

An Elicited Production Test of the Optional Infinitive Stage in Child Spanish

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1. Introduction

In this paper, we investigate the phenomenon known as the Optional Infinitive (OI) Stage in child Spanish. During this stage children optionally mark tense on verbs (e.g. Wexler 1990, 1994, 1998; Boser, Lust, Santelmann & Whitman 1992; Radford 1990, Sano & Hyams 1994, Pratt & Grinstead 2007a among many others), as in the following examples.

- (1) He walk across the street.
- (2) He walks across the street.

While bare stems of the kind shown in (1) are one variety of root nonfinite form, others have been noted across and within child languages in the literature including morphological infinitives, bare past participles and bare progressive participles (Boser, Lust, Santelmann & Whitman 1992; Ferdinand 1996; Hyams 2007, Leonard, Dromi, Adam & Zadunaisky-Ehrlich 2000, Sanz-Torrent, Serrat, Andreu & Serra 2008). In child English, receptive and expressive tasks show that the OI Stage gradually tapers off in typically developing children, ending around 4;6 (Rice, Wexler & Hershberger 1998; Rice, Wexler & Redmond 1999). A wide variety of theoretical accounts of optional infinitive verbs have been presented including accounts in which syntax itself develops, as in Wexler (1998), Hyams (2007) and Rizzi (1994). Other accounts propose that it is the syntax-pragmatics interface that develops, including Grinstead (1998, 2004), Pratt & Grinstead (2007b), Grinstead, De la Mora, Pratt & Flores (in press), Avrutin (1997, 1999), Brun, Avrutin & Babyonyshev (1999).

This study, however, is principally interested in determining the range of cross-linguistic variation of this phenomenon and specifically whether child Spanish (and perhaps by extension other Southern Romance languages) has an OI stage. While this determination will have consequences for detailed implementations of all theories of Optional Infinitives, though it will not provide evidence that can adjudicate among them. Our questions are as follows:

- How much cross-linguistic variation is there in this phenomenon?
- Are languages really different with respect to whether children optionally mark tense?
- Specifically, is Spanish fundamentally different from other languages in this regard?

Our goal in this study is to show that there is an OI stage in Spanish with three kinds of evidence:

- An elicited production task of verb finiteness in typically-developing (TD) children.
- Paired elicited production and Grammaticality Choice tasks in TD children to validate the Grammaticality Choice format and previous OI findings in child Spanish.

- The same elicited production task with children with specific language impairment (SLI) to show that there is an Extended Optional Infinitive stage in this population (cf. Rice & Wexler 1996).

2. Background

Many spontaneous production studies of child Spanish and other Southern Romance languages have concluded that children produce few, if any, nonfinite utterances (cf. Grinstead 1994 and Torrens 1995 for Spanish; cf. Torrens 1995, Grinstead 1994, Bel 2001 for Catalan; cf. Guasti 1994 for Italian). Many other studies have shown the existence of verb forms that could be root infinitives (Hernández-Pina 1984, Radford & Ploennig-Pacheco 1995, Davidiak & Grinstead 2004, Clahsen, Avelado & Roca 2002, Licerias, Bel & Perales 2006, Buesa 2006, Sanz-Torrent, Serrat, Andreu & Serra 2008).

Further, elicited production studies by Pérez-Pereira (1989) and Kernan & Blount (1966) have also shown that child Spanish speakers produced third person singular forms, which we take to be potential nonfinite bare stems in Spanish.

	3 year-olds	4 year-olds	5 year-olds	6 year-olds
Preterite 3rd Sg.	48%	74%	73%	76%

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

While these studies make a valuable contribution to what is known about child Spanish speakers' use of finiteness marking, they unfortunately only tested third person past (simple preterit) and present tense, making it impossible to know how children managed forms inflected for other person and number combinations.

Using a McDaniel & Cairns (1990) type Grammaticality Judgment task, Pratt & Grinstead (2007a) asked for child Spanish-speakers' judgments of nonfinite sentences. In this study (n = 15 Age range 4;1 - 5;10, mean age = 5;1), children were shown actions performed by Flash animated characters. Then, they listened to 1 puppet summarize what had happened and were asked to give a grammaticality judgment of the puppet's sentence.

	Present	Past	Overall
Grammatical	40/60 (67%)	46/60 (76%)	71.67%
Ungrammatical	120/165 (73%)	142/195 (73%)	72.77%
<i>Total</i>	160/225 (70%)	188/255 (75%)	72.5%

Table 2 – Percent Correct From Pratt & Grinstead (2007a) Grammaticality Judgment Task

Following up this study, Pratt & Grinstead (2007b) changed the task so as to allow children to hear both the adult-like option and the putative child Spanish optional infinitive forms. The motivation for this, following Reinhart (2004), was to reduce the task demands by not asking children to generate a comparison sentence of their own.

	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 3 – Percent Correct Choice From Pratt & Grinstead (2007b) Grammaticality Choice Task

We found that using this “Grammaticality Choice Task” reduced attrition dramatically - fewer children were excluded for failing filler questions and apparently the task was less demanding. Further, children were better at it - the scores of 5 year-olds rose from 73% to 87%, as illustrated in Table 3, suggesting that the new format was possibly a better reflection of grammatical competence.

In summary, spontaneous production studies have produced mixed results regarding the existence of optional infinitives in child Spanish. Elicited production studies seem to show lower proficiency, with children producing bare stem forms, suggesting the existence of an OI stage. Grammaticality Judgment studies also show older children with lower proficiency, strengthening the position that there exists an OI stage in child Spanish. However, to be confident about the existence of an OI stage in child Spanish, we should see converging sources of evidence for it, which leads us to our first question: Will an elicited production study, testing person-number combinations other than 3rd singular, nonetheless produce bare stems?

3. Experiment 1 – Elicited Production

3.1 Participants

38 monolingual Spanish-speaking children in Mexico City participated in this study. Their ages ranged from 3;5 to 6;5, and their mean age was 5;1. While this may seem old for studying the optional infinitive stage, we reiterate that at the lower end of this age range, the children in the Rice & Wexler studies alluded to earlier were firmly in the OI stage.

3.2 Procedures

It was explained to the children that they were going to meet some animals who were still learning to talk and did not always describe what they saw in the pictures correctly, so it would be the children’s job to help them get better at doing this by correcting them. Children were shown pictures of a turtle, a dog and a cat performing actions (verbs from Spanish MacArthur CDI - Jackson-Maldonado, Bates & Thal 1992). A puppet, corresponding to one of these animals, then describes its own actions in the picture correctly and the actions of the other puppet incorrectly, to elicit a correction. For example, a child would be shown a picture of a dog, a cat and a turtle opening their mouths, as in Figure 1.



Figure 1 – A Sample Picture of the Actions Shown To Children

The cat puppet then says to the dog puppet, “Here you, dog, are opening your mouth and here I’m closing the door.” *Aquí tú, perro, abres la boca y aquí yo cierro la puerta.* The cat puppet then says to the dog puppet, “That’s not right. Here I... am opening my mouth.” *No es verdad. Aquí yo... abro la boca.* The experimenter completes the first sentence, as a model. In subsequent examples, children are told that it is their turn to correct the puppets, by finishing the sentence.

For the experiment, 3 predicates were used: *Abrir la boca* - open your mouth, *Comer galletas* - eat cookies, *Bailar* – dance. Also, 7 possible subjects were used: 4 pronouns: *Yo, nosotros, ustedes, ellos* and 3 full DPs: *el gato, el perro, la tortuga*. This produced 15 experimental items. There were also 5 filler items - children had to pass all fillers to be included. 8 children failed at least one filler and were excluded.

3.3 Results

Our results are summarized in Table 4.

	Number Correct	Percent Correct
3 and 4 Year-olds (n=10)	117/142	84%
5 and 6 Year-olds (n=20)	285/299	95%
Total	402/441	91%

Table 4 – Results of the Elicited Production Task, By Age

Children’s scores correlate with their ages. Pearson correlation = .505, $p = .004$, two tailed, indicating that this measure of language development grows in tandem with chronological age.

Among the errors children made, represented in Table 5, we find two prominent forms which seem likely to be OI forms, the bare progressive participle and the bare stem. The most common error, however, was a 2nd/3rd plural present tense form, which we believe was a task effect. Namely, because there were always multiple characters in the images shown the children, it is possible that the children ignored the prompt and simply said either “They are eating.” or addressed the characters in the picture as a group and said “You are eating.”.

Verb Form	2nd/3rd Pl. Present comen	Progressive Participle comiendo	Bare Stem come	2nd Sg. Present comes	1st Sg. Present como	1st Sg. Past comí
% of Errors (#)	33% (13)	26% (10)	23% (9)	10% (4)	5% (2)	3% (1)

Table 5 – Error Analysis of the Elicited Production Task

In summary, Spanish-speaking children vary in their ability to produce adult-like tense marking on verbs, as measured by this test, as a function of age. Errors include at least two prominent forms which are likely OI forms: bare stems and progressive participles.

4. Experiment 2 – Grammaticality Choice

Given that we now have a new source of evidence that child Spanish speakers pass through an Optional Infinitive Stage, we would like to know if this data can be related to existing data which supports the same claim. Specifically, in this experiment we ask whether the elicited production results just presented validate the Grammaticality Choice results and the previous findings of an OI stage found using a Grammaticality Choice Task (Pratt & Grinstead 2007a). We will seek to answer this question by determining whether the Elicited Production measures correlate with Grammaticality Choice measures of child Spanish knowledge of finiteness.

4.1 Participants

The participants in this experiment were a subgroup of the children who participated in Experiment 1. There were 22 monolingual Spanish-speaking children with an age range between 3;7 and 6;5. Their mean age was 5;2.

4.2 Procedures

The children were given the Grammaticality Choice Task of Pratt & Grinstead (2007b) in the present tense only. This test consisted of 17 experimental items and 5 filler items. Children had to pass at least 4 of 5 fillers and have completed the Elicited Production Task successfully to be included. In the Grammaticality Choice Task, the investigator shows the child pictures in which the puppets are carrying out an activity. Upon seeing the pictures, each puppet utters a sentence with either an adult-like verb or a nonfinite verb form.



Figure 2 – The Images, Puppets and Stimuli Used

4.3 Results

The results of the experiment are given in the third row of Table 6, which also gives, for comparison, the results of the elicited production task in Experiment 1.

N = 22	Mean	Standard Deviation
Elicited Production	93.17%	11.49%
Grammaticality Choice	77.27%	19.99%

Table 6 – Results of Experiment 1 (2nd Row) and Experiment 2 (3rd Row)

The 22 children’s scores on the elicited production test and the grammaticality choice test are correlated: Pearson correlation = .652, $p = .001$, two-tailed.

In summary, the results of the Elicited Production task in Experiment 1, which correlate with age, also correlate with the results of the Grammaticality Choice Task in Experiment 2. Both kinds of data converge in supporting the existence of an OI stage in child Spanish. The Grammaticality Choice task is validated by the elicited production results.

5. Experiment 3 – Elicited Production With Children with SLI

Further converging evidence of an OI stage in child Spanish comes from children with specific language impairment (SLI). The Extended Optional Infinitive stage (Rice & Wexler 1996) has been hypothesized to explain why child English speakers with SLI have problems marking tense which are similar in character to those of typically-developing English-speaking children, but more severe. If child Spanish has an OI stage, we expect that child Spanish speakers with SLI will have problems marking tense which are similar in character to typically-developing child Spanish, but more severe – an Extended Optional Infinitive stage in child Spanish.

5.1 Participants

21 Spanish-speaking children diagnosed with SLI participated in this experiment. In order to be included in the SLI group children had to pass conventional exclusive criteria:

- Normal hearing.
- No otitis media.
- No physical/social problems.
- No frank neurological damage.
- No problems of oral structure.
- Non-verbal IQ > 85 on WPPSI, Spanish version.

Further, children had to pass the standard inclusive criterion, namely, have standardized language scores of at least 1.25 standard deviations below the mean as measured by the Bateria de evaluación de la lengua española (Rangel, Romero & Gómez 1988). In addition, we identified children as having SLI by family history questionnaire (Restrepo 1998) and required that they pass a phonological screen to assure that they could pronounce the segments of interest in nonce words: /es, as, an, en, o, ó, a, e, é, mos/.

In addition to our SLI sample, we tested 21 typically-developing Spanish-speaking children. In order to be included in this group, children’s test scores had fall within 1.25 standard deviations of the mean on the standardized language test (BELE - Rangel, Romero & Gómez 1988). All passed the phonological screen mentioned and there were no reported language problems from parents or teachers for any of them.

5.2 Procedures

The procedures for this experiment were the same as those described for the elicited production experiment in Experiment 1.

5.3 Results

The results of Experiment 3 are summarized in Table 7, which gives mean scores and standard deviations for both groups.

	Mean	Standard Deviation
Age Controls (n = 21)	94.90%	6.29%
SLI (n = 21)	82.45%	15.05%

Table 7 – Results of Elicited Production Task With SLI and Age Control Groups

Figure 3 illustrates the significantly better scores of the age-control group (“TD” for typically-developing) in contrast to the mean score of the SLI group.

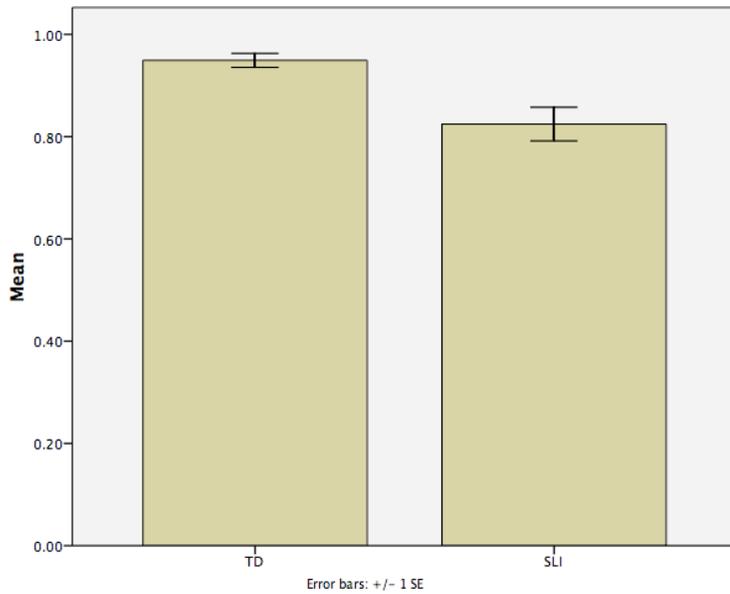


Figure 3 – Mean Scores of the SLI Group Compared With Those of the Age-Control Group (“TD” For Typically-Developing)

The difference between the SLI group mean percentage correct and the age control group mean percentage correct is statistically significant, for a paired samples t-test, $t(20) = 3.895$, $p = .001$, two-tailed.

Verb Form	2nd/3rd Pl. Present comen	Progressive Participle comiendo	Bare Stem come	2nd Sg. Present comes	1st Sg. Present como	1st Sg. Past comí
% of Errors (#)	50% (15)	0% (0)	43% (13)	3% (1)	3% (1)	0% (0)

Table 8 – Error Analysis of the Elicited Production Task For the SLI Group

As in Experiment 1 with the typically-developing group, we found in the SLI group that there was a task effect which appeared to make the 2nd and 3rd person verb form a prominent error. Also, as in the first experiment, we found that children produced a great many bare stem forms, which we take to be OI verb forms. Unlike the typically-developing children in the first experiment, the children from the SLI group did not produce any bare progressive participle errors, which we found surprising given that they were produced to some degree in their spontaneous speech.

Summarizing, these results are consistent with the existence of an Extended Optional Infinitive stage in the grammars of child Spanish-speakers with SLI. This corroborates the findings of Grinstead, De la Mora, Pratt & Flores (in press) which show that verb finiteness marking distinguishes Spanish-speaking children with SLI from both an age control group and an MLU control group, using the Grammaticality Choice Task. The scores from that test are given in Table 9. The significant differences among the groups are illustrated in Figure 4. In this study, a main effect for group was found, $F(2, 24) = 18.224$, $p < .000$. Further, post-hoc tests of Least Significant Differences showed the

scores of the SLI group to be significantly worse than those of the language control group ($p < .000$) and significantly worse than those of the age control group ($p < .000$).

	Past	Present	Average	Standard Deviation
SLI	51.39%	54.90%	53.15%	13.35%
MLU	72.92%	77.78%	75.35%	14.33%
AGE	84.01%	87.54%	85.78%	5.54%

Table 9 – Grammaticality Judgment Results From SLI, Age Controls and Language Controls From Grinstead, De la Mora, Pratt & Flores (in press)

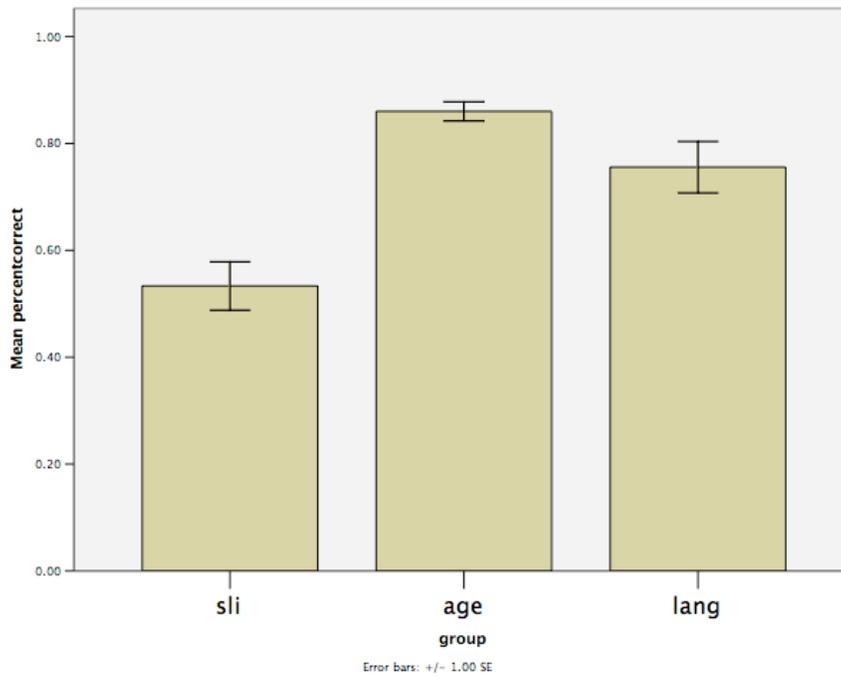


Figure 4 – Significant Differences Among SLI, Age Control and Language Control Groups From Grinstead, De la Mora, Pratt & Flores (in press)

5.4 Discussion

Summarizing, our study constitutes a Spanish-language cross-validation of the argument of Rice & Wexler (1996) that at least one important dimension of the SLI disorder is a representational deficit rooted in grammatical tense.

6. Conclusion

Our results suggest that receptive measures of finiteness marking could be useful as a clinical marker of SLI. Further, three sources of converging evidence all appear to show that child Spanish-speakers pass through an Optional Infinitive Stage: a Grammaticality Choice Task with typically-developing children, an elicited production task with typically-developing children and an elicited production task with children diagnosed with SLI.

Our interpretation of these results is that for typically-developing children, passing through the OI stage, tracking temporal anaphora is difficult. Similarly, children have been shown to have difficulties tracking nominal anaphora with definite articles in English (Maratsos 1974), null subjects in Spanish (Grinstead 2004), pronouns in English (Avrutin 1999) as well as other discourse-sensitive

constructions. While we have not presented evidence that specifically supports our account of this phenomenon, we hope to have contributed convincing evidence that the phenomenon is relevant to child Spanish and possibly other child Southern Romance languages. Any crosslinguistic account of the Optional Infinitive phenomenon should account for these results for Spanish.

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