# The Complexity of the Spanish Subjunctive in Bilingual Children with SLI

**Anny P. Castilla-Earls**,
University of Houston

**Ana Teresa Perez-Leroux**,
University of Toronto

**María Adelaida Restrepo**,
Arizona State University

**Daniel Gaile**, and
SUNY Buffalo

**Ziqiang Chen**
SUNY Buffalo

## Abstract

This study investigated the use of the Spanish subjunctive in bilingual children with and without specific language impairments (SLI). Using an elicited production task, we examined: (1) the potential of the subjunctive as a grammatical marker of SLI in Spanish-English bilingual children, (2) the extent to which degree of bilingualism affects performance, and (3) the specific patterns of errors across groups. The participants in this study were 16 children with SLI and 16 typically developing children (TD) matched on age, English language proficiency, and mother's education level. Bilingual children were selected based on their English proficiency and were classified either as Spanish-dominant children with intermediate English proficiency (asymmetrical bilinguals, AsyBi), or near-balanced bilinguals (BalBi). A completion task elicited the subjunctive in complement, purpose and temporal clauses. Results suggest that (1) level of bilingual proficiency, language clinical status, and age predicted of the accurate production of the subjunctive, (2) temporal clauses might have a better potential to discriminate between TD children and children with SLI in bilingual settings, and (3) tense underspecification errors were common in children with SLI. This study provides general support for grammatically targeted approaches to assessment in bilingual populations, and for theoretical approaches that link SLI to tense deficits.

## 1. Introduction

This study is part of a series of studies investigating potential grammatical markers of specific language impairments in Spanish-English bilingual children. Our general aim is to find which grammatical markers have good classification accuracy and less vulnerability to changes in bilingual proficiency. In this article, we investigate the potential of the subjunctive in complement (volitional) and adverbial (temporal and purpose) clauses as markers of SLI in Spanish-English bilingual children.

Various methodological approaches have been used in the literature to identify children with SLI. The normalization or normed-based approach, most commonly used with monolingual children, relies on the assumption that children with language disorders represent the lower end of a normal distribution of language skills. Linguistically targeted approaches aim to find specific language structures that can differentiate typical children from children with language disorders (e.g. Rice, Wexler & Cleave 1995). Dynamic approaches target the underlying ability of a given child to learn language instead of what the child already knows (e.g. Peña et al. 2008). Last, there are processing approaches that posit deficits of non-linguistic skills, and rely on general measures such as non-word repetition (e.g. Dollaghan & Campbell 1998).

There is a growing consensus that normalization approaches are suboptimal for bilingual children, given the inherent variability of bilingual populations (e.g. Morgan, Restrepo & Auza 2013). Bilingual children may experience substantial fluctuations in their linguistic context, with concomitant changes in language dominance and relative bilingual ability. This variability in language profiles poses a challenge for normalization approaches. Therefore, the other approaches appear more promising. Dynamic approaches are optimally built on the basis of a clear understanding of the specific grammatical vulnerabilities of a given population. So, for less studied language groups, with limited descriptive characterization of the forms of language deficits, grammatically targeted approaches provide an optimal point of departure.

The assumption of the grammatically targeted approaches is that SLI is a primarily grammatical disorder (although other language components can be affected, Friedman & Novgorodski 2011), and that the effects of language impairment are grammatically selective. That is, not all dimensions of grammar will necessary be equally delayed. The best known of the grammatical approaches is the Extended Optional Infinitive Account, which specifically identifies finiteness/tense as specific locus of impairment (EOI; Rice, Wexler & Cleave 1995). Rice, Wexler & Cleave (1995) argued that children with SLI go through an extended period of time in which they omit tense markers. The observation that children with SLI experience difficulty with tense marking appears generally validated across languages. For Spanish, tense-marking difficulties seems to be less salient than difficulties at the level of the noun phrase in Spanish-speaking (SS) children, but arguably, still significant (Bedore & Leonard 2001). Third person singular errors represent a substantive portion of the morphological problems in children with SLI in Bedore and Leonard's elicited data. Grinstead (2009) shows that SS children with SLI judge bare stems and infinitives as grammatical (in lieu of inflected forms) more often than TD children in a grammaticality choice task. Given that third singular forms in Spanish are equivalent to uninflected forms, including them may lead to overestimate performance. As a consequence, Grinstead et al. (2014) argue that contextual coding is required to properly evaluate Spanish children's finiteness errors.

Some grammatical accounts for the tense deficit in SLI characterize impairment in terms of structural complexity. For instance, Clahsen et al. (1997) identifies agreement among phrase structure features as the source of difficulty for children with SLI. Rice et al. (1998) propose the Unique Checking Constraint (UCC), which posits that children tend to check features

once, but both T and D have to be checked. These complexity-based accounts have been extended from tense to other properties of grammar. Jakubowicz & Nash (2001) propose the Computational Complexity Hypothesis, where computational complexity depends on the complexity of functional features, their obligatoriness and syntactic and semantic status. Marinis (2011) highlights the role of low phonetic saliency, noting that the computational complexity hypothesis establishes an explicit link between an early deficit in the processing of phonology and later deficits in phonology, syntax, and the lexicon, as do Correa & Augusto (2011). However, proponents of the computational complexity hypothesis, such as Jakubowicz (2011), make it clear that that complexity can refer to configuration alone, encompassing deficits that pertain to long distance dependencies such as *wh*-movement. Similarly, Van der Lely et al. (2011) describes difficulties in terms of the complexity imposed by the hierarchical structural dependencies at the clause level.

A different approach is found in Grinstead (2014) Interface Delay Hypothesis. Under this proposal, properties acquired late in TD and severe deficits in SLI are those "that require an interface between these grammar-internal domains of language and the grammar-external domain of discourse-pragmatics". These would include constructions related to nominal anaphora and temporal anaphora, which require coordination of discourse representation and sentence level linguistic encoding. However, as pointed out by Schulz (2011), limiting description of deficits to the pragmatic interface can be problematic, given evidence that some purely semantic processes (specifically, pairing of multiple wh-questions, and exhaustivity) are also distinctly impaired in SLI.

In sum, linguistic accounts of SLI concur that deficits are selective, but disagree as to whether the source of difficulties are primarily a) structural (originating in difficulties with agreement and/or feature checking mechanisms or configurations), b) related to limitations on the processing of phonological representations and the impact of these limitations on building the system of features in a grammar, or c) pragmatic, pertaining to the integration to discourse representations.

## 2. Background

### 2.1 Morphological structure and semantic distribution of the Spanish subjunctive and how children learn it (in monolingual settings)

Spanish verbs mark for mood, a grammatical category that encodes the speaker's attitude with respect to the event denoted by the verb. Indicative is the default mood for assertions, whereas the subjunctive mood associates with expression of desire, doubts, possibilities, commands and personal evaluations. The use of the subjunctive mood is obligatory in certain contexts, such in embedded clauses complements to verbs of desire (1), obligation (2)–(3), in purpose clauses (4), and in temporal clauses where the embedded event has not yet occurred (5)–(6).

(1)    Quiero que hagas la tarea

       want-IND-PRS-1SG that do-SUBJ-PRS-2SG the homework

       'I want you to do your homework.'

**(2)** La mamá le pidió que se bañara

The mother her-CL ask-IND-PAST-3SG that SELF bathe-SUBJ-PAST-3SG

'Her mother asked her to take a bath.'

**(3)** No deja que bote la ropa

Not allow that throw- SUBJ-PRS-3SG the clothes

'(He) does not let them thrown the clothes.'

**(4)** Abre el libro para que vea los dibujos

open IND-PRS-3SG the book for that see- SUBJ-PRS-3SG the drawings

'(He) opens the book to see the drawings.'

**(5)** Regresemos antes de que llueva

Return- SUBJ-PRS-1PL before of that rain- SUBJ-PRS-1SG

'Let's return before it rains.'

**(6)** No enciendas la tele hasta que termines la tarea

not turn-on- SUBJ-PRS-2SG until that finish SUBJ-PRS-2SG the homework

'Don't turn on the TV until you finish your homework.'

Morphologically, the Spanish verb is composed of a stem, a theme vowel that indicates declension group, a portmanteau morpheme simultaneously indicating tense, mood and aspect (TMA), and a set of person/number agreement morphemes that shows slight variation for certain tenses. The Spanish subjunctive has two tenses: present subjunctive and imperfect subjunctive. The present tense (in both moods) is marked with zero morphology; the main difference between the two moods is a switch in the theme vowel. In the present subjunctive, verbs ending with -*ar* show declension with /e/, and –*er* and –*ir* verbs change to /a/ suffixation. Table 1 demonstrates this morphological contrast with 3Sg and 1Pl persons. This vowel shift occurs only in present subjunctive. Past subjunctive is a fully regular form, with –*ra*- as the Tense/Mood marker slot, as in *hablara/hablaramos*. Finally, across the verbal paradigms 3$^{rd}$ person singular is unmarked. In the subjunctive, the first person is likewise morphologically underspecified so that 1$^{st}$ and 3$^{rd}$ singular form contrast in the indicative but are identical in the subjunctive.

The subjunctive use appears in imperative contexts quite early in the children's language. In longitudinal studies it is reported in command contexts by the second birthday or shortly thereafter (Hernández Pina 1984; López-Ornat, Fernández, Gallo, & Mariscal 1994). Jackson-Maldonado & Maldonado's (2001) cross-sectional study finds it absent in samples taken from 20-month olds but present in the 28-month-old groups. Despite this early morphological mastery, use of the subjunctive varies in children, depending on the context of use. Use of subjunctive with commands appears quite early. Performance with complement clauses is more variable, depending on the type of verbs. Verbs of command and volitionals such as *querer* 'to want' are used early with correct subjunctive complements.

**(7)**     *CHI: Quiero que te sientes. (María, 3;07 Lopez-Ornat database)

            want-1S that you-DAT sit-SUB-2P

            'I want you to sit.'

Blake (1980) found excellent performance in a sentence completion task targeting subjunctive clauses with fixed-selection temporal and purpose clause connectors (*antes que* 'before', *para que* 'for'), as well as temporal connectors for which mood choice is sensitive to tense (*cuando* 'when', *hasta que* 'until', *después que* 'after'). His study showed low rate of errors (around 11%) for adverbials for the 4-year olds.

Despite such early success, there is also evidence that young children may overrely on nonfinite or otherwise unspecified forms. So, in response to a question such as *when should the girl get home*?, speakers may respond with either the subjunctive target (8), or with infinitives (9), or noun phrases (10). These forms are grammatical, but allow the speaker to avoid mood selection.

**(8)**     Antes de que llueva 'Before it rains' (Subjunctive)

**(9)**     Antes de llover 'Before it rains' (Infinitive)

**(10)**     Antes de la lluvia 'Before the rain' (NP)

Sanchez-Naranjo and Pérez-Leroux (2010) conducted a study eliciting production of a variety of temporal clauses focusing primarily on the ability to select mood from tense cues in the story context. Children in their study produced few substitutions, but under-specification was the primary response for clauses with *antes de que* and *cuando*, particularly for 3-year olds, but these dropped for 4- and 5-year olds. Important to note that many responses were not convergent with the complex cues in the stories, and were not included under target responses, although many exhibited correct mood selection. The complexity of the elicitation task, and the strict coding criteria in their study actually underdetermines children's mastery of mood selection. Indicative substitutions were quite low (< 3%) except for the past *antes de que* clauses, where indicative errors made up 15% of the responses.

## 2.2 The subjunctive in children with SLI

To our knowledge, few studies have investigated the subjunctive in Spanish-speaking children with SLI. Sanz-Torrent et al. (2008) studied the productive use of verbs in spontaneous speech in Spanish/Catalan children with and without SLI. Although these authors were not specifically targeting the subjunctive, they found statistically significant differences in the productive use of the subjunctive, with children with SLI producing virtually no instances of the subjunctive in spontaneous speech. In another study, Holts, Jackson-Maldonado & De la Mora (2014) elicited production of the subjunctive in monolingual Spanish-speaking children between the ages of 4;04 and 5;09 from Mexico. Their tasks elicited the subjunctive in adverbial clauses (temporal and purpose), and complement clauses (indirect commands, doubt, volitional, and predicative). Children with TD outperformed children with SLI in all categories, except with complement clauses of verbs of doubt. The greatest difference between TD children and those with SLI was found

for both temporal and purpose clauses. In these clauses, TD children showed almost perfect performance (2.9 correct on average out of 3 tokens), while children with SLI showed low performance (1 correct on average out of 3 tokens). Also relying on elicited language, Morgan, Restrepo & Auza (2013) compared the productive use of the subjunctive in directive and desire complement clauses in TD monolingual and bilingual children with and without SLI. They found that TD children (monolinguals and bilinguals) performed significantly better than children with SLI. Interestingly, Morgan, Restrepo & Auza (2013) found that the use of the infinitive instead of the subjunctive, which is an underspecification error, was the most common error in all four groups of children (around 25% of all responses). The use of the indicative tense was the second most common error, and it was found in higher rates for the children with SLI. Lastly, Gutierrez-Clellen, Simon-Cereijido & Restrepo (2006) used the subjunctive as a testing item in a bilingual assessment battery that differentiates TD children from children with SLI, but unfortunately their report offered no specific information about the group difference or the error types seen in this study. In conclusion, while the information we possess regarding the use of the subjunctive in Spanish-speaking children with SLI is limited, it seems to suggest that the subjunctive could be a potential grammatical marker of SLI for this language group.

### 2.3 The subjunctive in bilingual populations

Developmental data on the acquisition of subjunctive in bilinguals is scarce. Silva-Corvalán (2014) documented the simultaneous acquisition of Spanish and English by two brothers. For these boys, the Spanish subjunctive emerged at 2;05, and was used appropriately and productively across a variety of contexts. They used the subjunctive in commands and in temporal clauses (11), but not always without errors. Their use of purpose clauses showed both indicative (12) and infinitival (13) errors in contexts that would require present subjunctive.

Temporal clauses

 (11) Cuando, cuando policia venga (Brennan 2;06)

   When when police come-SUBJ

   'When the police comes…'

 (12) Yo va a crecer y crecer hasta [que] yo soy un niño grande (Brennan 2;8)

   I go to grow and grow until I am-IND a boy big

   'I am going to grow and grow until I become a big boy'

Purpose clauses

 (13) Para el bicho no picar a yo Brennan 2;05

   for the bug not bite-INF to me

   'So the bug does not bite me'

 (14) Para el sol no me molesta Nico 2;05

   for the sun not me bother-IND

'So the sun does not bother me.'

Silva-Corvalán (2014) observed that the patterns in these children correspond to those of monolinguals at earlier ages, and that reduction in Spanish exposure after 3;06 seems to inhibit further development of the mood system, leading to reduced use of the subjunctive forms.

To learn more about in which contexts the subjunctive is lost or retained in bilingual acquisition we have to rely on studies of adult heritage bilinguals. In Los Angeles Spanish, Silva-Corvalán (1994) found reduction in fixed choice contexts like volitionals, which showed a sharp decrease (from categorical to close to 50%). Further, she also found variable choice contexts where usage went from robust (around 30%) to minimal (12%), with greater loss in contexts where subjunctive use is cued by the discourse. In Miami Cuban Spanish, where loss of Spanish occurs at a slower rate than in Los Angeles, Lynch (1999) found that the subjunctive is relatively stable across generations in categorical contexts (except volitionals, where a substantial reduction was documented). In variable contexts, retention of the subjunctive use seems semantically conditioned. It is used reliably in futurate and irrealis contexts, and lost otherwise. Lynch found no attrition with temporal clauses (*Mañana cuando llegue* 'Tomorrow when I arrive'), hypothetical manner (*como si estuviera en* 'as if I were in…') and purpose clauses. Other domains exhibited loss, including emotive/evaluative predicates (*me gusta que…*'I like that'), relative clauses, and modal use (*yo no hubiera comprado eso* 'I would not have bought that'). Carando (2008) finds reduction of subjunctive across the board, although the loss is more evident in purpose clauses than in volitionals.

Finally, intuitional studies confirm the presence of attrition processes in heritage speakers of Spanish. Montrul (2009) found a decrease of subjunctive use and selection in a written task, along with a loss of semantic intuitions in a task testing the logical relations between mood in temporal and relative clauses, and context. Similarly, Mikulski (2010) showed that heritage speakers of Spanish fail to reject indicative clauses embedded under verbs of desire and influence or permission. This evidence, taken altogether, suggests that typically developing bilingual children may exhibit patterns of loss of the subjunctive. Such attrition patterns may appear similar to patterns of use associated to language impairment.

## 3. Study

To investigate the productive use of the subjunctive in Spanish-English bilingual children with SLI, our study sets out to answer the following questions: (1) Do Spanish-speaking children who differ in language development status (TD vs. SLI) and their bilingual status (AsyBi vs. BalBi) differ on their use of the subjunctive in Spanish?, (2) Is the accuracy in production of subjunctive clauses a potential marker of SLI in Spanish-speaking children with varying patterns of bilingual dominance?, and (3) Are the patterns of production consistent across the different types of subjunctive clauses?

### 3.1 Participants

The participants in this study were selected from a parent database of a study of a screening measure for SS children. All the participants included in the parent database were SS children enrolled in English-only schools in Arizona. The selected participants were 16 children with SLI and 16 typically developing children matched to the children with SLI based on age, English proficiency level, and mother's level of education. There were 10 girls and 22 boys. Children were further classified based on their English language proficiency into Asymmetrical Bilinguals (AsyBi), and near-balanced Bilinguals (BalBi). This classification resulted in the following four groups: AsyBi-TD ($n$=8), AsyBi-PLI ($n$=8), BalBi-TD ($n$=8), and BalBi-PLI ($n$=8). All children passed both a hearing and a cognitive screening.

Children with SLI met the following criteria: (a) score below 73 on the Clinical Evaluation of Language Fundamentals, Spanish–Fourth Edition (Wiig, Secord, & Semel 2006), (b) Parents or teachers reported they were concerned about the child's language development (Restrepo, 1998), and (c) no reports of neurological or hearing problems by parents or teachers. Typically developing children were matched individually to each child with SLI using mother's education level, age (+ or − 4 months) and level of English proficiency.

Two types of bilingual children were included in this study: asymmetrical bilinguals with strong Spanish proficiency but limited English language proficiency (AsyBi) and children who were either balanced or near balanced in their English/Spanish proficiency (BalBi). We used the Spanish-English Language Proficiency Scale (SELPS; Smyk, Restrepo, Gorin, & Gray 2013) and a teacher report to establish children's level of English proficiency. The SELPS is a criterion reference measure. The scores of the SELPS range from 1 to 5, with 1 being equivalent to low language proficiency and 5 to native like production. The second tool used to determine English language proficiency was a teacher report. Teachers were asked to rate each child's ability to speak English using a 5 point scale: "cannot speak English at all", "speaks a little English", "speaks limited English with errors", "speaks fluent English with errors", and "speaks like a native speaker of English".

The children in the AsyBi group had (a) average scores of 2.5 or lower on the English SELPS, indicating low English proficiency, and (b) teacher report of low English proficiency (cannot speak English at all, speaks a little English, or speaks limited English with errors). The children in the BalBi group had (a) average scores of 3.5 or higher on English SELPS, indicating high intermediate to advanced English proficiency, and (b) teacher report of moderate to high English proficiency (speaks fluent English with errors or speaks like a native speaker of English). Parents reported that in all the households Spanish was the main language used up to the age of four, with the exception of one. For this child, parents reported that both parents used Spanish and English at home. However, the SELPS in English and the teacher report clearly placed this child in the AsyBi group.

### 3.2 Experimental Measures and Procedures

We administered a comprehensive elicitation task including various grammatical structures that included a subtest for the subjunctive. The subjunctive subtests consisted of eight

questions followed by a sentence completion task requiring the obligatory use of the subjunctive in object complement clause (three tokens), temporal adjunct clauses (three tokens) and adjunct purpose (two tokens) clauses. For instance, to elicit the subjunctive in a complement directive clause we asked: *¿Qué no deja hacer el policia a los niños? Que…* ('What is the policeman forbidding (not allowing) the children to do?'). This prompt was accompanied by a picture of a policeman signaling a group of children to not cross the street. In this example, the target response was the use of any verb in the subjunctive mood for the 3rd person plural, such as *crucen la calle* 'cross the street', *caminen* 'walk', *pasen* 'walk across'. Other target questions included purpose clauses such as *¿Para que le dio el papá la toalla al niño? Para que…* (Why did the dad give the towel to the boy?' and temporals *No puedes ver la tele hasta que…* (You cannot watch TV until...). Responses were coded using the coding criteria presented in Table 2.

### 3.3 Results

As shown in Table 3, the subjunctive was the primary response to the test items for all groups. However, there were also systematic patterns of morphological substitutions, primarily indicative, infinitive, progressive, as well as number underspecification.

To explore the differences in accuracy across groups, we employed a generalized linear model (GLM) with a cumulative logit link function (McCullagh & Nelder 1989) for our statistical analyses. The BalBi group was on average 16 months older than the AsyBi group (chronological age in months: AsyBi $M$=67, $SD$ 6, range: 55–73; BalBi $M$=83, $SD$=11, range= 68–100; $F$=25.451, $p$<.001). We used GLM to properly take into account this age difference in all our analyses. For the full model, the success probability was modeled as $Logit(p_i) = \beta_0 + \beta_1 \cdot CA + \beta_2 \cdot LEP + \beta_3 \cdot LI + \beta_4 \cdot CA \cdot BIL + \beta_5 \cdot BIL \cdot LI + \beta_6 \cdot CA \cdot LI + \beta_7 \cdot CA \cdot BIL \cdot LI$, where CA, LI, and BIL denote the subject's age (in months), clinical language status (0: TD, 1: SLI), and bilingual status (1: AsyBi, 0: BalBi), respectively. Several reduced models, including a full null model (i.e., with only an intercept term), were fit for accuracy of the subjunctive as the response variable. In both cases, model selection was performed using the Akaike Information Criterion (Sakamoto, Ishiguro & Kitagawa 1986). Table 4 provides a summary of results of the five best models for the subjunctive accuracy counts. The AIC selected model for correct subjunctive counts is listed in the first row and is given by $Logit(p) = -1.332 + 0.03578CA - 0.784BIL - 1.214LI$. In this model, chronological age in months, language impairment, and English language proficiency were significant factors predicting the accuracy of subjunctive production.

Figure 1 displays the plotted count data points for subjunctive accuracy (converted to percentages) and the AIC selected model fit curves. These results suggest that all three factors (age, English proficiency, and language impairment) played a role for the accurate production of the subjunctive. We observe an increasing pattern of subjunctive accuracy with age for both English proficiency groups, with BalBi children performing slightly better than the AsyBi group. This suggests that the development of the subjunctive in these children has not been halted. The difference between TD and SLI is clear for both groups regardless the age, with TD children outperforming the children with SLI in both bilingual groups.

The analysis by items revealed that there were different response patterns across the various clause types; Figure 2 summarizes accuracy for temporal, complement clause with directive verbs and purpose clauses. Although the sample size is relatively small, a statistically significant difference was found for temporal clauses ($F_{3,28}$=4.636, $p$ <.001), with higher accuracy rates for TD than children with SLI in both bilingual groups (AsyBi: $t$ =2.732, $p$ = 0.011, $d$= 1.56; BalBi: $t$=2.483, $p$= 0.019, $d$=1.11). No other test was significant in this analysis.

**3.3.1 Error Analysis—**We also sought to understand the type of morphological errors children were using. We classified children's verbal responses according to type of morphological errors (see Table 5).

A quick inspection of the data in Table 5 shows that while SLI children make generally more errors than TD children, these errors are not across the board. The differences between the verbal responses of atypical and typical children cluster around person or tense underspecification errors (shown within the shaded area in Table 5). For the typically developing children, these types of errors totaled 8 in each bilingual group (approximately 15% of all verbal responses), and approximately double for the atypical children (approximately 30% of all verbal responses).

## 5. Discussion

In this study we investigated the potential of the subjunctive in complement and adverbial clauses as markers of SLI in Spanish-English bilingual children. First, we explored general differences in the accurate production of the subjunctive in AsyBi and BalBi children with and without SLI. The results of the GLM analysis indicated that children's chronological age, level of bilingualism, and clinical language status (TD vs. SLI) predicted their accuracy of subjunctive production. These findings are in agreement with Holts, Jackson-Maldonado & De la Mora (2014), Morgan, Restrepo & Auza (2013) and Sanz-Torrent et al. (2008) who also found group difference between SS TD children and children with SLI. Differences in the bilingual group were also significant in our GLM analysis, with BalBi children, who were older than the AsyBi, performing slightly better. These results further suggest that the production of the subjunctive does not seem to be particularly affected by changes in bilingual proficiency, at least in these two groups of children. Perhaps, the effect of language loss for the subjunctive only becomes apparent in adulthood, after sustained reductions in language exposure (Lynch 1999; Silva-Corvalán 1994).

Our results suggest that the subjunctive is viable marker of SLI in (younger) Spanish-English bilingual children because (1) it seems to be relatively stable despite changes in bilingual proficiency, and (2) it identifies group differences between TD and children with SLI. For identification/diagnostic purposes, it is imperative to design tasks that show large and less variable differences between typically TD and children with SLI because these differences are more likely to have discriminatory power.

Interestingly, our results suggest that temporal clauses are more likely to show group differences between TD children and children with SLI than volitional and purpose clauses.

Mood selection in temporal clauses depends on the tense of the matrix clause, and the time of the event in the embedded clause. These results are in line with Holts, Jackson-Maldonado & De la Mora (2014) who also reported that temporal clauses showed a large difference between affected and unaffected children. These preliminary results suggest that diagnostic measures should target temporal clauses, instead of volitional clauses.

A careful grammatical examination of our data revealed intriguing qualitative patterns. Our results support Grinstead's argument that tense is a domain affected in Spanish SLI. The magnitude of the verb effects is often small, which might have limited the impact of his important observations in the clinical field. The error patterns seen in this study clearly point to tense and agreement underspecification, such as those described in the work of Grinstead and colleagues. These patterns of underespecification were also evident in Morgan, Restrepo & Auza's (2013) study, in which the most common error pattern was the use of infinite verbs consisting of around 20–30% of all responses. However, they observed this pattern of error in similar rates for both TD children and children with SLI. Unfortunately, other studies of the subjunctive in SLI do not describe specific error patterns, so the need remains for further exploration.

Our Spanish data generally contrast with data reported for Greek embedded clauses in Mastropavlou & Tsimpli (2011). These authors observed few errors in the verb forms. However, children with SLI in their study differed from children with TD in terms of the rates of omissions of complementizers varied with clause type. The definite complementizer *pu*, which iintroduces factive complements of verbs of perception and emotional state is used target like. In contrast, the complementizer *na* which plays primarily an inflectional role, i.e. as a mood marker of a tense-dependent clause, was frequently omitted in complement clauses, yet, retained in adverbial clauses. This contrast between two mood-encoding languages illustrates the challenges of making predictions about impairments across languages.

In sum, our results show that deficits with the subjunctive mood are closely associated with tense, in two distinct ways. One is morphological, in that the most frequent errors related to incorrectly producing the least specified form (third singular), or the two nonfinite forms (infinitives and progressives). The other is structural/semantic, in that error rates with atypical children were more frequent with temporal clauses, where mood selection depends on tense of the main clause, and the temporal sequence is established by the clausal connector itself. Two conclusions can be drawn from this data: (1) Grammatically targeted approaches offer promising solutions to the problem of assessing children along the bilingual continuum, and (2) Our data supports the hypothesis that tense is affected in Spanish SLI.

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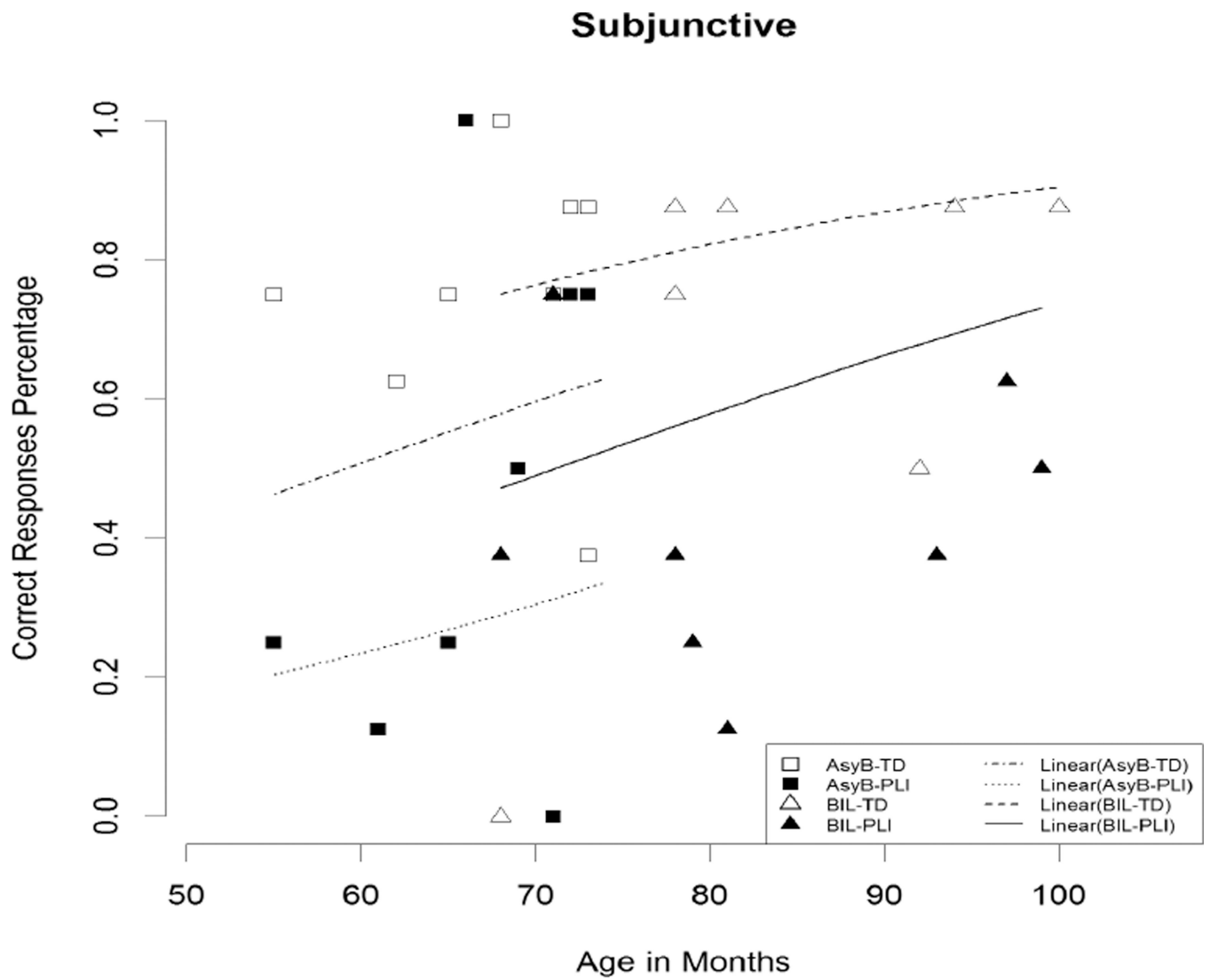
**Figure 1.**
Scatter and regression plot for correct response rates as a function of age for the subjunctive, grouped by different combinations of language impairment and bilingual status groups. Plotted points correspond to observed response percentages and are symbol coded according to subject language impairment and bilingual status. Plotted lines correspond to the predicted values obtained from the AIC optimal models identified in Table 4.
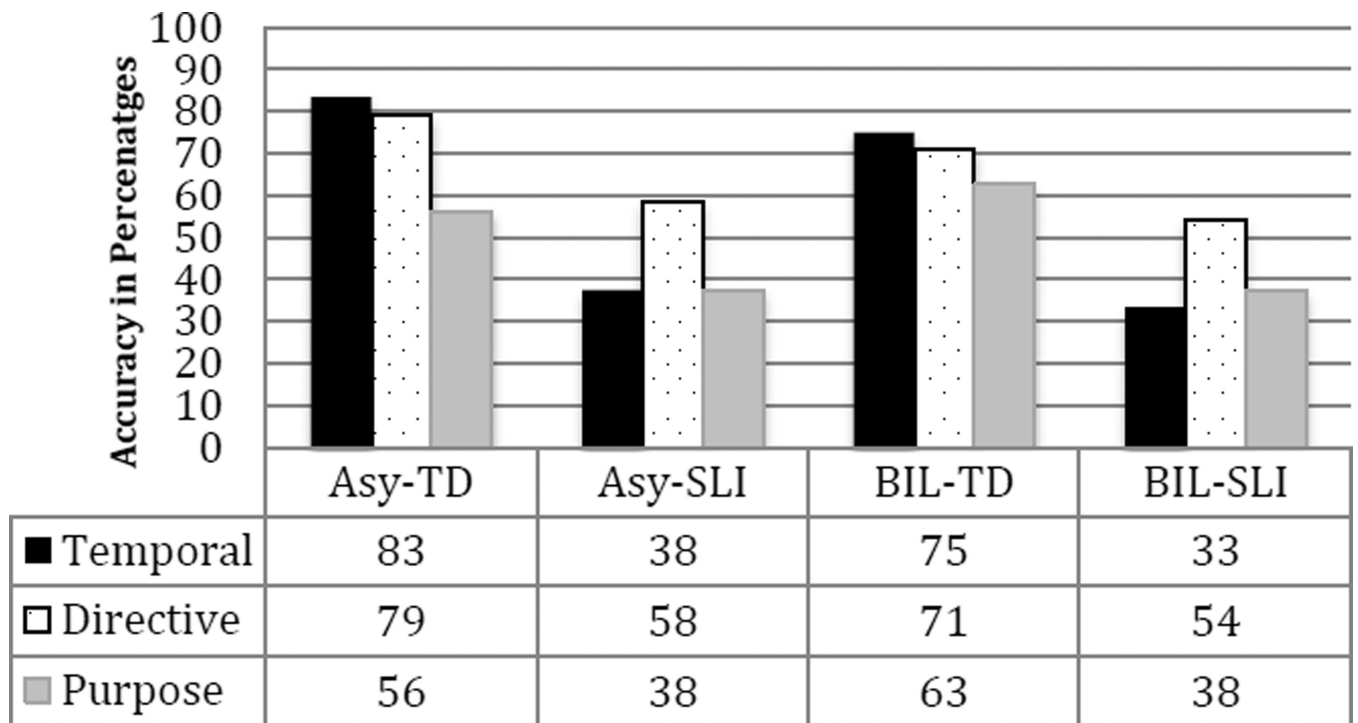
**Figure 2.**
Accuracy for Temporal, Directive and Purpose Clauses

**Table 1**

Subjunctive and Indicative Marking in Spanish

|  | **Indicative** |  |  | **Subjunctive** |
|---|---|---|---|---|
| Group | 3Sg/1Pl |  |  |  |
| *-ar* | habla/hablamos | → | hable/hablemos | 'He speaks/we speak' |
| *-er* | come/comemos | → | coma/comamos | 'He eats/we eat' |
| *-ir* | escribe/escribimos | → | escriba, escribamos | 'He writes/we write' |

**Table 2**

Coding Categories and Examples for The Subjunctive Completion Task

| Coding Category | Example |
| --- | --- |
| Question | *Que no deja hace el policia a los niños? Que…*<br>(What doesn't the police allow the children to do?) |
| SUB: Subjunctive | *Que cruzen/Que Pasen* ('that they cross'); *Que caminen* 'that they walk' |
| ER3sg: Person error | *Que pase* (Exclusively use of 3Sg for other form, 3Pl in this example) |
| IND: Indicative | *Pasan* |
| INF: Infinitive | *Parar* |
| IND+ER3sg | *Cruza* |
| PRO: Progressive | *Estaban caminando* |
| OTH: Other verb error | *Que no croses (root + 3sg)* |
| ENG: English | Stop |
| FRA: Fragment | *El señor* 'The man' |
| UNR: Unrelated | *No se puede* 'It's not allowed.' |
| NR: No response | *No se* 'I don't know', or no answer. |

**Table 3**

Reponses to the subjunctive task in percentages by coding category.

| | SUB | IND | INF | PRO | OTH | ER3sg | IND+E R3sg | UNR | NR | FRAG | ENG |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AsyBi TD | 75 | 5 | 6 | 2 | 2 | 0 | 2 | 0 | 6 | 3 | 0 |
| AsyBi SLI | 45 | 5 | 8 | 9 | 3 | 2 | 2 | 6 | 16 | 2 | 3 |
| BalBi TD | 70 | 8 | 5 | 0 | 5 | 5 | 2 | 0 | 6 | 0 | 0 |
| BalBi SLI | 42 | 14 | 8 | 8 | 5 | 0 | 8 | 5 | 0 | 3 | 8 |

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**Table 4**

General Linear Model Selection with Correct Subjunctive Counts as an Endpoint.

| Intercept | CA | BIL | LI | CA:BIL | CA:LI | BIL:LI | CA:BIL:LI | AIC | p-value* |
|-----------|------|------|------|--------|-------|--------|-----------|-----|----------|
| −1.332 | 0.03578 | −0.784 | −1.214 | NA | NA | NA | NA | 149.0 | < 0.001 |
| −2.175 | 0.04837 | 0.3665 | −1.209 | −0.01635 | NA | NA | NA | 150.8 | < 0.001 |
| −1.726 | 0.04109 | −0.7836 | −0.5482 | NA | −0.008934 | NA | NA | 150.9 | < 0.001 |
| −1.284 | 0.03552 | −0.8399 | −1.269 | NA | NA | 0.1092 | NA | 151.0 | < 0.001 |
| 0.9383 | NA | NA | −1.19 | NA | NA | NA | NA | 151.2 | < 0.001 |

**Table 5**

Counts of verbal responses classified for morphological patterns in to Target (3rd person, and other forms), person errors of comission, person errors of omission (where 3Sg is realized), and temporal underspecification errors (bare infinitives and progressives), and mood selection errors (indicative).

| | Target Other person | Target 3Sg | Other Person Errors | Errors 3Sg | INF | PRO | IND | Verbal responses | Percentage undersp. errors |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Morphological analysis | | | | | |
| AsyBi-TD | 20 | 28 | 0 | 2 | 4 | 1 | 3 | 58 | 12% |
| BalBi-TD | 17 | 28 | 0 | 7 | 3 | 0 | 5 | 60 | 17% |
| AsyBi-SLI | 10 | 19 | 1 | 3 | 5 | 6 | 3 | 47 | 30% |
| BalBi-SLI | 7 | 20 | 0 | 6 | 5 | 5 | 9 | 50 | 31% |