

Receptive Measures of the Optional Infinitive Stage in Child Spanish

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1. Introduction

The root infinitive phenomenon, referred to by Wexler (1990, 1994, 1998, 2000) as the "Optional Infinitive Stage", has a number of important properties, the most fundamental being the simultaneous use of both finite and nonfinite verbs in root clauses. For example, young child English-speakers produce both "He walk." and "He walks." in the same recording session. To account for this phenomenon, Wexler has proposed a series of grammatical accounts which attempt to explain the apparent optionality of tense marking by postulating a variety of child-specific syntactic theories. Further research into the nature of nonfinite utterances in root clauses in child language extended the empirical domain investigated to children with language disorders. This research program, developed in Rice & Wexler (1996), Rice, Wexler & Cleave (1995), Rice, Wexler & Hershberger (1998) and Rice, Wexler and Redmond (1999), demonstrated that a further property of the root infinitive phenomenon is that it persists for lengthy period, in children with specific language impairment (SLI) and also in a subgroup of children with autism spectrum disorder (ASD), as in Roberts, Rice & Tager-Flusberg (2002). The existence of an optional infinitive stage in the development of null subject languages, such as Spanish, however, has been largely misunderstood.

In previous work (Pratt & Grinstead 2007a), we reviewed evidence from studies of child Spanish which employed a wide array of methodological approaches including spontaneous production, elicited production with nonce verbs and elicited production with real verbs which demonstrates that child Spanish grammars do indeed allow optional infinitive verbs. In addition, we presented the results of a grammaticality judgment task with 15 typically-developing Spanish-speaking children showing that they accepted as grammatical a set of non-finite forms in child Spanish. In this way, we added to the growing body of evidence, including Kernan & Blount (1966), Hernández-Pina (1984), Pérez-Pereira (1989), Radford & Ploennig-Pacheco (1995), Davidiak & Grinstead (2004), Clahsen, Avelado & Roca (2002), Licerias, Bel & Perales (2006) and Buesa (2006), that child Spanish is indeed an optional infinitive grammar.

If child Spanish is an optional infinitive grammar, as we argue, one would expect child Spanish speakers with SLI to pass through an extended period of optional infinitive use, as in child English. To investigate this issue, we reanalyze the results of a previous elicited production study of verbal tense and agreement marking in typically-developing and language-impaired Spanish-speaking children (Bedore & Leonard 2001) and conclude that nonfinite verbs in the grammars of Spanish-speaking children with specific language impairment are persistent, as in English, and that they distinguish language-impaired children from both age-matched and language-matched control groups of typically-developing children. Then we present the preliminary results of an on-going study, which includes a new grammaticality judgment task which was carried out with monolingual Spanish-speaking children in Mexico ($n = 40$) between 4 and 6 years of age, both typically-developing and language-impaired, and show that the language-impaired children, when tested receptively on their ability to distinguish the set of nonfinite forms produced by children in Spanish from finite verbs, perform significantly worse than unaffected children of their age and worse than unaffected children a year and a half younger than they are.

2. Background

Rice & Wexler (1996) showed that language-impaired child English speakers fail to mark tense on verbs to the degree that their production distinguishes them from typically-developing children of the same age (age controls) and also from typically-developing children of the same level of linguistic development (language controls), calculated in mean length of utterance (mlu). Further work has

shown that children with SLI are not only significantly less proficient than language and age controls in production of tense marking (Rice, Wexler and Hershberger 1998), but also in their receptive abilities to distinguish finite from nonfinite verbs, as measured by their performance on grammaticality judgment tasks (Rice, Wexler and Redmond 1999). How does Spanish fit in to this picture? If there is no optional infinitive stage in child Spanish, then we would not expect receptive or expressive measures of verb finiteness to distinguish child Spanish speakers with SLI from typically-developing controls of the same age or of a younger age. On our hypothesis, that Spanish does have an optional infinitive stage, we expect that such measures of finiteness marking should distinguish them.

Earlier research into the question of whether Southern Romance languages displayed optional infinitive characteristics mistakenly concluded that it did not, which was largely the result of the methodological means that were used to study the question. In particular, the null subject nature of these languages means that in studies of spontaneous production, only about 20% of utterances with verbs (Bel 2003) also contain an overt subject such that it can be determined whether a verb agrees with its subject or whether, if the verb occurs in third person singular present (e.g. *Corre.* or "Run."), it is a nonfinite bare stem¹. Because virtually all of this research was carried out with spontaneous production data, the presence of large numbers of bare stem verbs made it difficult to know the percentages of these forms that were finite 3rd person singular present tense vs. nonfinite bare stems (verb root + theme vowel). The facts presented in Davidson & Goldrick (2003), showing that third person singular forms disappear from the spontaneous production data of child Catalan speakers at the same rate that non-third person forms are added, strongly suggests that many of these bare stem forms are in fact nonfinite. An additional limitation of studying the development of tense and agreement marking in Spanish using only spontaneous production is the possibility that many of the verbs children use may be memorized forms, lacking internal morphological complexity, presumably drawn from the lexicon as monomorphemic units.² Some studies took care to use productivity criteria to eliminate these cases, but most did not. For these reasons, elicited production studies which 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 may serve as a clearer reflection of the grammatical competence of children with respect to finiteness marking.

Bedore & Leonard (2001) carry out an elicited production study with 3 and 5 year-old typically-developing and language-impaired Spanish-speaking children in the US in which they elicit 1st and 3rd person, singular and plural, present and past tense verbs. The approach taken by Bedore & Leonard (2001) to analyzing their results is ask for each of the target forms (e.g. 3rd person, plural, present indicative tense) whether language-impaired children's scores are significantly worse than for the control groups. They conclude for most of them that they are not. As we will see directly, while they are correct that overall proficiency with all verb forms seems high, the distribution of errors in each of the groups they studied was different and, we argue, quite revealing regarding the nature of Spanish syntactic development in both language-impaired and typically-developing children.

3. Study 1 – Revisiting Bedore & Leonard (2001)

3.1 Bedore & Leonard's Results

Bedore & Leonard's (2001) important study, unlike previous elicited production studies, provided information as to the kinds of errors children made when attempting to produce adult target forms. The overall error rates for language-impaired children, same-age controls and same-linguistic level controls are given in Table 1.

	SLI	3 Year-olds	5 Year-olds
Total Errors	211	176	56
Total Possible	1296	1186	1511
Percent Errors	16%	15%	4%

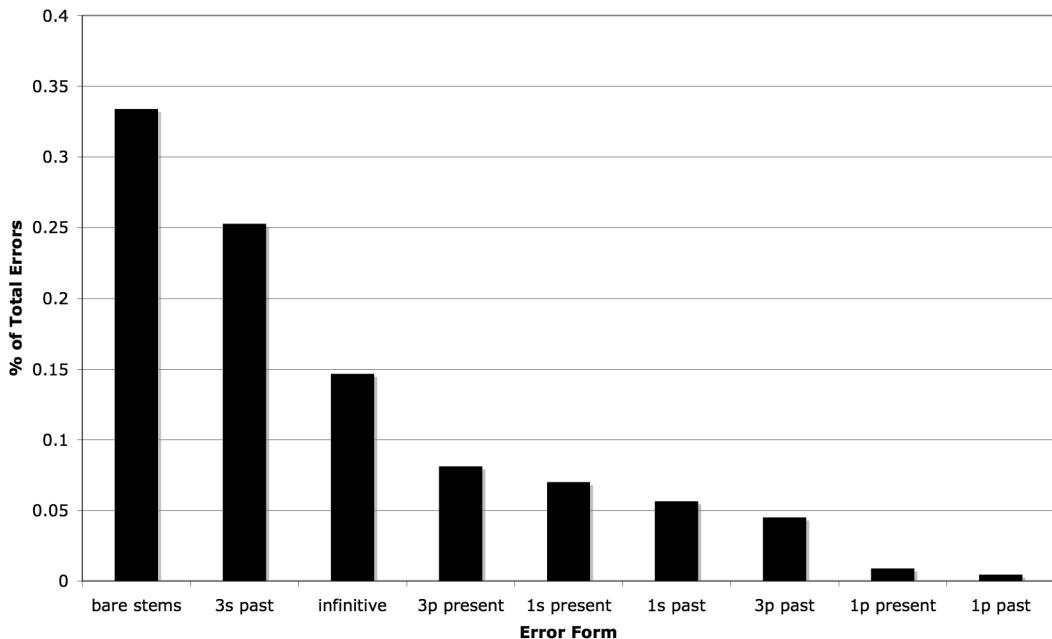
Table 1 – Elicited Production Errors from Bedore & Leonard (2001, Table 5, pre-publication copy)

¹ See Pratt & Grinstead (2007a) for arguments internal to adult Spanish syntax that bare stems are, prima facie, good candidates for nonfinite forms in child Spanish.

² Though they may have the appropriate syntactic features associated with them, on analogy with phrasal or constructional idioms, as in Jackendoff (1997, 2002).

On the basis of the results in Table 1, it is possible to conclude that language-impaired children mark finiteness more similarly to their 3 year-old language controls than to their age controls, but that overall they appear very similar in their overall percentages of errors to both control groups. But, what about the distribution of these errors? Are the kinds of errors made by the SLI children similar to the errors made by the control group children? The errors all groups of children produced were mainly of three forms: bare stems, morphological infinitives and overgeneralized 3rd person past (preterite forms), illustrated in Figure 1 which aggregates the errors made by all three groups.

Figure 1 - Error Distribution by Form For SLI, Age and MLU Groups Together



The first two types of errors are relatively easy to find in spontaneous production data, as in the following examples from Grinstead (1998).

Bare Stems

- (1) Carlos - 3;3.28
Yo pone.
I-nom put 3rd sg
"I puts."
- (2) Eduardo - 2;2.0
Es tú.
Copula 3rd sg you-nom
"Is you."
- (3) Graciela - 2;6.5
Hace esto yo.
do 3rd sg this I-nom
"I does this."

Morphological Infinitives

- (4) Carlos - 2;2.7
Payaso venir.
clown come inf
"Clown come."
- (5) Graciela - 2;3.11
Bañar.
bathe inf
"Bathe."
- (6) Eduardo - 2;8.26
Pintar.
paint inf
"Paint."

The last type of error is somewhat rarer in spontaneous production, though possible to find, nonetheless (examples also from Grinstead 1998). With this last type of error, the attempt, in the

spontaneous production sessions – to the degree one can tell, appears to be to produce a first person singular past (preterite) form, which instead is produced as a third person singular past (preterite) form.

Overgeneralized Third Person Past (Preterite)

(7) Graciela - 2;2.23

Yo se cayó.

I-nom cl. 3rd sg fall 3rd sg past

"I fell."

(8) Graciela - 2;7.6

Yo lo rompó.

I-nom cl acc sg masc break past overreg

"I broke (vis. rompí) it."

These three error types were the most frequent in the elicited production data reported by Bedore & Leonard (2001), however, in Table 2, we see that the errors of each type were distributed quite differently among the three groups of children. In Table 2 each type of error is shown as a percentage of all errors for each group.

	Bare Stem	Infinitive	3rd Past	Total
SLI	73 (35%)	36 (17%)	64 (30%)	211
3 Year-olds	63 (36%)	16 (9%)	38 (22%)	176
5 Year-olds	12 (21%)	13 (23%)	10 (18%)	56

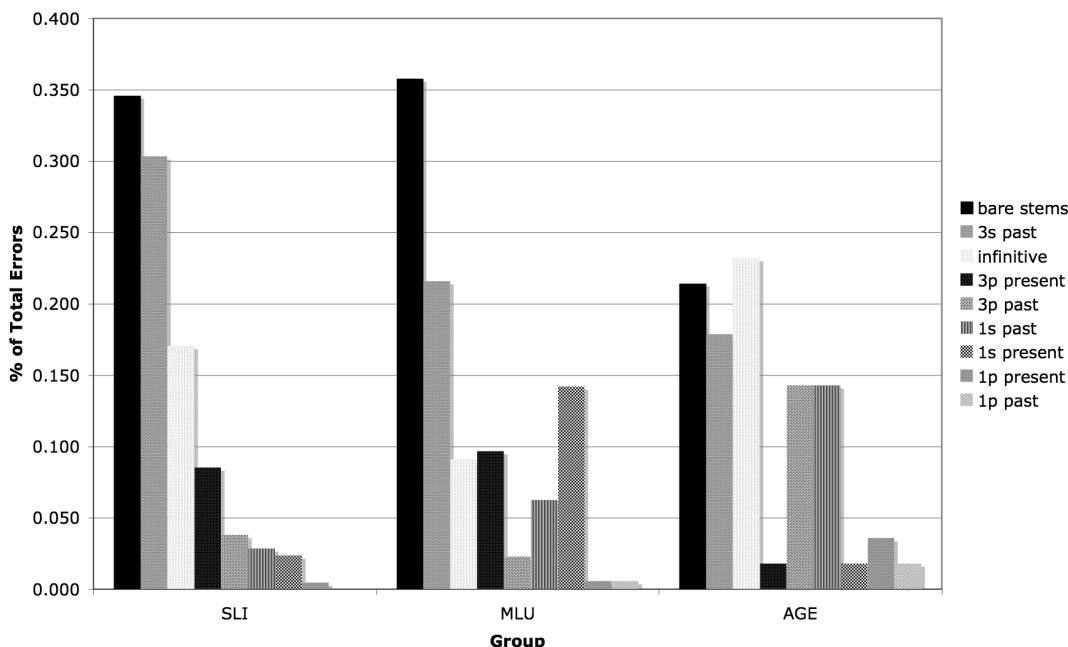
Table 2 – Error Type Distribution by Group, with Percentage of Total Errors (compiled from Bedore & Leonard 2001, Table 5)

How were the errors distributed in each group? The overgeneralized 3rd person past error was the most commonly committed error by the SLI children. Of 149 attempts to produce a first person singular past form, the SLI group produced 19 third person singular past forms (13%). Their MLU controls produced only 6 errors of this type, out of 132 opportunities (5%). Age controls produced only 1 error of this type out of 167 opportunities. While the SLI group made the most (highest percentage of) 3rd past errors, the 5 year-olds (age controls) produced a slightly higher percentage of infinitives than the SLI group and the 3 year-olds (language controls) produced a slightly higher percentage of bare stem errors than the SLI group. This is illustrated in Table 2 and also in Figure 2. Thus, we see how the SLI children's errors were distributed differently than the control group children, in spite of the fact that the overall error percentages across the three groups were not terribly different.

The facts presented here move us closer to a profile of verbal tense errors made by child Spanish speakers, both with and without SLI. Note that in Figure 2 the children made a range of errors, but that the three we have exemplified above are the most common forms for the children to produce as an error, regardless of the adult target form. In Rice & Wexler (1996), a composite of target forms, all of which are taken to be markers of tense (auxiliary and copular *be*, *have*, *do*, 3rd singular *-s* and past tense *-ed*), are shown to be useful in identifying children with SLI with a high degree of sensitivity and specificity. In analyzing the Spanish data, however, there is a much wider range of possible target forms, in the sense that for the present tense of the verb *walk* in English, there are only two possible forms, regardless of subject: *walk* and *walks*, while in Spanish there are at least 5 distinct agreement markers in the present indicative tense, in the Mexican dialect studied. Consequently, we take the erroneous forms produced, and not their intended target, to be the most efficient and sensitive candidates for our Spanish Tense Composite for identifying children with SLI.

(9) Spanish Tense Composite – the errors produced in typical and language-impaired grammars which best represent a failure to mark tense are bare stems, morphological infinitives and 3rd singular past tense forms.

Figure 2 - Error Types by Group



3.2 Our Reanalyzed Results of Bedore & Leonard

If Rice & Wexler are correct that tense is selectively impaired in the grammars of SLI children, and if our Spanish Tense Composite embodies the most important nonfinite forms of child Spanish, then Spanish-speaking children with SLI should produce them significantly more frequently than typically-developing child Spanish speakers of the same age and linguistic level. To test this prediction, we calculated the percentage of all errors that were errors due to the Spanish Tense Composite in Bedore & Leonard's results. We then performed a Dunnett comparison of least significant differences between SLI and Age matches and found significant differences, at the 95% confidence interval, which does not include zero (0.024, 0.365). The same test also found significant differences between SLI and MLU matches, at the 95% confidence interval, which does not include zero (0.052, 0.258), illustrated in Table 3.

	Composite/Total Errors (%)	Difference	95% Lower Bound	95% Upper Bound
SLI	173/211 (82%)	--	--	--
Age Controls	35/56 (63%)	0.19	0.024	0.365
MLU Controls	117/176 (66%)	0.16	0.052	0.258

Table 3 - The proportion of all error that were Spanish Tense Composite finiteness errors (bare stems, infinitives & 3rd singular past) compared between SLI & MLU controls and SLI & Age controls (compiled from Bedore & Leonard 2001)

In sum, what we have found is that the proportions of the errors produced by the children in Bedore & Leonard's (2001) elicited production data which were due to the three forms of the Spanish Tense Composite were larger, to a statistically significant degree, between the children with SLI and their age-matched control group and were also larger to a statistically significant degree between the children with SLI and their MLU-matched control group. We take this to be strong confirmation of the hypothesis that the nonfinite forms of the Spanish Tense Composite are important nonfinite forms in child Spanish, that child Spanish is an optional infinitive grammar and that tense marking may serve as

a clinical marker of SLI in child Spanish speakers as it does for child English speakers. This suggests that language-impaired child Spanish speakers may be considered to be in an Extended Optional Infinitive Stage, in the sense of Rice & Wexler (1996).

4. Study 2 – Grammaticality Judgment of Nonfinite Verbs in Child Spanish

Because the raw percentage of nonfinite verb errors in production studies is not large in any of the groups of Spanish speaking children, it might not be clinically useful as a pathognomonic marker. Given this fact, it might be more feasible to attempt to detect the disorder receptively, which leads us to the question of whether monolingual Spanish-speaking children are capable of receptively distinguishing nonfinite verbs from finite verbs. To answer this question, we developed a new grammaticality judgment task, a revision of the task in Pratt & Grinstead (2007a).

4.1 Participants

The participants in our study were 40 monolingual Spanish-speaking children in Mexico City. 29 of these children were typically-developing, between the ages of 4;0 and 6;8 (mean = 5;5). Eleven of the children were language-impaired, between the ages of 4;10 and 6;7 (mean = 5;6). All children were given the Bateria de Evaluación de Lengua Española or BELE (Rangel, Romero & Gómez-Palacios 1988) and 3 of the non-impaired children who had scores less than -1.25 standard deviations below the mean for their age were excluded. None of the non-impaired children were "super-normals" or outside of the standard range for age group. Additionally, all children were given and passed a phonological screen which consisted of repetition of nonce words which included the target segments studied /es, as, an, en, o, ó, a, e, é, mos/.

All linguistic tests were performed by native speakers of Mexican Spanish and all diagnostic tests were performed by experienced audiologists, psychologists, speech-language pathologists and neuropsychologists at the Instituto Nacional de Rehabilitación in Mexico City.

The SLI children met conventional inclusionary and exclusionary criteria. They had normal hearing and no recent episodes of otitis media. They had normal physical and social interaction, with no frank neurological damage, no oral motor problems, no oral structure problems, and all had nonverbal IQs over 85, as measured by the WIPPSI (Weschler Preschool and Primary Scale of Intelligence), Spanish version. All children classified as language-impaired had scores on our standardized language test (BELE) of at least -1.25 standard deviations below the mean. The BELE has 7 subtests, four of which we applied (*comprensión* – grammatical comprehension, *producción dirigida* – elicited production, *adivanzas* – riddles and *definiciones* - definitions). In order to be included in our language-impaired category, children had to receive scores -1.25 standard deviations below the mean on at least 1 of the two production tests (*producción dirigida*, *definiciones*) and on at least 1 of the two comprehension tests (*comprensión*, *adivanzas*). To be included, children also had to pass the abovementioned phonological screen. Finally, because it has been independently validated as a highly sensitive and specific instrument for the identification of Spanish-speaking children with SLI, we also applied the parental questionnaire of Restrepo (1998). Only children classified by the questionnaire as SLI were included.

4.2 Methods

In previous work (Pratt & Grinstead 2007a), we showed that 15 typically-developing 5 year-old child Spanish speakers accepted the three nonfinite verb forms of our Spanish Tense Composite 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?*).

In light of the contentions of some investigators to the effect that children with SLI may have reduced language processing abilities (e.g. Tallal et al 1996), we decided to modify our existing

protocol so as to reduce the task 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 memory demands placed on children by the experiment. Their 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 thinking of what a plausible alternative option would be.

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 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 17 pairs of sentences in the past and 17 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. What we mean by this is that children were presented with sentences which had the order of the noun and determiner reversed, as in (10) and (11), 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.

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

(12) 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 (13).

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

The 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.³

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

³ 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...".

would be in the children's vocabulary. Items were counterbalanced for verb conjugation (*-ar, -er, -ir*), transitivity and order of presentation.

4.3 Results

Data from this study is still being collected, however, our preliminary results, given in Table 4 show that the performance of the 5 year-old typically-developing children improved substantially from our previous experiment inasmuch as (slightly younger) 5 year-olds in the previous experiment were only able to reject nonfinite utterances 73% of the time, but were able to reject them 87% of the time in the current experiment.

	Present	Past	Total
SLI (n=11)	93/187 (50%)	91/176 (52%)	184/363 (51%)
4 Year-olds (n=5)	68/85 (80%)	61/77 (80%)	129/162 (80%)
5 Year-olds (n=10)	147/170 (86%)	138/160 (86%)	285/330 (87%)
6 Year-olds (n=11)	166/187 (89%)	146/176 (83%)	312/363 (86%)

Table 4 – Percentage Correct Chosing Between Root Finite and Root Nonfinite Verbs

Perhaps most dramatically, the language-impaired children (mean age = 5;6) in this study were only able to reject nonfinite verbs 49% of the time. It does not appear that the task itself was problematic for the language-impaired children, however, because those included were able to detect ungrammaticality in the filler sentences at least 70% of the time. Thus, it does not appear that the format of the task itself was particularly difficult for children, given that they were able to successfully detect ungrammatical noun-determiner order in the fillers.

The individual performance of the 13 language-impaired children on the filler items is given in Table 5. There we see that the children 12 and 13 had chance scores on the fillers and were excluded because they did appear to be guessing. Children 1-11, however, seemed to be able to detect the ungrammaticality of noun-determiner order, but, as we see from the results in Table 4, were completely unable to distinguish between a root nonfinite utterance and a root finite utterance.⁴

Child ID#	Number Correct out of 10 Fillers
01	10
02	10
03	10
04	10
05	9
06	9
07	8
08	8
09	8
10	7
11	7
12	5
13	4

Table 5 – Performance of Language-impaired Children on Filler Pairs

⁴ It is worth noting that if we were to remove the two children remaining in our group of 11 with the poorest scores on the fillers (7 out of 10), the overall performance of the language-impaired group would remain essentially unchanged ($154/297 = 52\%$).

5. Discussion

Summarizing, there is now substantial evidence from numerous studies, employing a wide variety of experimental methods that child Spanish is an optional infinitive grammar. The three nonfinite forms of the Spanish Tense Composite are allowed by child Spanish grammar in spontaneous production, elicited production and grammaticality judgment studies. Most importantly for the current study, we have shown that monolingual child Spanish speakers who have been independently diagnosed with specific language impairment, using the conventional criteria, appear to be acutely insensitive, by our receptive measure, to grammatical markers of tense. This finding runs counter to the findings in spontaneous production studies of typically-developing child speakers of Southern Romance, mentioned earlier, but it also runs counter to spontaneous production studies of language-impaired child speakers of Southern Romance (e.g. Bedore & Leonard 2005), with some exceptions (e.g. Bortolini, Caselli & Leonard 1997). As stated above, we believe that most of the conflict between our findings and those in the field which have concluded that child speakers of Southern Romance are essentially error-free with respect to finiteness marking stems from the methodological problem inherent in using spontaneous production data in a null subject language to reach conclusions that crucially turn on accurately measuring subject-verb agreement. Since there are few, if any, overt subjects present with verbs, it is difficult to know on the basis of such data whether bare stem (apparently 3rd singular present or 3rd singular past) forms are finite or nonfinite. What we have seen in this experiment, is that children judge such forms to be acceptable to their grammars, and we argue that when such forms are produced, they are likely to be associated with a nonfinite interpretation. We have also shown that the data provided by the elicited production study in Bedore & Leonard (2001), when interpreted in the way we have proposed, distinguishes child Spanish speakers with SLI from their control groups, as a function of verbal tense marking.

What are the implications of these findings for current theoretical work in typically-developing child language? Returning to Wexler's (1998) Unique Checking Constraint (UCC) framework, we feel that our data can easily be accommodated in its current format. The UCC assumes, following Chomsky (1995), that verbs raise to check or eliminate their D features against the D feature of tense and/or the D feature of agreement, however, in order to capture the mistaken generalization of child Southern Romance languages as not being optional infinitive grammars, Wexler further assumes that the pronominal nature of agreement in these null subject languages means that they have no D feature in agreement since agreement itself is D. We suggest that a much more natural interpretation of the pronominal nature of agreement in Southern Romance is that it is D and that consequently it does have a D feature. Little else beyond removing this assumption need be done in order to make the UCC account consonant with the fact that child Southern Romance languages are optional infinitive grammars.

What are the implications of this account for explanations of the SLI deficit? On a representational account of SLI, along the lines of Rice & Wexler (1996), the facts presented could be viewed as supporting an "extended optional infinitive" explanation of the deficit, given that we have found the same kind of deficit in verbal tense marking that has been shown for English. One of the strongest arguments in favor of Rice & Wexler's (1996) representational view of SLI, however, is the fact that the /s/ morpheme is impaired when it marks 3rd singular present tense verbs in both comprehension and production for child English-speakers with SLI while the very same segment in highly comparable prosodic environments is produced unproblematically when it marks plural on nouns⁵. This is striking evidence that there is nothing less salient or difficult to process about this morpheme with respect to its phonological properties, as input processing theories (e.g. Tallal et al 1996) or phonological salience theories (Leonard, Eyer, Bedore & Grela 1997) would suggest. Rather, it gives the appearance that difficulty lies in the fact that in one case it represents verbal tense while in the other it represents nominal number.

Is there evidence like this for Spanish? To answer the question most convincingly, we would need to pair elicited production and comprehension studies, as Rice & Wexler have done, which has yet to

⁵ Though see Oetting & Rice (1993), Rice & Oetting (1993) and Oetting (1993) for evidence that plural allomorphs with epenthetic vowels of the "box" – "boxes" type are quite problematic for English-speaking children with SLI. See Grinstead, Cantú & Flores (in press) for similar findings for the epenthetic allomorph "ratón" – "ratones" in Spanish-speaking children with SLI.

be done for child Spanish SLI. Nonetheless, existing data, including the data just reported, may offer a partial answer. In an elicited production study of plural marking on nouns in language-impaired Spanish-speakers (Grinstead, Cantú & Flores under submission), it was shown that canonical plurals in Spanish of the "mesa" – "mesas" variety seem unproblematic. Overall, the affected children produced this type of noun plural correctly 183 out of 200 (92%) opportunities. Here we refer to the /s/ allomorph added to an /a/ or /o/ word-final, unstressed theme vowel. As part of our current grammaticality judgment study of verbs, children had to choose the correct form between two candidates, one of which was the second person singular present indicative "tú" form, which also ends in /s/, preceded by an unstressed /a/ or /e/ vowel. However they did so correctly on only 29 out of 44 (66%) opportunities. Though scores from the two kinds of studies are not completely comparable, the data are nonetheless suggestive. It must also be pointed out that the SLI children in the noun study were younger ($n=10$, mean age=4;10) than the children in the verb study ($n=11$, mean age=5;6). Consequently we might expect the numbers to diverge even more than they appear to, were the children of the same age, making the case even more strongly that a very similar morpheme in a prosodically very similar position appears to be impaired when it marks tense, but spared when it marks number. Again, such a difference, to the degree that the comparison is valid, argues for the representational position and against information processing and/or phonological salience explanations.

But, is the UCC framework the best explanation of the root infinitive phenomenon and is the Extended Optional Infinitive hypothesis the best explanation of impaired tense marking in children with SLI? While the contrast between nominal plural marking and verbal tense marking, using the same phonological segment (/s/), makes the case nicely that we are not looking at a phonological salience or a processing phenomenon, and while it would certainly seem to suggest that the root of the problem has to do with grammar, it might not necessarily be the case that the problem is rooted in the syntactic machinery of verb raising itself and it might not necessarily be the case that there is a constraint (the UCC) which exists only in child language and appears to only have one purpose, namely, explaining the root infinitive phenomenon. The noun plural vs. verb tense distinction can also be characterized in another way, which is that while noun plural marking is a purely clause-internal property, as it has been tested at least⁶, tense marking on verbs can be seen as depending very much more on the interface between clausal syntax and discourse pragmatics. Tense marking is discourse-sensitive in the sense that in order for discourse to be coherent, speakers must take into account the relationship between speech time and event time not only from their own perspective but also from the perspectives of their interlocutors. It is in this sense that one of the principle functions of tense marking is to make one's presuppositions regarding the relationship between speech time and event time explicit. Children are known to have difficulties with nominal anaphora, so it seems likely that "temporal anaphora" could cause them similar problems. A concrete proposal for the anaphoric nature of tense is presented in Guéron & Hoekstra (1988) who propose that syntactic tense is essentially an anaphoric relationship between a tense operator in the left edge of the clause and an event variable, which, following Hoekstra & Hyams (1995), may be associated with a verbal inflectional morpheme of tense or agreement. In Guéron & Hoekstra (1988), it is assumed that tense may also be marked deictically. When children are not able to mark tense anaphorically, using a tense chain, Hoekstra & Hyams assume that they do so deictically. This could be what children are doing when they use forms that lack the inflectional morphemes which make the presuppositions about the relationship between speech time and event time explicit.

What kinds of problems occur with nominal anaphora and how do they play out morphosyntactically? In some cases, we find overuse of a morpheme, as in the case of children's overuse of the definite article to mark DPs as definite, even when the referent of the DP is not in the Common Ground (in the sense of Roberts 2003). For example, children might ask their parents, "Where's the dinosaur?" while standing in a room surrounded by 30 dinosaurs, presupposing the presence in the conversational common ground of a specific dinosaur that their interlocutors are familiar with, even when the interlocutors have no idea which specific dinosaur the child is referring

⁶ It is certainly possible in principle to test noun agreement across clauses, as in "Yesterday I saw Billy, Tommy and Mary. Those kids were sure tired." though to my knowledge this kind of test has not been done.

to. The phenomenon is explored experimentally, for example, in Maratsos (1974) for child English speakers.⁷

We argue that children's optional use of nonfinite verbs could be seen as a failure to take the discourse-pragmatic presuppositions of their interlocutors regarding tense into account, on analogy with the case of definiteness marking. The optionality of occurrence of nonfinite forms with finite forms is a function of the gradual integration in development of the interface between pragmatic and syntactic knowledge. The delay in the integration of this kind of information is, by now, well-established not only within language-internal domains of cognition, but also between aspects of language and non-linguistic domains of cognition, including language and spatial cognition (Landau & Jackendoff 1993), language and number (Grinstead, MacSwan, Curtiss & Gelman 1998) and language and memory (Gibson 1998). We refer to this hypothesis as the Tense Interface Delay (TID) Hypothesis, in Pratt & Grinstead (2007a).

(14) The Temporal Interface Delay Hypothesis – children have adult-like morphosyntactic competence, but lack adult-like access to discourse-pragmatic information regarding tense and consequently allow verb forms which may either mark tense through a T-chain in the adult way, or deictically when they assume that their interlocutors share their access to discourse-pragmatic tense information.

An advantage to the TID is that it subsumes the optional infinitive phenomenon to the larger phenomenon of syntax-pragmatics delay and even larger phenomenon of Interface Delay, described above. If the syntax-pragmatics delay is fundamentally a problem of children failing to take the perspective of their interlocutors into account in some way, then it could be attributed to the delay in the development of the belief tracking dimension of Theory of Mind (Wimmer & Perner 1983). This is a further advantage because the timing of False Belief development is approximately the same (between 3;0 and 4;0) as the period that we see comprehension and production of adult-like tense marking develop. Concretely, the typically-developing controls in Rice, Wexler & Hershburger 1998 (cf. Figure 4, p. 1421) progress from marking third singular *-s* in elicited production tasks when they are 3;0 at roughly 40% to marking it near 100% when they are 4;6. For evidence in child Spanish of this leap in adult-like tense marking between and 3 and 4 years of age, consider the following data from Pérez-Pereira's (1989) "Wug" test type elicited production study of, among other things, tense marking on 3rd singular verbs. Table 6 shows the results of an elicited production task with nonce words and Table 7 shows the results of elicited production with real verbs.

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

Table 6 - Percentage Correct with Invented Verbs in Pérez-Pereira (1989)

The percentages improved slightly in the elicited production experiment with real words, as illustrated in Table 7.

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

Table 7 - Percentage Correct with Real Verbs in Pérez-Pereira (1989)

If the belief tracking dimension of Theory of Mind is crucial for adult-like tense marking, then we have an explanation for the fact that a segment of children with autism spectrum disorders (ASD) have been shown to have "extended optional infinitive" type grammars, with serious problems marking finiteness on verbs (Roberts, Rice & Tager-Flusberg 2004). Children on the autism spectrum display a wide variety of linguistic and non-linguistic cognitive profiles, however they are said to have in common the characteristic of failing some types of Theory of Mind tests (Baron-Cohen 1995),

⁷ Grinstead (2004) similarly argues on the basis of low percentages of overt subject use in child null subject languages, that children overuse null subjects as a result of assuming that their interlocutors share their assumptions regarding which referents are salient in the conversational common ground.

including False Belief tasks. We only expect a subgroup of children with ASD to manifest an OI grammar, since older ASD children may come to develop the belief tracking dimension of Theory of Mind (Steele, Joseph & Tager-Flusberg 2003).

Of course if some children with ASD, who characteristically have problems with the various dimensions of Theory of Mind, have an extended optional infinitive grammar, it is worth asking whether children with SLI, for whom the original extended optional infinitive grammar was proposed (cf. Rice, Wexler & Cleave 1995), typically have problems with the belief tracking component of Theory of Mind. If they do, it supports our contention that optional infinitive grammars result from the inability of children to track the beliefs of others. As predicted by the TID, Miller (2001, 2004) shows that child English speakers with SLI perform poorly on tests of False Belief. Interestingly, she shows that they perform more poorly than do their age-matched controls when the language of the False Belief task includes a sentential complement, which De Villiers & Pyers (2002) and De Villiers & De Villiers (2000) have argued to be crucial for an understanding of False Belief. Miller also shows that when language including a sentential complement is excluded from the task, children with SLI are as proficient as their age matches at detecting false belief. This suggests that belief tracking may be independent of sentential complements. A possible interpretation of these facts is that the grammatical constructions that are relevant to false belief tracking (sentential complements, according to De Villiers and colleagues, or tense marking on our account) are particularly difficult for children with SLI.

We hope here to have helped establish the optional infinitive nature of child Spanish and to have suggested a plausible crosslinguistic perspective from which to view the phenomenon which better integrates it into cognitive development and atypical language development, while simultaneously allowing us to assume a version of Very Early Parameter Setting (Wexler 1994), the Full Competence Hypothesis (Poeppel & Wexler 1993) or Early Morphosyntactic Convergence (Hoekstra & Hyams 1995), with respect to children's syntactic development, in the sense that child syntactic competence may be seen to be near fully developed quite early, while giving the appearance of being slow to develop as a result of the slowness of non-linguistic domains of cognition to integrate with language.

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Selected Proceedings of the 10th Hispanic Linguistics Symposium

edited by Joyce Bruhn de Garavito
and Elena Valenzuela

Cascadilla Proceedings Project Somerville, MA 2008

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Pratt, Amy and John Grinstead. 2008. Receptive Measures of the Optional Infinitive Stage in Child Spanish. In *Selected Proceedings of the 10th Hispanic Linguistics Symposium*, ed. Joyce Bruhn de Garavito and Elena Valenzuela, 120-133. Somerville, MA: Cascadilla Proceedings Project.

or:

Pratt, Amy and John Grinstead. 2008. Receptive Measures of the Optional Infinitive Stage in Child Spanish. In *Selected Proceedings of the 10th Hispanic Linguistics Symposium*, ed. Joyce Bruhn de Garavito and Elena Valenzuela, 120-133. Somerville, MA: Cascadilla Proceedings Project. www.lingref.com, document #1790.