Temporal interface delay and root nonfinite verbs in Spanish-Speaking children with specific language impairment

Evidence from the grammaticality choice task

John Grinstead, Juliana De la Mora, Amy Pratt and Blanca Flores*
The Ohio State University, El Instituto Nacional de Rehabilitación*

Existing research into specific language impairment in Spanish utilizes primarily spontaneous production data and concludes that children do not have problems with verb finiteness. In contrast, we show, through a new receptive measure, the "Grammaticality Choice Task", that the distribution of the 2 most common errors in child Spanish is sufficient to distinguish language-impaired children from age and language control groups. We conclude that finiteness marking on verbs is a promising clinical marker for SLI in Spanish and that spontaneous measures of finiteness marking do not provide the most accurate representation of children's grammatical competence in the verbal domain in a null subject language such as Spanish.

Keywords: finiteness, tense, SLI, child language, Spanish, Grammaticality Choice Task, grammaticality judgment, optional infinitive.

1. Introduction

A great deal of research over the last decade has focused on explaining the phenomenon of root nonfinite verbs or "Optional Infinitives" (Wexler 1990, 1994, 1998). This phenomenon consists of the observation that child speakers of English, for example, use both finite and nonfinite versions of the same verbs at the same point in development, as in *He walk across the street.* and *He walks across the street.* Spontaneous production studies of finiteness marking on verbs in child Spanish (Grinstead 1994), Catalan (Torrens 1995, Bel 2001) and Italian (Guasti 1994) have concluded that there is little or no evidence for the existence of an "Optional

Infinitive" stage in these Southern Romance, null subject languages. The observations made in these studies come from transcripts of longitudinally collected spontaneous production. While studies of these corpora have provided much insight into the development of child Southern Romance, they have generally not taken into account critical obstacles to measuring finiteness marking in null subject languages with tense-agreement morphology which is portmanteau, i.e. multiple grammatical dimensions are represented in one non-segmentable morpheme.

Studies of language impairment in Southern Romance languages, however, have advanced understanding in the field greatly by not limiting themselves to spontaneous production data, though they nonetheless frequently adopt, from the study of typical language development, the mistaken assumption that root nonfinite verbs must be morphological infinitives only (e.g. Bedore & Leonard 2005; Bortolini, Caselli, Deevy & Leonard 2002; Leonard & Bortolini 1998; Leonard, Caselli & Devescovi 2002).

In what follows, we will attempt to convince the reader that forms other than the morphological infinitive should be counted as root nonfinite verbs in child Southern Romance, as they are in the adult languages, and that spontaneous production data is not the best source of information on verb finiteness in null subject languages. Rather, receptive measures of children's language competence are more appropriate means of answering the question of whether or not there is an optional infinitive stage in child Spanish (and the other null subject Southern Romance languages by extension). We will then reanalyze existing results and present the results of a new receptive language experiment, the Grammaticality Choice Task, in an attempt to show that these measures of verb finiteness in child Spanish are sufficient to distinguish affected children from age and language-matched controls. In this fashion, we suggest that in child Spanish, as in child English (cf. Rice & Wexler 1996; Rice, Wexler & Hershberger 1998; Rice, Wexler & Redmond 1999), tense is a promising clinical marker of specific language impairment. Finally, we discuss the consequences of these findings for current theoretical accounts of the Optional Infinitive stage and argue that the phenomenon is best subsumed under the general cognitive developmental phenomenon of Interface Delay between syntax and pragmatics, as argued for in Grinstead (2004).

2. Spontaneous production studies of nonfinite verbs in Southern Romance

Research into the existence of root nonfinite verbs in typically-developing child Catalan (Bel 2001, Grinstead 1994, Torrens 1995), Spanish (Grinstead 1994) and Italian (Guasti 1994) has concluded that there are very few root nonfinite forms used, especially in comparison with the overt subject languages of German, French,

Dutch and English, in which the original observation of an "Optional Infinitive" stage was made by Wexler (1990, 1994, 1998) and others. In English, the phenomenon consists of verbs optionally produced with finiteness marking in main clauses, as in 1 and 2.

(1) He walk across the street every day.
(2) He walks across the street every day.

However, there has never been consensus in the study of Southern Romance languages as to which forms constituted an analogue of the optional infinitive verbs found in other languages. Most studies searched for actual morphological infinitives, as in the Spanish examples in 3–5 (from Grinstead 1998), however they were not found in large numbers. In Grinstead (1994), however, it was argued that a larger array of nonfinite forms should be considered, including most especially bare stems, as in 6–13 (also from Grinstead 1998). Note that the classic nonfinite form for English was the bare stem, and not an infinitive[1], as in 1.[2]

Morphological Infinitives

(3) Carlos – 2;2.7
Payaso venir.
clown come inf
"Clown come."

(4) Graciela - 2;3.11
Bañar.
bathe inf
"Bathe."

(5) Eduardo - 2;8.26
Pintar.
paint inf
"Paint."

1. The use of the term "infinitive" has proven misleading in English because it conjurs up the "to speak" citation form, which children do not use in root clause contexts. From what we can tell, this same misleading connotation appears to have been carried over to Southern Romance languages, causing researchers to only look for morphological infinitives instead of the much larger array of verb forms which have the property of being nonfinite.

2. Though it has also been long recognized that there are other root nonfinite forms in English (e.g. Vainikka 1993, Schütze 1997).

Bare Stems

(6) Carlos - 3;3.28
Yo pone.
I-nom put (root + "e" theme vowel)
"I puts."

(7) Eduardo - 2;0.14
Es yo.
Copula 3rd stem I-nom
"Is I."

(8) Eduardo - 2;2.0
Es tú.
Copula stem you-nom
"Is you."

(9) Eduardo - 3;0.28
Yo quiere hacerlo.
I want (root + "e" theme vowel) do-inf cl-acc-sg-masc
"I wants to do it."

(10) Carlos - 2;1.08
Va yo.
go stem I-nom
"I goes."

(11) Carlos - 3;3.28
Yo va a buscar.
I-nom go stem to look for-inf
"I goes to look for."

(12) Graciela - 2;6.5
Hace esto yo.
do (root + "e" theme vowel) this I-nom
"I does this."

(13) Graciela - 3;3.26
Este, yo quiere.
this, I-nom want (root + "e" theme vowel)
"This, I wants."

Note that while the morphological root of a verb in English is the same as the stem, the root in Spanish is actually not pronounceable within the constraints of Spanish phonotactics, without the addition of a theme vowel (cf. Harris 1991).

The picture is further clouded by the fact that the bare stem form in 14 is homophonous with numerous other verb forms including the 2nd person singular familiar imperative (as in 15), the impersonal (as in 16) and the 3rd person singular present indicative (as in 17).

Bare Stem

(14) Habla.
speak (root + "a" theme vowel)
"Speak."

Imperative

(15) Habla.
speak 2nd sg. fam. imperative
"Speak."

Impersonal

(16) Se habla.
cl.-impers. speak (root + "a" theme vowel)
"One speaks."

3rd Singular Present Indicative

(17) Habla.
speaks 3rd singular present (progressive or habitual)
"He/she speaks." – "He/she is speaking"

The verb forms in 15 and 16 are particularly important because they are nonfinite in various ways. The imperative form, in 15, may inflect for person and number, but never for tense. All imperatives are inherently irrealis, or non-tensed. Conversely, impersonal expressions, such as the one given in 17, may inflect for tense, but never for person, and in fact may, in some dialects, optionally fail to inflect for number as the pair of examples in 18 and 19 illustrate.[3]

(18) Impersonal With Number Agreement
Se cortan árboles.
cl. imp. cut 3rd pl. trees
"Trees are cut."

3. Note that not all dialects accept this contrast. A similar phenomenon is documented for Northwest Catalan in Rigau (1991).

(19) Impersonal Without Number Agreement
Se corta árboles.
cl. imp. cut 3rd sg.. trees
"Trees are cut."

We see then that two of the three adult verb forms that adopt the phonetic form of a bare stem lack either tense (the imperative) or agreement (the impersonal), making them a priori good candidates for nonfinite verb forms in child language. Nonetheless, most researchers concluded that child speakers of Spanish and other Southern Romance languages were using the present indicative form in 17, not the nonfinite bare stem in 14, and that consequently their use of this form *without overt subjects* constituted adult-like indicative verb use. There are a number of factors that have allowed this dubious conclusion to persist.

The first has to do with the fact that tense and agreement in Spanish are frequently represented by portmanteau morphemes, i.e. morphemes that represent multiple grammatical dimensions without being segmentable into smaller units. In a reduced number of tense and agreement combinations ("conjugations") in Spanish, particularly in the plural, we find tense and agreement being represented by independent morphemes, as in 20 and 21.

Verbs Expressing Tense and Agreement With Independent Morphemes
(Tense = /ba – ra/, Agreement = /mos – n/)

(20) Cantá-ba-mos.
sing 1st pl. past-imperfect
"We were singing."

(21) Canta-rá-n.
sing 3rd pl. future
"They will sing."

However in the great majority of verb forms in Spanish, tense and agreement are expressed as portmanteau morphemes in which one segment or syllable (sometimes in combination with phonemic changes in suprasegmental features) represents both tense and agreement, along with mood and aspect. This is the case with the singular, present tense forms in Spanish, which are the earliest and most commonly used forms in child speech. This fact implies that without knowing whether there is agreement on a verb, one cannot know whether tense has been expressed. Because Spanish is a language in which overt subjects are only rarely explicit (e.g. to signal change of topic, switch reference, focus a subject, etc.), researchers studying transcripts of spontaneous production find themselves staring at mostly bare stem verbs, with no overt subjects. Many argue that, in spite of these difficulties,

the child's intended subject may be inferred from discourse, however, we must recognize that this inference is made on the basis of the adult's representation of discourse and that we have no means of accessing – at least when using only a transcript – children's discourse representations.

There are in fact cases in which the physical situation appears to indicate that children use bare stem forms to refer to themselves, as in the following[4]:

(22) Eduardo - 2;5.29
No puede.
Not can (root + "e" theme vowel)
"Cannot."
[Eduardo responds to the investigator's question of whether he can put two pieces of a puzzle together.]

(23) Graciela - 2;3.4
No quiere.
Not want (root + "e" theme vowel)
"Does not want."
[Graciela responds to mother asking her if she wants a band-aid.]

(24) Carlos - 2;9.15
Sí puede nadar.
Emphatic particle- can (root + "e" theme vowel) swim-inf.
"Can too swim."
[Carlos responds to investigator asking if he can swim "¿Puedes nadar?"]

Note also that sometimes children use non-third person singular pronoun overt subjects in conjunction with these bare stem forms, as in examples 6–13 above, making it seem unlikely that examples 22–24 are third person self-reference of the kind alluded to elsewhere in the child language literature (e.g. Daddy: "Daddy wants Bobby to finish his vegetables" Bobby: "Does Bobby have to?").

Finally, according to Bel (2003), Silva-Corvalán (1977) and others, roughly 80% of verbs in adult Spanish occur with a null subject. Similar or lower rates have been documented in children (Bel 2003, Grinstead 2004). In summary, given this last fact, researchers working with only spontaneous production data find themselves attempting to determine the finiteness of primarily bare stem verbs with overt subjects absent 80% of the time. This problem is made more acute because bare stems are easy to confuse with third person singular present tense forms and because, as in categorical perception in the domain of phonetics, adults, including researchers, tend to enrich the signal with their own background knowledge and

4. Note that the caveat regarding adult interpretations of children's discourse representations applies here, too.

assumptions regarding the plausible use of language. How many of the null subject, bare stem forms are actually nonfinite is impossible to determine, however it is likely that they consist of some mix of adult-like finite 3rd singular present forms and child language-specific nonfinite bare stem forms, most of which simply cannot be distinguished from one another in spontaneous production. In closing, it is worth noting that an increasingly large number of spontaneous production studies now argue that bare stems as nonfinite forms are present in child Spanish and Catalan, including Radford & Ploennig-Pacheco (1995), Davidiak & Grinstead (2004), Davidson & Goldrick (2003), Clahsen, Aveledo & Roca (2002), Liceras, Bel & Perales (2006) and Buesa (2006).

3. Elicited production studies of child Spanish

Beyond the fact that studies of spontaneous production in null subject languages present a greatly reduced number of opportunities to observe unambiguous cases of root nonfinites, they also suffer from the defect that children may use constructional idioms or "frozen forms" to express many of their ideas. In these cases, it seems likely that children are drawing fully inflected, morphologically unitary elements ("holophrases") from the lexicon, which probably tell us little about productive morphosyntax. For this reason, elicited production studies may serve as a clearer reflection of the grammatical competence of children because they present children with both the subject they must use and the verb which they must pair with the subject provided to form an agreement relationship. A number of such studies have been carried out in child Spanish and all suggest that bare stems and morphological infinitives may serve as nonfinite forms in child Spanish.

There are two studies which were carried out with monolingual child Spanish speakers in Spanish-speaking countries which followed the design of Berko-Gleason's (1958) "Wug Test" for verbs by providing children with invented verbs to conjugate. Pérez-Pereira (1989) presented children with the opportunity to change verbs into 3rd person past (preterit) and found that children made large numbers of errors, as illustrated in Table 1.

Table 1. Percentage Correct with Invented Verbs in Pérez-Pereira (1989)

	3 Year-olds	4 Year-olds	5 Year-olds	6 Year-olds
Past-preterite	32%	64%	71%	78%

Table 2. Percentage Correct with Real Verbs in Pérez-Pereira (1989)

	3 Year-olds	4 Year-olds	5 Year-olds	6 Year-olds
Past-preterite	48%	74%	73%	76%

Table 3. Elicited Production Errors from Bedore & Leonard (2001, Table 5)

	3 Year-olds	5 Year-olds
Total Errors	176	56
Total Possible	1186	1511
Percent Errors	15%	4%

Pérez-Pereira (1989) found slightly improved percentages with real verbs in a similar elicited production experiment, as illustrated in Table 2.

Kernan & Blount (1966) found similar results. Unfortunately, neither of these studies say much about what kinds of errors children produced and they only tested 3rd person singular.

However, Bedore & Leonard (2001) carried out a similar elicited production study with 3 and 5 year-old Spanish-speaking children in the US, but they elicited 1st and 3rd person, singular and plural, present and past tense verbs. The total percentages of errors produced by the typically-developing children in the study, compiled from Bedore & Leonard (2001), are given in Table 3.

As one might expect, if optional infinitives are as significant a phenomenon in Spanish as they are in English, the elicited production error percentages for 3 year-olds (range = 2;10 – 3;6) of Bedore & Leonard (2001) are similar to the percentages given in Rice, Wexler & Hershberger (1998) for 3 year-old (36 months old) typically-developing child English speakers. As shown in Table 3, three year-old child Spanish-speakers produced 15% errors, while the 3 year-old child English speakers in Rice et al (1998) produced errors between 20% and 40%. For the 5 year-old groups in both elicited production studies, the percentage of errors was near 5%.

4. Infinitives and bare stems

It is important to point out that Rice, Wexler and colleagues have long used a "composite" of morphological tense markers to measure child English proficiency with verbal finiteness. This composite includes 3rd singular *-s*, regular past tense *–ed*, copular and auxiliary *be* & *have* as well as *do*. This idea makes sense in English as there are a small number of relatively idiosyncratic finiteness markers and

looking at accuracy for each of them can be very revealing about what children know about finiteness. Adapting this idea to Spanish, however, we find dozens of possible finiteness markers for each verb, which makes looking at accuracy of individual forms impractical, though it has commonly been the approach adopted.

Given the impracticality of this approach, we opt instead for measuring children's sensitivity to their most commonly made errors, which appear to be produced with multiple possible target adult forms in Bedore & Leonard (2001). Given that the bare stem, as in 25, and the morphological infinitive, as in 26, are the most frequent errors found in both elicited production and spontaneous production studies of typically-developing children and children with SLI, we take them to be the best examples of children's root nonfinite verb use.

Bare Stems

(25) Carlos - 3;3.28
Yo pone.
I-nom put stem
"I puts."
Morphological Infinitives

(26) Carlos – 2;2.7
Payaso venir.
clown come-inf
"Clown come."

Consequently, we take the erroneous forms produced, and not their intended target, to be the most efficient and sensitive variables to consider.

5. Child Spanish and the unique checking constraint

In the most recent iteration of Wexler's influential work on root nonfinite verbs in child language, Wexler (1998) proposes the Unique Checking Constraint (UCC), which is cast in terms of formal syntactic theory. The UCC is a developmental constraint which is proposed to only apply to child language and to disappear as children mature. The constraint regulates the movement of verbs through the clause, as hypothesized in versions of Chomsky's (1995) Minimalist Program. The idea is that in order for a verb to be well-formed it must move from its original position in the syntactic hierarchy of the clause (as head of the VP projection) and come into local relationships by movement, called "checking", with two syntactic features ("D" features), sometimes postulated as independent functional projections: tense and agreement, as in Figure 1.

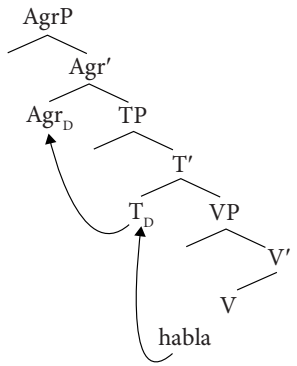

Figure 1. Verb Movement to Check D Features in Tense and Agreement

This is the case for the adult language at least, in which failure of a verb to move up in the syntactic hierarchy will produce an ungrammatical derivation. In child language, the UCC restricts children to checking only one of the two features which adults must check (D in tense and D in agreement). However, the result of a derivation which checks only one feature is a nonfinite verb, which accounts for the nonfinite verb forms children produce. The UCC works in concert with another constraint, *Minimize Violations*, which sometimes overrides the UCC and forces children to obey the rules of adult syntax, checking both tense and agreement D features, which accounts for the finite verb forms which children produce at a simultaneous point in development with the production of nonfinite verb forms (thus the name "Optional Infinitive").

Wexler (1998) considers a wide array of languages and how they can be accounted for by the UCC. In order to accommodate the mistaken generalization that child Spanish does not allow nonfinite forms, Wexler (1998) assumes that agreement is pronominal in Spanish, which follows the arguments of Rizzi (1986), Fassi-Fehri (1993) and Jelinek (1984) to the effect that subject-verb agreement in null subject languages acts as a kind of pronominal, making the expression of an overt subject unnecessary (see Ordóñez 1997 for details on such a proposal). Given this assumption, he stipulates that agreement in Southern Romance languages is D, as opposed to having a D feature. Given this set of assumptions, the Unique Checking Constraint and the Minimize Violations Constraint apply vacuously in Spanish, children have essentially adult-like grammars and no nonfinite forms are produced, contrary to the facts just presented. If bare stem and infinitive verbs are indeed grammatical nonfinite forms in child Spanish, as we will attempt to further

demonstrate, Wexler's UCC/Optional Infinitive account could be modified in a relatively straightforward fashion to accommodate this fact.[5]

But is this the best way to explain the Optional Infinitive phenomenon in typically-developing children or the Extended Optional Infinitive phenomenon in language-impaired children? The obvious problem with the account is its ad hoc and stipulative nature. It was designed not to account in a principled way for a range of phenomenon, but rather postulates two constraints which have no motivation other than solving the problem under consideration. Though the UCC does not appear to constitute as coherent a theoretical construct as one might hope for, Rice & Wexler's collaboration nonetheless constitutes a milestone for the field and has been very successful at demonstrating that finiteness marking in English is a very vulnerable dimension of grammar for children with specific language impairment (cf. Rice & Wexler 1996; Rice, Wexler & Hershberger 1998; Rice, Wexler and Redmond 1999). Given the universality of temporal representation for clauses, in spite of language-particular variation for its representation, it seems worthwhile to determine whether Spanish-speaking children with specific language impairment (SLI) might also have difficulty in this area, as a crosslinguistic cross-validation of the phenomenon. Consequently, in this study our questions will be:

- Can a receptive task overcome the obstacles posed by spontaneous production data for determining the pervasiveness of root nonfinite forms in child Spanish?
- If root nonfinite forms are pervasive in Spanish, can they be used to distinguish children with SLI from age and MLUw-matched control groups, as a first step towards determining the usefulness of finiteness as a clinical marker of SLI in Spanish?
- If root nonfinite forms exist in Spanish, can the UCC accommodate them?

6. Finiteness marking in Spanish-speaking children with specific language impairment

To our knowledge, there has only been one study of monolingual Spanish-speaking children with SLI in a predominantly Spanish-speaking society.[6] Bosch & Serra (1997) studied the spontaneous speech of 12 language-impaired children and

5. Since the stipulation that agreement in Southern Romance languages is D, as opposed to having D, was always a somewhat less than elegant theoretical maneuver, removing it would only make the theory more uniform and give it greater empirical coverage. In such a formulation, there would again be a conflict between the two constraints *Minimize Violations* and the *Unique Checking* and both root finite and root nonfinite verb forms could be derived.

6. This variable can be critical in evaluating monolingual Spanish morphosyntactic development in children with SLI (cf. Anderson & Márquez, this volume).

compared them to an age-matched control group of 12 typically-developing children. The mean age of the children studied (in both groups) was 7;6. They found no statistically significant differences between the groups with respect to substitution errors for person marking or for auxiliary omission errors. They did find a statistically significant difference between the two groups with respect to number marking, in that children used 3rd singular forms (possibly bare stems) in place of third plural forms. It is likely that the advanced age of the children in this study masked whatever underlying problem with verbal morphosyntax they may have had, as even English-speaking children with SLI, who have a much less regular set of finiteness markers to learn, perform at ceiling in finiteness marking tasks (Rice, Wexler and Hershberger 1998; Rice, Wexler and Redmond 1999).

There have also been few studies of finiteness marking in Spanish-speaking children in the US. Jacobson & Schwartz (2002) used an elicited production task to study verbs in third person singular and plural, past and present tense of 10 language-impaired Spanish-speaking children in the US (mean age = 4;7) who were compared to an age-matched control group of 10 typically-developing US Spanish-speaking children. Jacobson & Schwartz found no significant differences between the two groups' use of the 6 conjugations they compared, though the SLI children used a much smaller percentage of 3rd person plural present forms (2%) than did the typically developing control group children (10%). Interestingly, children produced both infinitives (e.g. *hablar* to speak) and progressive participles (e.g. *hablando* speaking) in their study, which would be consistent with the observation in Grinstead (1994) to the effect that an array of nonfinite forms are produced in child Catalan and Spanish. The progressive participles, however, could also be adult-like discourse-licensed answers to the wh- question which was used as a prompt in their task. For example, the question ¿Qué hace el señor con las salchichas? (What is the man doing with the sausages?), if it is interpreted as a progressive, which is possible in Spanish, may be answered in adult Spanish with a bare progressive participle, as in "Guardándolas." (Putting them away.). Similarly, if the interpretation of the present tense verb in the question is that of a habitual action (What does the man do with sausages?), then an infinitive is also discourse licensed in adult Spanish, as in "Comerlas." (Eat them.).

Because Jacobson & Schwartz's data only tested 3rd person forms, it was not possible to determine whether non-third person forms would default to the bare stem, which, as we have noted, is homophonous with the 3rd person singular form. In Bedore & Leonard (2001), however, we see that a default to the plausibly nonfinite bare stem from non-third person target forms is exactly what took place. Bedore & Leonard used an elicited production task to attempt to elicit 1st and 3rd person singular and plural, past and present verb forms from 15 language-impaired, Spanish-speaking children in the US, 15 Spanish-speaking children from

an age control group and 15 Spanish-speaking children from a language control group. Third person singular present errors were the most common error type in their results. The facts presented here move us closer to a profile of verbal tense errors made by child Spanish speakers, both with and without SLI.

7. The grammaticality choice task

If bare stem and infinitive verbs are a sensitive reflection of child Spanish speakers' grammatical knowledge of tense, then a more receptive task (recognizing that all tasks are both expressive and receptive to some degree) should also reflect this vulnerability in children's underlying grammatical representations.

7.1 Methods

7.1.1 *Participants*

The participants in this study included 27 monolingual Spanish-speaking children in Mexico City. 9 were diagnosed with specific language impairment. The children with SLI met all standard inclusive and exclusive criteria, including scores on a standardized language test (BELE "Batería de evaluación de la lengua española"- Rangel, Romero & Gómez 1988), normed on children in Mexico City, of -1.25 standard deviations below the mean (cf. Leonard 1997). The BELE includes 7 subtests. Our criterion was that children have a score of at most 6 (-1.25 SDs below the mean) on at least one comprehension test ("Comprensión Gramatical" Grammatical Comprehension or "Adivinanzas" Riddles) and at least one production test ("Producción Dirigida" Elicited Production or "Definiciones" Definitions). Further, children had to possess a nonverbal IQ of at least 85. This was measured using the WIPSSI (Weschler Preschool and Primary Scale of Intelligence), Spanish translation. With respect to hearing, the children were given thorough hearing tests and had to pass them at conventional levels. Further, parental report and medical history had to suggest no recent episodes of otitis media with effusion in order for a child to be included. Similarly, neurological tests determined that the children had no frank neurological damage. With respect to oral structure and oral motor function, initial examination ruled out structural anomalies and assured normal function. Parental report and family history interviews ruled out concerns pertaining to social and physical interactions.

In addition to the conventional inclusionary and exclusionary criteria, we also used the parental interview developed by Restrepo (1998) which has been validated as an instrument of identification of Spanish-speaking children with SLI. Children had to be identified as SLI by the interview in order to be included.

Finally, we applied a phonological screen, using 24 nonce words, the final segments of which were identical to those used in the grammaticality choice task in multimorphemic contexts /a, o, ó, os, é, ér, es, en/, in the same prosodic environments. In this screen, children had to pronounce nonce words such as "polé", "boros" and "suter", without omitting either of the two final segments on the words in order to be included in the study. This was a simple repetition task with no visual stimuli. In this way, we sought to exclude the possibility that children who made non-adult-like finiteness judgments on our task were doing so as a function of phonological problems. Children had to produce at least 4 out of 5 correctly from each category in order to be included in the study.

The group mean length of utterance, measured in words (or MLUw), for the SLI group was 3.0 (range = 2.1 – 3.89, SD = 0.72) and their mean age was 5;6 (67 months, range = 4;10 – 6;7, SD = 7.4 months). The language samples collected to make the MLU measurements were collected by native speakers of Mexican Spanish and 10% of every transcription was re-transcribed by another transcriber for reliability. Transcription agreement between the two transcribers was 95%. All disagreements were settled by a third transcriber.

The 18 children who formed the control groups were also given the standardized language test and their results were within 1 standard deviation of the mean for their ages, to eliminate either "super-normals" or language-impaired children. They were also given the phonological screen and passed to eliminate possible skewing of the results for phonological reasons. Our interactions with them as well as their parents and teachers reports suggested no abnormalities in their speech or language.

Of these 18 children, 9 formed an age control group with a mean age of 5;6 (67 months, range = 4;11 – 6;2, SD = 5.82 months). The remaining 9 children served as a language control or MLU control group, with a mean age of 5;0 (60 months, range = 3;11 – 5;11, SD = 10.04 months) with an average MLUw of 3.0 (range = 2.53 – 3.82, SD – 0.44).

7.1.2 *Procedures*

In previous work (Pratt & Grinstead 2007, 2008), we presented evidence that 15 typically-developing 5 year-old child Spanish speakers accepted possible nonfinite verb forms as grammatical in a grammaticality judgment experiment 27% of the time. In that study, we adapted the design of Rice, Wexler & Redmond (1999) for a grammaticality judgment experiment in which children were shown a scenario (in Flash animation in our experiment). In the scenario, one of the characters (a dog, a turtle or a cat) would comment on their actions using either a finite or a nonfinite utterance. The child was then asked to judge whether the character had produced a grammatical or an ungrammatical utterance ("Lo dijo bien o lo dijo mal?" Did he say it right or did he say it wrong?).

In light of the contentions of some investigators to the effect that children with SLI may have reduced language processing abilities (e.g. Katz, Curtiss & Tallal 1992), we modified our existing protocol in an attempt to reduce the processing demands for the children. Our modification of the grammaticality judgment task follows Chierchia, Crain, Guasti & Thornton (1998) – researchers studying the development of semantic-pragmatic knowledge, who have experimented with revised versions of Crain and McKee's (1985) Truth Value Judgment Task (TVJT) – so as to reduce the processing demands placed on children by the experiment. Their conceptual motivation for modifying the Truth Value Judgment Task comes from Reinhart (1998, 2004) who argues that children's performance on tasks where they are forced to compute a comparison set of some kind will not reflect their grammatical competence, but rather their immature language processing abilities. The modification introduced by these researchers into the TVJT is to present the child with two plausible alternatives and ask the child to choose between them, instead of asking the child to render a judgment on the correctness of a proposition with no explicit comparison set. In this way, the plausible option is presented to children and they do not have the added processing burden of generating their grammar's version of a comparison sentence.

Our attempt to reduce the processing burden on the children, then, consisted of modifying our grammaticality judgment task, so that children heard both the grammatical sentence and the ungrammatical sentence (putatively grammatical in children's optional infinitive grammars) each time, one by each of two puppets. The two puppets varied as to which produced the ungrammatical sentence and as to which spoke first. Children were shown pictures of the puppets (a cat, a dog and a turtle) performing or observing the action depicted in the sentence. Then one of the puppets would utter the ungrammatical sentence, e.g. "Nosotros abrir la boca." ('We to open our mouths.') and the other would utter the grammatical sentence, e.g. "Nosotros abrimos la boca." ('We are opening our mouths.') as they looked at a picture in which they were both opening their mouths. Children were then prompted to choose which character had said it correctly ("¿Lo dijo bien el gato o lo dijo bien la tortuga?" – 'Did the cat say it right or did the turtle say it right?').

There were 11 pairs of sentences in the past and 11 pairs of sentences in the present. 1 sentence pair was misunderstood by all children and was removed. There were 10 filler items, 5 in the present and 5 in the past. Children had to pass at least 7 fillers to be included. Two language-impaired children did not pass the fillers and were removed. All of the control children passed the fillers. Fillers consisted of sentences which were subtly, but clearly ungrammatical. By this, we mean that children were presented with sentences which had the order of the noun and determiner reversed, as in (27) and (28), in addition to having a nonfinite verb,

compared to a grammatical version of the same sentence, following the format of the rest of the task.

(27) Ustedes jugar futbol en parque el.
you-pl play-inf soccer in park the
"You to play soccer in park the."

(28) El perro escribir carta una.
the dog write-inf letter a
"The dog to write letter a."

The ungrammatical sentences in the filler pairs were clearly ungrammatical in Spanish, and not just with respect to finiteness but also with respect to noun-article order. They were not, however, as ungrammatical as, for example, a complete jumbling or "word salad" of the words of a sentence, as in (29).

(29) En jugar parque ustedes futbol el.
in play-inf park you-pl soccer the
"In to play park you soccer the."

This difference is important because we found in piloting these grammaticality judgment tasks that children become "tuned" to the degree of ungrammaticality that is being tested.[7]

All of the verbs were taken from the Spanish version of the MacArthur Communicative Development Inventory (Jackson-Maldonado, Bates & Thal 1992) to increase the odds that the words would be in the children's vocabulary. Items were counterbalanced for verb conjugation (*-ar*, *-er*, *-ir*), transitivity and order of presentation.

8. Results

As we can see in Table 4, the children with SLI had lower percentages correct than did the typically-developing children in the control groups.

7. When piloting a version of the experiment with "word salad" type ungrammatical fillers (e.g. I saw him across the room. – Room him across saw I the.), we found that when we asked children if a root nonfinite sentence was ungrammatical, some would actually say, "Pues, no está tan mal…" or "Well, it's not that bad…".

Table 4. Percentage Correct Choice of SLI Children and 2 Control Groups

	Past	Present	Average	SD
SLI	44.44%	50.51%	47.47%	13.85%
MLU	81.82%	69.70%	75.76%	15.08%
Age	80.81%	81.82%	81.31%	8.33%

When the average results of past and present were compared using a one-way ANOVA, across the 3 groups (SLI, MLU and Age), with group as the between subjects variable, a main effect was found (F [2, 24] = 18.204, p <.0001). Further, post-hoc (LSD) testing found that the scores of the SLI children were significantly worse than those of the Age control group (p <.0001) and that they were also significantly worse than those of the Language (MLU) control group (p <.0001), as illustrated in Figure 2.

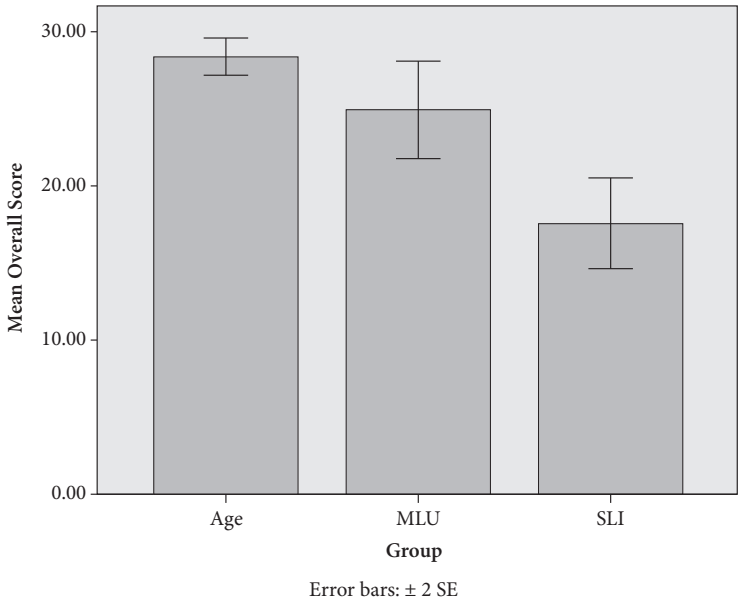

Figure 2. Mean Percentage Correct for Three Groups on the Grammaticality Choice Task for Finiteness Marking

Table 5. Average Number Correct and Percent Correct for Bare Stems and Infinitives By Group

	Bare Stems	Infinitives
SLI	4.33/10 (43%)	5.56/12 (46%)
MLU	7.44/10 (74%)	9.22/12 (77%)
Age	8.11/10 (81%)	9.78/12 (81%)

Further analysis, illustrated in Table 5 and Figure 3, revealed a main effect of verb form type, with group as the between subjects variable, for infinitives (F [2, 24] = 11.680, p < 0.0001), and bare stems (F [2, 24] = 18.642, p < 0.0001).

Post-hoc LSD testing showed that the SLI children were significantly worse than both MLU controls (p =.001) and age controls (p <.0001) with infinitives and worse than MLU controls (p <.0001) and age controls (p <.0001) with bare stems.

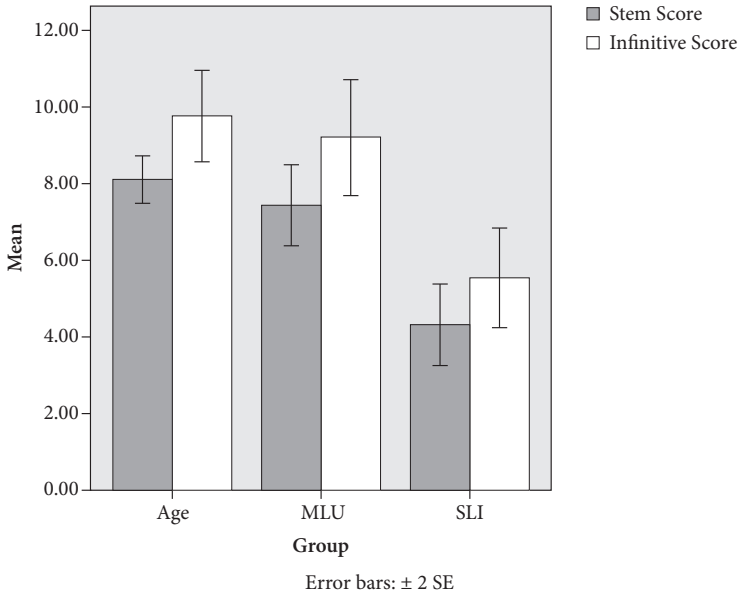

Figure 3. Comparison of Mean Percentage Correct for the Three Groups for Bare Stem and Infinitive Verbs

9. Discussion

In this study, we have seen a confirmation of the existence of multiple nonfinite forms in the grammars of both typical and atypical child Spanish speakers. We find them in spontaneous and elicited production data and children affirm their grammaticality in our receptive task. As regards our first research question with respect to whether methodological techniques other than spontaneous production could overcome the limitations of a null subject language with portmanteau tense-agreement morphology, the answer appears to be yes.

Regarding our second question of whether finiteness marking could distinguish language-impaired children from age- and MLU-matched control groups, the answer again appears to be yes. In our Grammaticality Choice task, both the average score on bare stems and infinitives as well as each form individually were capable of distinguishing children with SLI from the two control groups.

Our final research question is whether the UCC framework of Wexler (1998) and the Extended Optional Infinitive (EOI) account can be squared with our results. As stated above, it would seem a relatively simple matter to remove the stipulation agreement in Spanish is D, as opposed to has D. That should make the system work.

However, we would rather propose an account that does not emerge in an ad hoc fashion from the specifics of solving the root infinitive problem, but rather one which is motivated by other phenomena of cognitive and linguistic development. Since at least Piaget (1952), it has been observed that child language has an "egocentric" flavor to it, which in recent formulations has been attributed to children's general inability to take their interlocutors' perspective into account, known as Theory of Mind (Perner and Wimmer 1985). Many linguistic studies of constructions which are sensitive to interlocutor perspective have attributed children's non-adult-like behavior to delayed development, relative to language, of this ability to take into account the perspective of others. The studies seem to categorize two fundamental classes of linguistic pragmatic deficits. First, there are studies which show that children behave as if their interlocutors shared their perspective, when in fact they do not. In these studies, children are, for example, shown to overuse definite articles with nouns when they have no reason to assume that their interlocutors are familiar with the referents of the definite-marked nouns, as in Maratsos (1974). Similarly, Grinstead (2004) argues that child Catalan and Spanish speakers appear to overuse null subjects, suggesting again that they think their listeners are able to determine from context what the antecedent of these phonetically null pronouns are. The other category of pragmatic deficit errors are errors in which children fail to use constructions which are mandatory in adult language. Schaeffer (2000) shows that child Italian speakers many times fail to use clitic pronouns in discourse contexts in which adults would use them. Instead, they many times use full noun phrases, in spite of the fact that the antecedent is well-established in discourse. In the same set of studies, Schaeffer (2000) shows that Dutch-speaking children fail to scramble definite DPs to higher positions in the clause, as would adult speakers.

We would like to suggest that children's failure to use the tense marking which is obligatory in the adult language is a failure to recruit pragmatic knowledge of the latter type. As we have seen, the nonfinite verbs that children use in Spanish are not gibberish, but rather are adult forms which share a crucial feature: they are used without their tense being independently specified. In the case of morphological infinitives, the auxiliary verb which performs this function is missing. In the case of impersonal verbs, which are presumably interpreted as distinct from bare stems as a function of deictically established tense, the context-sensitive deictically-established tense is missing.

We propose that children fail to use discourse-pragmatic knowledge of the relationship between speech time, event time and reference time (in the sense of Reichenbach 1947) to mark verbs morphologically so as to represent the speaker's perspective on the event with respect to the temporal framework of the discourse.

As in Grinstead (2004), we assume, contra Avrutin (1994), Schaeffer (2000) and Thornton & Wexler (1999); that there is nothing actually immature, limited or otherwise underdeveloped about children's discourse-pragmatics competence itself, given the nonlinguistic evidence that children are able to distinguish new information from old (e.g. Baker & Greenfield 1988) and are able, by 15 months, to pass non-verbal tests of the belief tracking component of Theory of Mind (Onishi & Baillargeon 2005). These abilities suggest that children do not lack the cognitive underpinnings of these aspects of pragmatic knowledge. Consequently, the only alternative would seem to be that there is something mediating between grammatical and pragmatic knowledge, which has not yet developed. We refer to this as "Interface Delay" and to the case of root nonfinite forms being produced as a result as "Temporal Interface Delay".

This hypothesis predicts that those aspects of grammar that are discourse-sensitive should be slower to develop in typically-developing children and more vulnerable in children with SLI, which seems roughly to be true for SLI in Spanish. While marking nouns as plural (Grinstead, Cantú & Flores 2008) and noun-adjective agreement (Cantú & Grinstead 2004) are not discourse-sensitive and not problematic for children with SLI, the same children have problems with clitics (De la Mora, Paradis, Grinstead, Flores & Cantú 2003), articles (De la Mora 2004) and verb tense, all of which are discourse-sensitive. Our hope is that future research into the differences among discourse-sensitive and discourse-insensitive

constructions in child Spanish will lend insight into the nature of language development and possibly aid in the early diagnosis of SLI in child Spanish speakers.

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