>La niña bonita</td>
<td>The pretty girl</td>
</tr>
<tr>
<td>canta</td>
<td>sings He/she</td>
</tr>
<tr>
<td>cantamos</td>
<td>sing We</td>
</tr>
<tr>
<td>Las niñas bonitas</td>
<td>The pretty girls</td>
</tr>
<tr>
<td>cantan</td>
<td>sing They</td>
</tr>
</tbody>
</table>

Figure 7.1: Morphological processing axes: the figure in the left illustrates the Spanish morphological processing axes while the figure in the right illustrates the English morphological processing axes.
Additional support for the effects of the morphological structure in the rate of acquisition comes from the connectionist approach. Plaut and Gonnerman (2000), following the connectionist model, created two artificial languages. One of the languages was a morphologically rich language that resembled the Hebrew morphological system and the other was a morphologically poor language that resembled the English morphological system. In two different simulations, the connectionist network was trained in either the richly inflected language or the poorly inflected language. One of the main findings in Plaut and Gonnerman was that the network trained in the richly inflected language acquired the language faster than that trained in the morphologically impoverished language. If these findings are translated to human language acquisition, it would help explain why verbal morphology of highly inflected languages seems to be acquired at a faster rate than that of poorly inflected languages.

A question that arises from this discussion is how humans process morphemes, in particular, how child L2 learners actually process morphemes. One of the main approaches to morphological processing is Pinker and colleagues’ Words-and-Rules theory (Pinker 1994; Pinker & Ullman 2002; Pinker & Prince 1988), The Words-and-Rules theory (WR) claims that regular and irregular verb forms are treated distinctively by the speaker. Irregular forms are argued to be stored in the speaker’s memory while regular forms are generated by a rule that suffixes the verb ending to the verb stem (Pinker & Ullman, p. 456). The WR theory was advanced further in Ullman (2001). Ullman investigated the neural bases of regular and irregular verb form processing. In his approach, Ullman proposes that irregular and regular verbs are linked to two distinct grammatical processes: lexical storage and morphological decomposition.
These processes are treated differently by the brain and are associated with two types of memories (e.g. declarative and procedural memory).

In L1 processing, irregular verb forms are assumed to be stored in the speaker’s lexicon and regulated by declarative memory. Declarative memory has been related to knowledge about facts and events and it has been rooted in the temporal lobes of the brain structure. Knowledge stored in declarative memory can be recollected in an explicit way. By contrast, regular forms are assumed to be formed by morphological decomposition. This rule-based process depends on procedural memory. Procedural memory, which is located in the frontal/basal-ganglia structures, is linked to the acquisition of motor and cognitive skills and habits (Ullman, p. 106). Knowledge stored in this type of memory tends to be more automatic and unconscious, and it is commonly related to the speaker’s implicit knowledge.

Studies done with L2 learners have found that native speakers and L2 learners’ reliance on these two memory systems (i.e. declarative/procedural memory) is different (Clahsen & Felser 2006; Clahsen & Neubauer 2010; Silva & Clahsen 2008). When it comes to regular verbal forms, natives depend on the procedural memory, whereas L2 learners depend more heavily on their declarative memory. This finding has led researchers to suggest that L2 learners engage less in morphological decomposition and show more preference for lexical storage than native speakers do. These studies have also found that morphological processing in L2 learners is slower than in native speakers. Therefore, we can assume that morphological processing in adult L2 learners is qualitatively and quantitatively different from that of native speakers. Regarding morphosynactic processing in child L2 learners, the reported findings suggest that it does not parallel that observed in adult L2 learners. Instead, it has been found that child L2 learners are...
quantitatively, but not qualitatively, different from L1 speakers. Marinis (2007) analyzed online morpho-syntactic comprehension of English passives in a group of child L2 learners and found that learners showed longer reaction times, but, nevertheless, they showed the same patterns as those observed in L1 children. Similar findings were reported in Marinis (2008) where child L2 learners’ online comprehension of English reflexive pronouns was evaluated and found to be qualitatively similar to that of the groups of L1 children. These findings, although limited in the sense that they are not focused on inflectional processing, suggest that morpho-syntactic processing in child L2 acquisition better resembles that of L1 acquisition rather than that observed in adult L2 acquisition.

Phillips (1995/2010) mixed competence-performance model for L1 acquisition argues that L1 children’s difficulties are related to difficulties learners experience in accessing and merging the verb and the inflectional feature. He also claims that the morphological structure of the language may facilitate or delay the automatization of inflectional access. If applied to L2 acquisition, we could assume that natives and child L2 learners process morphemes in a similar but slower way. In native speakers, the process of accessing and merging the verb and the inflectional feature is a more overlearned and automatic process. However, in child L2 learners, this same task may not yet be fully automatic and the cost of accessing an inflection may be greater than the cost of failing to realize it. The morphological richness of the target language may play a role in either accelerating or delaying the automatization of such process. This claim leads us to yet another question: How can a linguistic process become automatized? To answer this question, I will mainly refer to the work on automaticity in L2 acquisition.
DeKeyser’s Skill Acquisition Theory (1997) posits that at the beginning of the acquisition process, learners’ knowledge is declarative but with practice, it suffers a qualitative change and turns into procedural knowledge. Once knowledge has become proceduralized, it changes to become a faster and more automatic process. In relation to L2 automaticity, Segalowitz (2003) states that “once a mechanism is automatic it will process information very quickly and accurately, being immune to interference from other sources of information.” (p. 401). Therefore, the more automatic a process is, the more accurate we will expect the learner to be. Gaining automaticity, however, is not an abrupt process but rather a gradual one that has been related to practice. For instance, it has been found that reaction times and rate of errors in L2 learners decrease as a function of practice (DeKeyser 1997). That is, greater practice leads to shorter reaction times and fewer errors. Hence, the rate at which a process becomes automatized may be linked to how much practice a learner gets. The rationale behind this argument is that the more practice a learner gets, the more likely it is that her knowledge becomes highly automatized and, as a consequence, her performance will improve. The relation between automaticity, practice, and the learner’s performance is well described by DeKeyser (2001) as follows: “It appears that both rule automatization and increased speed of instance retrieval are responsible for the improvement in performance that results from large amounts of consistent practice” (p.150)

Keeping the above in mind, we could propose that the opportunities a learner has to practice inflectional access in the target language could play a role in her rate of acquisition. In the literature, practice is more commonly related to the planned, structured and explicit practice a speaker gets in the classroom or in a laboratory setting. However, if we understand practice as the opportunities a learner has to be engaged in certain linguistic processes, then we could
propose that in highly inflected languages, learners get more practice with the process of accessing and retrieving their morphological knowledge than those learning a poorly inflected language. If in richly inflected languages learners get more practice, we would expect morphological processing in these learners to become automatic at a faster rate that in those who are learning poorly inflected languages in which inflectional access would become automatic at a much slower rate. Speakers for whom inflectional access is more automatic, in turn, will be expected to be more accurate than those speakers for whom it is yet a rather slow process.

Processes that are done automatically are usually related to the speaker’s implicit knowledge. How, then, could we ascertain that the participants in the present study were relying on their implicit knowledge? In one of the most comprehensive proposals regarding language learning in adults and children, Bley-Vroman (1990) suggests that the mechanisms a child uses (e.g. domain-specific) in the process of acquisition are different from those used by adults (e.g. general problem-solving). Children are commonly assumed to use their implicit knowledge when learning the second language whereas adults tend to use their explicit knowledge (DeKeyser 2003). That is why children are usually better at learning the second language but adults are faster. Older learners, in contrast to young learners, tend to rely more on their analytical skills. For instance, Harley and Hart (1997) compared a group of early and late immersion students and found that the latter group showed to rely more on their language analysis ability than the former group. In the first grade group (i.e. early immersion group), children’s language analysis ability did not predict their proficiency level; however, in the group of children who started the immersion program in grade 7 (i.e. late immersion group), their analysis ability predicted their proficiency. Harley and Hart suggested that the early immersion students approached the tasks
(e.g. vocabulary recognition, listening comprehension) with a more holistic memory processing than the late immersion students who approached the tasks with a more analytic approach. In an earlier study, Kelmer Nelson and Smith (1989) had compared both types of approaches (i.e. Holistic approach vs. Analytical approach) and came to the conclusion that the “holistic processing may constitute a less resource-intensive, fallback mode of cognition that is especially associated with the lack of deliberate, strategic approach” (p. 132). In other words, when approaching tasks in the second language, young second language learners rely more heavily on their implicit knowledge. By contrast older learners tend to rely more on their explicit knowledge. Taken all together, one might conclude the young language learners who participated in the present study were relying more on their implicit knowledge when responding in both the production and the comprehension task.

Another proposal that takes into account quantitative differences across languages is that of Legate and Yang. In their proposal, they suggest that children use the input they are exposed to set the grammar of the language. The morphological system of the language will offer evidence that will reward or punish a [+T] or [+Agr] grammar. Quantitative differences can either accelerate or delay the process. Morphological paradigms that offer robust evidence rewarding a [+T] or [+Agr] grammar are expected to be learned at a faster rate than those with a scarce morphology. Although this model seems promising to explain the differences observed across languages, it is not clear how it would help explain the asymmetry between production and comprehension found in L1 and, as shown here, in L2 acquisition. If the child has already mastered the inflection in production but not in comprehension, then how could the model explain why the grammar has been set for one modality but not for the other. An argument in
favor of the viability of this model is that the asymmetry may be related to the demands imposed in the comprehension task and that there was some task effect. Although this claim seems valid, it will be hard to extend the same reasoning to the cases where comprehension preceded production. For this reason, despite the fact that Legate and Yang’s proposal is well-grounded, I am more inclined to suggest that learners’ difficulties with verbal morphology is related to some kind of processing difficulty the learner experiences in accessing morphological knowledge.

In sum, I conclude that the morphological structure of the language may have an effect on child L2 learners’ process of acquisition. Highly inflected paradigms facilitate the automatization of inflectional access in child L2 learners. The process of accessing, merging, and retrieving an inflected form will become automatic at a faster rate and, therefore, more accurate in highly inflected verb paradigms than in impoverished verb paradigms. Hence, in child L2 learners learning a richly inflected language, the rate of morphological acquisition will be faster than in those who are learning a poorly inflected language.

7.3.1 Performance Across Language Modalities. Another finding of the study was the asymmetry between learners’ performance in comprehension and their performance in production. Learners showed asymmetry in both directions: some were better in comprehension while others were better at production. In addition, it was found that the direction of the asymmetry may not be the same across languages. Learners may show an asymmetry direction in their L1 but another in their L2. However, this study found that although both production and comprehension are two different processes, it is generally assumed that a common grammar underlies both language modalities (Clark & Hecht 1983, Izumi 2003). Production and comprehension use the same systems of representations (Bates & MacWhinney 1989; Thornton
That is, when a speaker produces or interprets an utterance, he or she is using the same linguistic knowledge in both of these processes. If both language modalities use the same grammatical system, why, then, does a learners’ performance differ between task forms? The fact that production and comprehension imposed different demands on the learner may help explain learners’ performance. Processing load for production is considerably higher than for recognition or comprehension (Carroll 1999; Leveel 1978; Sharwood Smith 1996). If such is the case, then it is not surprising that comprehension in some learners was better than their production, in particular, because processing in L2 learners is slower than in native speakers. That is why some have proposed that comprehension tasks are better than production tasks at tapping into the learner’s knowledge (Bruhn de Garavito 200, Izumi 2003).

Although the processing load imposed by the task modality may explain learners’ performance, another possible explanation may be linked to the type of interactions that commonly take place in an immersion classroom setting. Overall, immersion students’ oral skills have been found to lag behind their listening and reading skills (Genesee 1994; Swain 2001). Researchers have pointed out that this might be linked to the fact that the opportunities immersion students have to engage in “sustained and extended discourse” are limited in an immersion class setting (Tedick 2012, p.40). Classroom research, has found that teachers in class mainly use display questions (e.g. what are the four seasons of the year?). These questions lack communicative quality because they are normally limited to assess whether or not the child understood what was said in the classroom. This communicative approach, Tedick says, “emphasized facts over explanations, reasons, and opinions” (p. 40). As a consequence, students’ creative use of the target language in class is minimal. We could then assume that the
opportunities immersion students have to practice their oral skills are fewer than their opportunities to use the language in comprehension.

In this regard, studies have found that practice in one language modality does not necessarily translate into the other modality (Dekeyser, 2009; DeKeyser 2007). DeKeyser (2009) points out that L2 learners must receive practice in both production and comprehension in order for them to show improvement in the two language modalities. In other words, input alone seems not to be sufficient to promote learners’ overall proficiency. Instead learners should be provided with opportunities to practice both their comprehension and oral skills in order for them to show a holistic linguistic improvement (DeKeyser 2007). In sum, one might attribute learners’ performance across tasks to the amount of opportunities they get to use the language in both language modalities to the processing demands imposed by production and comprehension or a mixture of these two factors.

The previous discussion would explain why some learners were better at comprehension than at production, but it does not necessarily explain why some learners and natives did better in production than in comprehension. This asymmetry may not be related to the language modality per se but to the demands imposed by the comprehension task. In order to correctly identify the number in the target items, the child had to be very attentive and listen carefully to the sentence. Attention spans in children can be limited if, for example, compared to most adults who can be attentive for longer periods of time. But more than showing shorter attention spans, memory spans have been reported to be shorter in children than in adults. Memory span increases with age from childhood to early adulthood (Hulme, Muir, Thomson, & Lawrence, 1984). One component of the working memory is the phonological memory or storage. This system (i.e.
working memory) is used to store and to manipulate verbal information. The capacity the child has for these tasks (i.e. storage and manipulation of verbal information) can affect his comprehension of language as well as his capacity to learn new vocabulary words (Gathercole, Willis & Baddeley 1992). Therefore, if we assume that memory span can vary across children, then their capacity to store and manipulate oral verbal stimuli can vary as well. Thus, the children who had greater memory spans could have had more success at retaining the information carried by the verbal inflection and could have been more successful than those with shorter memory spans. Because the comprehension tasks were demanding, children with short memory spans might have had difficulties identifying the number of the noun phrase. However, because a measurement for testing the children’s memory was not included in the experimental design, we were not able to test this hypothesis. Another factor that could have played a role was that the task required the use of metalinguistic knowledge. As it was discussed previously (See Chapter 1), metalinguistic knowledge in children is less developed than in adults. A follow-up study with adults might offer some insight into the role played by metalinguistic knowledge.

**7.3.1.1 Performance Across Tasks: Cross-Linguistic Differences.** An issue that I have not yet addressed but that emerged in the results is the observed differences in the groups’ performance across task modalities. Overall, the Spanish L2 learners were highly successful at supplying the inflection, although some were not able to reach a native-like level of performance in production. Moreover, they did perform similarly to the native group in the comprehension task. Nevertheless, similar to natives, overall they tended to score higher in production. By contrast, the English L2 learners performed significantly different from the native group in both the production and the comprehension task. In addition, they do not show a clear tendency. Half
of the participants scored higher in comprehension while the other half scored higher in production. That is, the Spanish L2 learners showed asymmetry between their performance in production and comprehension, but the English L2 learners, although they showed asymmetry, performed almost equally poorly in both modalities. This difference between the groups of learners may be related to the amount of opportunities children get to practice their morphological knowledge and their rate of acquisition.

Grüter (2005)’s study about French clitic acquisition may offer some insight into the across tasks differences found between Spanish and English child L2 learners. In the study, Grüter compared the use of French clitics between a group of children learning French as their L2, a group of children with specific language impairment (SLI), and a group of monolingual francophone children. Both production and comprehension of French accusative object clitics were tested. Object clitics were elicited through a picture elicitation task. The comprehension of clitics was accessed through a sentence-picture matching task which presented three conditions to the child: the lexical condition (Luc plonge le camion dans l’eau ‘Luc is plunging the truck into the water’), the clitic condition (Luc le plonge dans l’eau ‘Luc is plunging it into the water’), and the intransitive condition (Luc plongue dans l’eau ‘Luc is diving into the water’). Results from the production task revealed that both the L2 and the SLI group showed high rates of omission. In the comprehension task, although the L1 group did better, no statistical significance was found between the three groups. That is, all groups performed similarly in the tested conditions. These findings suggest that both L2 learners and children with SLI are able to interpret and assign meaning to clitics despite their difficulties in production. However, in this study, individual results showed a pattern different from that of group results. When the
performance of the children was analyzed individually, it was found that those L2 learners who frequently produced clitics were also successful in the comprehension task. On the other hand, those children who did poorly on the production task were also the ones who did highly poorly in the comprehension task. Therefore, in this study, a correlation between learners’ performance in production and comprehension tasks seems to be evident. That is, if learners are successful in production, they will also be accurate in comprehension. At the level of the group results, the author proposed that “L2 learners as a group are capable of distinguishing between sentences that differ minimally by the presence or absence of an object clitic […] which suggests that this part of their L2 grammar is unlikely to be affected by an underlying deficit” (p. 382). In other words, it was concluded that this part of the child L2 learner’s grammar was not impaired. As for the individual results, Grüter proposed the existence of two stages. In stage 1, learners have not yet acquired the representation of clitics; during this stage, it may be claimed that the learner’s grammar is impaired. At stage 2, representation of clitics has been acquired and claims of impairment are no longer borne out. These findings led Grüter to conclude that “[…] a representational deficit, at least with regard to object clitics, cannot be a permanent characteristic of L2 grammars” (p.384).

Taking Grüter’s proposal into account, I suggest, although tentatively, that the child L2 learners of Spanish were already in stage 2. In these children, the representation of Spanish verbal agreement inflection seems to have been already acquired. However, in order to identify possible developmental stages in verbal morphology acquisition in child L2 learners, we would need to do a longitudinal study where verbal morphology acquisition in child L2 learners of Spanish could be studied across time. In contrast to the Spanish child L2 learners, the child L2
learners of English were possibly in stage 1. That is, they have not yet acquired the representation of the verbal inflection. Indeed, longitudinal studies on child L2 learners of English have reported that the acquisition of verbal morphology is quite gradual. Children start with high percentages of omission. They gradually improve and more frequently produce verbal inflection. As it was discussed above, the richness of the verb paradigm may play a role in either facilitating or delaying the rate of acquisition in L2 learners. In English L2 learners, the rate of acquisition is expected to be slower than in Spanish L2 learners. That is why it may take longer for the inflection to become productive and for learners to acquire the representation of the verbal agreement inflection in English. With more exposure and more opportunities to practice inflectional access in English, we could expect child L2 learners of English to improve, show higher levels of accuracy and reach stage 2.

In sum, taking all the findings together, I propose that in Spanish L2 learners (as a group), production precedes comprehension similar to what has been reported in L1 acquisition. However, in child L2 learners of English, the inflection might be equally problematic in production and comprehension. In these children (as a group), the inflection may not yet be highly productive in either of the language modalities. As discussed before, production preceding comprehension could be explained by the nature of the task (e.g. metalinguistic knowledge). Similar explanations have also been given in L1. However, in those learners who scored higher in comprehension, especially in English L2 learners, this may suggest that they indeed can comprehend and are sensitive to the verbal inflection, but they have difficulties at the moment of producing it. This will align more with what has been found in L2 acquisition. Nevertheless, it must be acknowledged that with the data at hand, it is not possible to draw any firm conclusion.
about the asymmetry displayed by the learners. Future research, as it will be discussed in a following section, will be able to offer further insight into learners’ performance across language modalities.

7.4 Implications for L2 Acquisition and for the Acquisition of Morphology

The present study has several implications for the field of language acquisition, more precisely, for the field of second language acquisition and the acquisition of morphology in child L2 learners. First it suggests that there may be some parallelism between verbal morphology acquisition in L1 acquisition and verbal morphology acquisition in child L2 acquisition. In both, the morphological structure of the language seems to play a role in the process of acquisition. In L1 children who are learning a highly inflected system, the mastering of the verbal inflections happens at a faster rate than in those children who are acquiring a poorly inflected language. The findings reported here for child L2 learners also suggest that L2 learners acquiring a highly inflected system (e.g. Spanish) will acquire the verbal system of the target language at a faster rate than those learners who are acquiring a poorly inflected language (e.g. English). This has implications for the theories on how learners acquire the morphological systems of the L2.

Since Chomsky’s proposal in the late fifties (Chomsky 1957), research on language acquisition has been mainly concerned with identifying whether and to what degree learners had access to universals (e.g. functional features). Although this theoretical approach has led to great advances in the field of second language acquisition, there are some phenomena that it has not yet explained in a compelling way; morphology acquisition is one of these phenomena.
Those who have looked at morphology acquisition in L2 learners have noticed that learners’ syntactic knowledge and their success with morphemes do not necessarily go hand in hand. Learners may be more successful with the syntax of the target language than with its morphology (Haznedar & Schwartz; Ionin & Wexler 2002; Lardiere 1998; Prévost & White 2000). For instance, Lardiere (1998) recognizes that there may be asymmetry between learners syntactic and morphological knowledge and proposes that mastering of the syntax in L2 learners may precede that of the morphology. She further explains that learners’ problems with morphology are due to mapping problems rather than to their linguistic knowledge per se. In a similar approach, Haznedar & Schwartz (1997) advanced the MSIH that argues that learners’ problems with morphology derive from processing problems. These approaches seem to suggest that there may not be a problem with the learner’s linguistic representations but that some other factor (e.g. mapping or processing problems) hinders learners’ production of inflectional morphemes. However, it is not clear what are these mapping or processing problems or why they emerge.

The results from the present study, as well as ideas that come from the connectionist model, may offer some insight into this matter. The connectionism model highlights the importance that the regularity and consistency of the system may have in understanding language acquisition in learners. More precisely, it claims that paradigms that are regular and consistent are acquired at a faster rate than those that are less transparent (Ellis N. 2002; Plaut and Gonnerman 2000). Regularity and consistency make linguistic cues more reliable and less ambiguous to the learner and, therefore, easier to acquire. According to Ellis this would explain why “noisy” and “inconsistent” morphological systems are harder to acquire.
If we extend these claims to the results obtained in the present investigation, they would help us explain why those learners learning Spanish, a language with a richly and consistent inflected verbal system, were more accurate than those who were learning English, a language with a poorly and inconsistent verb paradigm. Under the connectionism approach, these results would be expected because it is predicted that regular and consistent systems would be acquired at a faster speed than those that are irregular and inconsistent. Thus the connectionism model seems promising at explaining morphological acquisition in L2 learners. This, however, does not mean that the postulates of the generative approach cannot adequately explain language acquisition in L2 learners, but that there may be more to L2 learners’ acquisition than having or not having access to the features or linguistic representations of the L2. As Legate and Yang suggest:

“[…] both the input data and the mechanism by which children internalize grammar on the basis of the input data be taken seriously in the generative approach to language acquisition” (p. 341)

Further, Legate and Yang advocate for the development of a theory of experience-dependent language learning. Thus, in explaining morphology acquisition in L2 learners, we need to take into account the input data learners are exposed to. Although learners can have the abstract representation, they still have to deal with the concrete reality of the language. For instance, both Spanish and English L2 learners may have the relevant functional features (e.g. Agr and T) in the grammar of the L2, but they still have the task of associating the phonological form of the verb (i.e. lemma) with its inflected forms. As Phillips proposes for L1 acquisition, L2
acquisition might adopt a variational learning approach. That is, researchers should aim to describe the grammatical representations that the learner has, but they should also consider the input and how it interacts with learners’ use of L2 morphology.

This leads us to another issue, that of restricting ourselves to one theoretical model to explain language acquisition in L2 learners. The complexities of language acquisition may be better understood if viewed and explained from a wide range of theoretical orientations rather than from a sole theoretical approach. A unique theory may not be able to explain every single detail of language acquisition, but rather theories about language acquisition may complement each other. Adapting a multi theoretical approach to studying language acquisition may help provide a more comprehensive view of language learning in L2 learners.

7.5 Limitations of the study and avenues for future studies

There are some limitations that need to be acknowledged and addressed regarding the present study. First, there was not a formal test to measures learners’ proficiency. Although both the English and the Spanish learning groups were highly comparable in terms of age, of acquisition and of time of exposure, it was not possible to determine with certainty whether the two groups had similar proficiency levels or whether within the groups, learners’ proficiency was similar. The soundness of the study’s claims would have been strengthened if a formal measure had been included. However, because of practical and logistical issues such as time limitation and participants’ availability, it was not possible to include a proficiency measurement in the study. In following studies, proficiency could be measured using measurements similar to those drawn by Unsworth (2008) which are specifically designed for child L2 learners.
Secondly, the experiment design only included offline tasks. However, it would have been ideal to include an online task, in particular, because picture-matching tasks have been claimed to put high demands on the child (Brandt-Kobele & Höhle 2010). Including an eye-tracking measurement might have offered valuable insight into the child’s processing in real time. This methodology, which is more commonly used in psycholinguistics, has been found to be promising in assessing young children’s linguistic knowledge because it puts low demands on the child (Brandt-Kobele & Höhle 2010). Studying children’s gaze patterns may uncover subtle distinctions involved in children’s comprehension that offline tasks are unable to do. According to Hendriks (2010), to offer a comprehensive understanding of children’s actual grammatical knowledge, studies should include both types of methodologies (i.e. offline and online tasks). Hence, in a future study, both offline and online tasks should be included in order to have a more comprehensive understanding of child L2 learners’ morphological knowledge and processing.

Thirdly, because of the nature of the comprehension task, I think it would have been desirable to include a measurement on children’s memory capacities. This might offer valuable insight into the asymmetry found between children’s performance in production and their performance in comprehension. Memory storage capacity can vary between children. If children were found to have a significant difference in their memory spans, I could have tested whether these differences had a relationship with children’s performance in the comprehension task.

Another study that could help explain learners’ performance in comprehension and across language modalities could be, as I mentioned before, a follow-up study with adults. The learner’s metalinguistic knowledge might have played a role in the comprehension task. Therefore, this
study would intend to discover whether adults who have greater metalinguistic knowledge show similar patterns to those displayed by the children.

In addition, child L2 acquisition is in need of longitudinal studies, in particular longitudinal studies in languages other than English. For instance, there are no longitudinal studies made on Spanish L2 acquisition by children. This type of study would offer valuable insight into the developmental patterns followed by child L2 learners and will help to answer important theoretical questions about the age effect as well as the effect that the target language may have in the acquisition process.

7.6 Practical Applications

Any study in second language acquisition has as an indirect or direct goal of contributing to improve language learning in L2 learners and offering findings that can translate into more effective teaching practices. In this regard, this study makes two major contributions. First, it draws attention to the role of practice in developing high levels of performance. Studies of immersion programs have found that after many years of exposure, non-target like forms may persist in immersion students’ production. Researchers relate this to the limited opportunities students are given to talk in class (Genesee 1994; Swain 2001). Swain (2001) mentions that in class, students’ productions are usually limited to one or two word utterances. Swain highlights the importance that the output has in helping develop students’ linguistic skills in the target language and states the following:

“Output, then, would seem to have a potentially significant role in the development of syntax and morphology, a role that underlies the functions output may have in the learning of a second language.” (p. 48)
Therefore, although immersion students comprehend most of the input they are exposed to in class, it is important for teachers to provide activities (e.g. collaborative tasks) that allow stretching students’ linguistic skills and promote them to be more accurate. That is, language teachers should not only focus on the content but also to the language and create activities that address both.

Secondly, the study uncovers how the morphological structure of the language interacts with learners’ performance and rate of acquisition. These findings suggest that the structure of the target language may play a role in the acquisition and some structures may be more difficult to acquire not because of the learner’s L1, for example, but because of some intrinsic characteristic of the target language. Therefore, we should not expect the same outcomes in learners learning different target languages. Namely, we should not expect learners learning a poorly inflected verb paradigm to be as accurate as those learning a highly inflected system at similar stages of acquisition. In the classroom, teachers should identify those contexts that are more problematic for learners and that are closely related to the structure of the target language. Once teachers identify a problematic structure, they could design activities that will provide learners with contexts where they can produce and practice these structures. Teachers can follow the teaching methodology describe in Lyster (2004) that consist of three steps: noticing, awareness and practice. First, teachers should create activities or materials for students to notice the linguistic structure (e.g. show students a document where the inflection is underlined or bolded). Next, students should become aware of the inflection. This can be done, for example, by designing an activity where students correct verbs with missing inflection. Finally, students should be offered opportunities to practice the relevant linguistic structure. For instance, students
could create a diary of the activities their pet usually does. For this, students will need to use the 3rd person singular –s. These activities are expected to help learners achieve higher levels of accuracy.
REFERENCES


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Yan, S and Nicoladis, E. (2009). Finding *le mot juste:* Difference between monolingulas and
monolinguals children’s lexical access in comprehension and production. *Bilingualism:*


Press.

159-180.
### APPENDIX A: PARTICIPANTS’ INDIVIDUAL RESULTS FOR THE SPANISH TASKS

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Table A.1: Spanish L2 learners’ linguistic background and results
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Table A.2: Spanish natives’ linguistic background and results
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Table B.2: English natives’ linguistic background and results
APPENDIX C1: SPANISH PRODUCTION TASK

Practice section

Expected response (ER): (Ellos) leen en la biblioteca ‘They read in the library’

ER: (Ellos) hacen ejercicios ‘They do exercise’
Experimental section

ER: (Ellos) ven televisión ‘They watch television’

ER: (Ellos) comen ‘They eat’

ER: (Ellos) botan/sacan la basura ‘They take out the trash’
ER: (Ellos) montan bicicleta ‘They ride bike’

ER: (Ellos) limpian el baño ‘They clean the bathroom’

ER: (Ellos) juegan fútbol ‘They play soccer’
ER: (Ellos) bañan al perro ‘They bathe the dog’

ER: (Ellos) corren en el parque ‘They run in the park’

ER: (Ellos) duermen en el sofá ‘They sleep on the sofa’
APPENDIX C2: SPANISH COMPREHENSION TASK

Practice section

1. Juega en el parque. ‘He/she plays in the park.’

2. Estudian en la biblioteca. ‘They study in the library.’

3. Caminan en la lluvia. ‘They sleep on the bed.’
Experimental section

Target 1
Form A: Ella sueña con una oveja. ‘She dreams with a sheep.’
Form B: Ellas sueñan con una oveja. ‘They dream with a sheep.’

Non-masked 1
Form A: Ella corre en las mañanas. ‘She runs in the mornings’
Form B: Ellas corren en las mañanas. ‘They run in the mornings’

Target 2
Form A: Ellas siguen a la señora. ‘They follow the lady.’
Form B: Ella sigue a la señora. ‘She follows the lady.’
**Target 3**

Form A: Ellas soplan las velas del pastel. *They blow the candles of the birthday cake.*
Form B: Ella sopla las velas del pastel. *She blows the candles of the birthday cake.*

**Non-masked 2**

Form A: Ella pinta en la clase de arte. *She paints in the art class*
Form B: Ellas pintan en la clase de arte. *They paint in the art class*

**Filler 1**

Form A & B: Ve televisión. *He watches television*
Target 4
Form A: Ella salta la cuerda ‘She jumps rope.’
Form B: Ellas saltan la cuerda ‘They jump rope.’

Target 5
Form A: Ella sube la montaña. ‘She climbs the mountain.’
Form B: Ellas suben la montaña. ‘They climb the mountain.’

Non-masked 3
Form A: Ellos comen en las tardes. ‘They eat in the afternoons’
Form B: Él come en las tardes. ‘He eats in the afternoons’
Filler 2
Form A & B: Juegan en el parque. ‘They play in the park’

Target 6
Form A: Ellas sonríen a la cámara ‘They smile to the camera.’
Form B: Ella sonríe a la cámara ‘She smiles to the camera.’

Non-masked 4
Form A: Ellos toman leche en la noche. ‘They drink milk in the night’
Form B: Él toma leche en la noche. ‘He drinks milk in the night’
Target 7
Form A: Ella saluda al señor. ‘She greets the Mister.’
Form B: Ellas saluden al señor. ‘They greet the Mister.’

Non-masked 5
Form A: Ellos cantan una canción. ‘They sing a song’
Form B: Él canta una canción. ‘He sings a song’

Target 8
Form A: Ellas salen de la tienda. ‘They exit the store.’
Form B: Ella sale de la tienda. ‘She exits the store’
Form A & B: Baila en la fiesta. ‘She dances at the party.’

Form A: Ella saca la basura. ‘She takes out the trash.’
Form B: Ellas sacan la basura. ‘They take out the trash’

Form A: Ella toca la guitarra. ‘She plays the guitar’
Form B: Ellas tocan la guitarra. ‘They play the guitar’
Target 10

Form A: Ellas silban en la oficina. ‘They whistle in the office.’

Form B: Ella silba en la oficina. ‘She whistles in the office’
APPENDIX D1: ENGLISH PRODUCTION TASK

Practice section

ER: He washes the dishes.

ER: He watches TV.

Experimental section

He bakes cookies.
ER: He mows the lawn.

ER: He vacuums the floor.

ER: He rides his bike.
ER: He plays basketball.

ER: He talks on the phone.

ER: He drinks coffee.
ER: He cleans the floor.

ER: He reads the newspaper.

ER: He waters the flowers.
APPENDIX D2: ENGLISH COMPREHENSION TASK

Practice section

1. The lady is skiing

2. The girl is swinging.

3. The boys are on the sleds.
Experimental section

Target 1
Form A: The skunk stinks in the grass.
Form B: The skunks stink in the grass.

Non-masked 1
Form A: The kids play in the sand.
Form B: The kid plays in the sand.

Target 2
Form A: The cats sleep on the bed.
Form B: The cat sleeps on the bed.
Target 3
Form A: The cops smoke in the street.
Form B: The cop smokes in the street.

Non-masked 2
Form A: The dogs bark in the park.
Form B: The dog barks in the park.

Filler 1
Form A & B: The girl is taking a nap.
Target 4
Form A: The rabbits smell the flower.
Form B: The rabbit smells the flower.

Target 5
Form A: The cook stirs the soup.
Form B: The cooks stir the soup.

Non-masked 3
Form A: The girl folds the towels.
Form B: The girls fold the towels.
Filler 2
Form A & B: The children are in the pool.

Target 6
Form A: The elephants spill the paint.
Form B: The elephant spills the paint.

Non-masked 4
Form A: The boy writes a letter.
Form B: The boys write a letter.
Target 7
Form A: The ape swings in the tree.
Form B: The apes swing in the tree.

Non-masked 5
Form A: The girl plays soccer.
Form B: The girls play soccer.

Target 8
Form A: The ducks swim in the water.
Form B: The duck swims in the water.
**Filler 3**
Form A & B: The lady is talking on the phone.

**Target 9**
Form A: The goat stands behind the fence.
Form B: The goats stand behind the fence.

**Non-masked 6**
Form A: The koalas climb the tree.
Form B: The koala climbs the tree.
Target 10
Form A: The students sweep the floor.
Form B: The student sweeps the floor.
APPENDIX E: SPANISH VERBS FREQUENCY*

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<tbody>
<tr>
<td>ponen (to put)</td>
<td>36.54</td>
<td>corren (to run)</td>
<td>11.60</td>
<td>montan (to ride)</td>
<td>2.01</td>
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<tr>
<td>toman (to take)</td>
<td>21.36</td>
<td>comen (to eat)</td>
<td>8.14</td>
<td>limpian (to clean)</td>
<td>1.54</td>
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<tr>
<td>miran (to watch)</td>
<td>16.60</td>
<td>duermen (to sleep)</td>
<td>4.46</td>
<td>nadan (to swim)</td>
<td>0.74</td>
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<tr>
<td>juegan (to play)</td>
<td>14.46</td>
<td>lavan (to wash)</td>
<td>2.20</td>
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Table E.1: Spanish production task

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<tr>
<td>Seguir (to follow)</td>
<td>152.50</td>
<td>Saltar (to jump)</td>
<td>14.00</td>
<td>Silbar (to whistle)</td>
<td>1.60</td>
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<tr>
<td>Salir (to exit)</td>
<td>147.10</td>
<td>Soñar (to dream)</td>
<td>11.00</td>
<td>Sonreir (to smile)</td>
<td>.20</td>
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<tr>
<td>Sacar (to take out)</td>
<td>55.00</td>
<td>Saludar (to greet)</td>
<td>8.10</td>
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<tr>
<td>Subir (to go up)</td>
<td>34.90</td>
<td>Soplar (to blow)</td>
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Table E.2: Spanish comprehension task

*Verbs’ frequency was looked in CREA corpus and word frequency list in La Real Academia Española. A Pearson’s analysis was carried out with average accuracy and verbs frequency as variables and the analysis revealed that the frequency of the verb was not related to learners’ accuracy in producing \((r(11) = .27, p > .05)\) or comprehending the verbal inflection \((r(10) = -.384, p > .05)\)
APPENDIX F: ENGLISH VERBS FREQUENCY*

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Table F.1: English production task

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<td>sweep</td>
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<td>stink</td>
<td>0.00</td>
<td></td>
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</tr>
<tr>
<td>spill</td>
<td>2.00</td>
<td>swing</td>
<td>0.00</td>
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</table>

Table F.2: English comprehension task

*Verbs’ frequency was looked in the Frequency Analysis of English Usage word frequency list (Francis & Kučera, 1982). A Pearson’s analysis was carried out with average accuracy and verbs frequency as variables and the analysis revealed that the frequency of the verb was not related to learners’ accuracy in producing \( r (9) = .128, p > .05 \) or comprehending the verbal inflection. \( r (10) = .315, p > .05 \).
APPENDIX G: LANGUAGE BACKGROUND QUESTIONNAIRE

Child’s name (First, Last) ________________________________________
Child’s age _______ years ______months Sex (M / F )

1. Which is your native language? What other languages do you speak other than your native language?

2. What language or languages do you or other family member speak at home with your child?

3. Where has your child lived, and what age was he/she at the time (starting with place of birth)?
   Place (City, Area, Country) Ages (From…. To….)

4. At what age did your child begin learning Spanish?

5. How long has your child been studying Spanish?

6. Has your child been diagnosed with speech/language impairment or an auditory problem?