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Prototypical tense–aspect alignment and the tense deficit in the spontaneous speech of Spanish-speaking children with SLI

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Abstract: The Aspect-First Hypothesis observes that children tend to associate the lexical semantics of predicates with grammatical aspect marking and tense, and children with SLI are known to have problems with tense. A theoretical question raised by these facts is whether the SLI difficulty with tense is limited to morpho-syntax, or whether it extends to the lexical semantics implicated in the Aspect-First phenomenon as well. In previous work, children with SLI have been less consistent than controls in their Aspect-First prototypical tense–aspect groupings. In the current project, we study the spontaneous production data of 38 five-year-old monolingual Spanish-speakers in Mexico, half of whom are diagnosed with SLI and half of whom are age-matched controls. We coded the spontaneous production of each child’s 20- to 30-minute language sample for tense, grammatical aspect and lexical aspect to determine: (1) whether each group followed Aspect-First prototypical tense–aspect groupings and (2) whether children in the SLI and TD groups were different from one another in their tense–aspect distributions. Children in both groups appeared to follow the Aspect-First prototypes, in contrast to comprehension findings. SLI children were not significantly different from TD children in their distribution of predicates, as a function of tense and lexical aspect, contra elicited production results from English. Results are discussed in terms of methodological and comprehension-production differences.

Keywords: Spanish, SLI, aspect first, prototypes, optional infinitives

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1 Introduction

The Aspect-First generalization observes that children tend to pair predicates with an inherent endpoint (telic predicates, in the Aktionsart terms of Vendler 1967) with past tense morphology and predicates that lack such an endpoint, including stative and activity predicates (atelic predicates), with present tense morphology. Another robust finding regarding tense is that, cross-linguistically, children diagnosed with specific language impairment (SLI) seem to lag behind typically developing (TD) age controls in expressive and receptive tests of verb tense, which is sometimes referred to as the Extended Optional Infinitive Stage (Rice et al. 1995). Given that both of these observations critically involve tense, researchers have asked whether children with SLI might differ from same-age controls with regards to the Aspect-First generalization due to their atypical use of tense. In so doing, these studies bring together two independent lines of research to deepen our understanding of the SLI deficit and possibly to tell us something about the Aspect-First phenomenon that might not have been visible in studies of typically developing children only. In fact, most of this work has shown that children with SLI do not behave as do TD children with respect to the Aspect-First phenomenon and researchers have attributed the problem to an array of different causes. In the present article, we examine the Aspect-First/Extended Optional Infinitive connection using spontaneous production data, which has not thus far been used to examine the question in children with SLI in any language. Because previous work has not examined the phenomenon through the lens of spontaneous production, our hope is that by considering our results together with receptive measures of the same phenomenon we may better understand how lexical aspect and impaired tense interact.

1.1 Aspect first

The Aspect-First observation captures the fact that children, as well as adults (Wagner 2009), tend to use predicates of particular lexical aspects, with verbs marked with the grammatical aspects and tense markings given in Table 1. The second row of Table 1 gives the lexical aspect of predicates, which we subsume, following convention, into telic predicates (those with an inherent endpoint) and atelic predicates (those that lack an inherent endpoint, including stative and activity predicates). The third row shows grammatical aspect interpretations and the fourth shows absolute tense values.

Table 1: Prototypical tense–aspect combinations.

	Group 1	Group 2
Lexical aspect	Telic	Atelic
Grammatical aspect	Perfective	Imperfective
Tense	Past	Present

The finding that children group verb tense, grammatical aspect, and lexical aspect in this way has been replicated across a wide variety of languages and language typologies: Antinucci and Miller (1976) for child Italian; Berman (1983) for child Hebrew; Bloom et al. (1980), Shirai and Andersen (1995) for child English; Bronckart and Sinclair (1973) for child French; Jackson-Maldonado and Maldonado (2001) for child Spanish; Li (1990) for child Mandarin; Shirai (1998) and Rispoli (1981) for child Japanese and Weist et al. (1984) for child Polish.

Wagner hypothesizes that these groupings, referred to as “prototypes” by Shirai and Andersen (1995), can be accounted for in terms of information processing. In particular, she suggests that it requires less information to determine whether a predicate refers to the past tense when it has an inherent endpoint (a telic predicate) than it does when the predicate lacks such an endpoint (e. g. an atelic predicate). This distinction is illustrated in examples (1)–(4). Notice that it is as clear that the event of table breaking is complete in the telic predicate in (1) as it is in (2), which adds extra information reinforcing its completeness with the phrase in parentheses. In contrast, it is unclear in the atelic predicate in (3) whether the kite is still being flown, and extra information is in fact required, as in the temporal phrase given in parentheses in (4), to establish that the event of kite flying is complete.

Telic

- (1) He broke the table.
- (2) He broke the table (in half).

Atelic

- (3) He flew a kite.
- (4) He flew a kite (until the string broke).

In this sense, as Wagner proposes, the fact that telic predicates are more susceptible to being perceived as complete predisposes them to expressing past tense events.

Indeed, a great deal of literature, mostly on younger pre-school aged children, has shown that children tend to stay within these prototypes, especially in production. In comprehension studies, however, it has been demonstrated that while children still tend to follow prototypes (e. g. Wagner 2001, 2002; Li and Bowerman 1998), they are also willing to allow non-prototypical groupings. Thus, the most radical interpretations of the Aspect-First observation (e. g. Antinucci and Miller 1976, Bronckart and Sinclair 1973), which hold that children in fact lack knowledge of tense and are limited to aspectual interpretations without temporal distinctions, have been disconfirmed. Comprehension studies demonstrating children's abilities to de-link tense, grammatical aspect and lexical aspect from prototypical groupings are found primarily in the work of Richard Weist on child Polish and English (especially Weist et al. 1991, 1997, 1999). While not critical for our research questions, among the proposals that argue that tense and lexical aspect are independent knowledge constructs in cognitive development, we will assume Wagner's (2009) view for concreteness.

1.2 Tense in child Spanish SLI

As we have seen, children show a predisposition to mark tense in a particular way on predicates that have a particular lexical character. Now let us turn to a population of children that appears to have general difficulty with expressive and receptive knowledge of the morphosyntax of tense. Children with SLI from a wide array of languages, including French (Jakubowicz and Roulet 2004), Dutch (Wexler et al. 2004), Hebrew (Leonard et al. 2000) and English (Rice et al. 1995; Leonard et al., 1997; Rice et al. 1998) pass through a protracted period during which they fail to mark tense on verbs in the adult-like way. This appears true of monolingual child Spanish as well, both when it is measured expressively (Grinstead et al. 2009, 2014) and when it is measured receptively (Grinstead et al. 2009). As illustrated in Table 2, child Spanish-speakers with SLI show significantly less knowledge of tense morphosyntax than controls. Further, child Spanish-speakers, with and without SLI, appear more adult-like when they are measured using spontaneous production than when they are measured with either elicited production or judgment tasks. Table 2 summarizes three studies of tense marking in monolingual Spanish-speaking children with SLI. The second row is from a grammaticality judgment task, the

Table 2: Cross-methodological comparison of mean correct tense scores and SLI/TD comparisons.

Method	Study	μ	Age	SLI	<i>n</i>	Age		<i>P</i>
						Controls	<i>n</i>	
Grammaticality Judgment	Grinstead et al. (2009) ^a	5;6	43 %	9	81 %	9	<0.001	
Elicited Production	Grinstead et al. (2009)	5;7	82 %	21	95 %	21	0.001	
Spontaneous Speech	Grinstead et al. (2014)	5;6	95 %	21	99 %	21	<0.001	

^aGrammaticality judgment scores are of bare stem forms only, though children’s judgments for morphological infinitives were similar. From Grinstead et al. 2014, Table 2, p. 63.).

third row from an elicited production task and the bottom row is from a spontaneous speech study. In all three studies, the SLI proportions of tense marking, given in the fourth column, are statistically lower than the proportions of the aged-matched typically developing children, given in the sixth column.

Note that in the fourth column of Table 2, the percentage correct for tense marking in the SLI sample rises as the methodology moves from being most controlled (by the experimenters) and receptive (grammaticality judgment) to being least controlled and expressive (spontaneous speech). The same is true in the sixth column, for typically developing age controls. This fact will become relevant in our discussion of methodological differences, below.

Most importantly, the results given in Table 2 imply that, as in other languages, child Spanish-speakers diagnosed with SLI are impaired in their knowledge of tense. Some sample tense errors from 4-year-old children with SLI, presented in (5) and (6), include the following plausibly nonfinite bare stem forms (from Grinstead et al. 2014: 53–54, examples 3 and 4):

- (5) *The investigator asks the child about what the children in the movie Shrek do.*

Investigator: Oye, y ¿qué hacen los bebés en la película?

Listen, what do the babies do in the movie?

Child: Baña tina.

bathe- (root + theme vowel) tub

Bathe tub.

- (6) *The investigator talks to the child about what the child has asked Santa Claus for.*

Investigator: Le hacen una carta a Santa Claus.

You write a letter to Santa Claus.

- Child: Y yo pide un carro de *Batman Inicia*.
 And I ask for (root + theme a car from *Batman Begins*
 vowel)
- Investigator: ¿Pediste un carro de *Batman Inicia* o lo vas a pedir apenas?
 You asked for a *Batman Begins* car or you are about to ask
 for it?

The difference between SLI and TD scores on an elicited production task of tense was clear enough that Grinstead et al. (2013) were able to identify child Spanish-speakers with SLI at 89% sensitivity and 89% specificity (near the conventional 90% criteria for good sensitivity and specificity, following Plante and Vance 1994), using a discriminant function analysis. We take this to be strong confirmation of the existence of an Extended Optional Infinitive Stage in monolingual child Spanish SLI. The data reported from production studies of Spanish-speaking children with SLI being raised in language contact situations with English (e. g. Bedore and Leonard 2001, 2002, 2005) and Catalan (Bosch and Serra 1997; Sanz-Torrent et al. 2008) appear to show similar results.

1.3 Prototypical tense–aspect grouping in SLI

Now we turn to the question of whether children with SLI, known to have difficulty with tense, distribute their tense marking on predicates as a function of lexical aspect, as do typically developing children. An early study related to this question, though not directly addressing prototypes is the work of Schulz et al. (2001). Schulz et al. (2001) show that German-speaking children with language impairment are less proficient than typically developing controls at responding to a Truth Value Judgment Task that uses the perfective past tense of the telic German verb *aufmachen* (to open) to characterize events of opening containers (boxes or suitcases). The event that the children judge is represented in the experiment by a sequence of two photos, which culminate with the second photo depicting either an open or a closed container. Language-impaired children in this study perform significantly more poorly than do the typically developing children at rejecting use of the telic verb in the past to characterize an event that was not completed. Rejecting this use of the telic verb also appears to have been more difficult for TD children and adults, consistent with Wagner's claims, than accepting the use of the telic verb in the past to characterize an event that was completed. In this sense, these results are consistent with the

pattern shown in Aspect-First studies (difficulty of using past tense verbs with predicates that lack an inherent end point).¹

More directly addressing the Aspect-First observation, Leonard et al., (2007) use an elicited production task to test whether 5-year-old English-speaking children with SLI show the prototypical distribution of lexical aspect and tense, in comparison to an age control group and a MLU-matched control group of younger children (mean age = 3;5). Results showed that while both TD control groups followed prototypical tense–aspect groupings, the children with SLI did not. In later work, using the comprehension task of Wagner (2001), Leonard and Deevy (2010) test a sample of 5-year-old children with SLI and control groups of TD children, to determine the degree to which they hew to prototypical tense–aspect combinations in comprehension. Results showed that children with SLI are generally worse with past tense than with the present, irrespective of the telicity of the event, while the TD children are least accurate when past actions are incomplete, following prototypical behavior. The authors conclude that child English-speakers with SLI are insensitive to event completion cues in the past tense, consistent with the conclusion that they do not follow prototypical lexical semantic-tense patterns.

Turning to Spanish, Grinstead et al. (2013) ask whether the well-known SLI tense deficit could cause problems for child Spanish-speakers with SLI at the level of temporal semantics, in the same way that it appears to in morphosyntax. To test this hypothesis, they use a comprehension experiment to examine whether 20 Spanish-speaking children diagnosed with SLI can match sentences with telic or atelic predicates representing completed or incomplete events that are depicted in pictures. The younger sample of typically-developing Spanish-speaking children ($n = 33$, mean age = 3;9) was significantly better at matching verbs marked with present progressive with pictures representing atelic situations than they were with telic situations, and they were also significantly better at matching verbs marked with past perfective with pictures representing telic situations than they were with atelic situations. Contrasting with the behavior of the TD children, the children with SLI did not show an asymmetry regarding matching past perfectives with telic situations more than with atelic situations. These results support the claim that child Spanish-speakers with SLI do not follow prototypes, in contrast with the TD children. This finding is consistent with the findings of the non-Spanish literature.

¹ Schulz et al.'s claim is not strictly about prototypes, but rather about whether children have an explicit representation of head-of-event, in the sense of Pustejovsky (1995), as part of their Event Structural Bootstrapping Hypothesis.

The results of Leonard et al. (2007), Leonard and Deevy (2010), Schulz et al. (2001) and Grinstead et al. (2013) all suggest that children with SLI, or the diagnostically less stringent LI (language impairment) of Schulz et al.'s studies, are different from TD children in their pairing of events with inherent end points with predicates bearing past perfective morphology. Given these findings from comprehension studies and an elicited production study, in our project we asked the same question using a different kind of data, namely, spontaneous production data. In unstructured spontaneous production, children may have greater control of the predicate-morphology pairings they use. To this end, we formulated the following research questions:

1. In spontaneous speech, do child Spanish-speaking children diagnosed with SLI follow tense–aspect prototypes?
2. In spontaneous speech, are child Spanish-speaking children diagnosed with SLI significantly less likely to match predicates and verb morphology in a prototypical way than are child Spanish-speakers in an age-matched, typically developing control group?

2 Methods

2.1 Participants

38 monolingual Spanish-speaking children in Mexico City provided spontaneous production samples in this study. A parent of each child signed US and Mexican institutional board-approved informed consent documents, allowing participation. 19 children were diagnosed with SLI by conventional criteria (Leonard 2014) and had a mean age of 67 months ($SD = 6.31$), with an age range of 58–82 months, and an average MLU, measured in words, of 2.9 ($SD = 0.70$). Only children with a nonverbal IQ score above 85, as measured by a Spanish translation of the WIPPSI (Weschler Preschool and Primary Scale of Intelligence), were included in the SLI sample. Children were also given ASHA protocol hearing screenings and were shown to have no problems. The parent report showed no history of otitis media with effusion or physical and/or social difficulties that might affect linguistic interaction. Neurological tests showed no signs of frank neurological damage and initial examination ruled out problems with oral structure and motor function. With respect to language, children took the locally normed Bateria de Evaluación de Lengua Española (BELE – Rangel et al. 1988). Of the BELE's 7 subtests, 2 are receptive language tests and 2 are expressive language tests. In order to be included in our SLI sample, children had to have a score of 1.25

standard deviations below the mean (6 or lower) on at least one receptive test (“Comprensión Gramatical” Grammatical Comprehension or “Adivinanzas” Riddles) and at least one expressive test (“Producción Dirigida” Elicited Production or “Definiciones” Definitions). Beyond conventional criteria, children were also identified as having SLI by the family history questionnaire of Restrepo (1998), which has been shown to have good to excellent sensitivity and specificity in identifying Spanish-speaking children with SLI. Finally, to ensure that children were not being misdiagnosed as SLI for articulatory reasons, they had to be able to repeat 24 nonce words that ended with the segments that represent tense and agreement in Spanish. They had to produce at least 4 out of 5 examples of each word type correctly to be included. The children in the age-matched, typically-developing group had a nearly identical mean age (66 months, $SD = 6.73$) with an age range of 55–79 months, and an average MLU, measured in words, of 5.4 ($SD = 1.9$). All had BELE scores that fell in the typically developing range for their ages and all met the rest of the criteria applied to the SLI children. The characteristics of each group are summarized in Table 3.

Table 3: SLI and TD sample characteristics.

Group	Age range	Age in months (SD)	MLUw (SD)	Number of utterances (SD)
SLI	58–82 months	67 (6.31)	2.9 (0.70)	103 (10.91)
TD	55–79 months	66 (6.73)	5.4 (1.9)	98 (16.46)

2.2 Procedures

All children were recorded producing roughly 20–35 minutes of spontaneous, mostly narrative, speech, usually about what they had done that same day, what kinds of games they played, who they played with or the plots of their favorite movies. The children in the SLI group provided samples in a clinical setting, while the children in the control group provided the sample in a preschool setting. In both cases, the researchers engaged the children in conversation. As the goal was to gather at least 100 utterances for purposes of calculating MLUw, the narrative was typically terminated once children appeared to have reached roughly 100 utterances.

2.3 Transcription reliability

Native speakers of Mexico City Spanish (the same dialect as the children) transcribed the video recordings of the children’s spontaneous speech. Before

transcribing, transcribers were normed on a set of common transcriptions. Each recording session was transcribed by a transcriber. Then, a second transcriber checked this transcription. Finally, a third transcriber of the same dialect re-transcribed 10% of half of the recordings in order to calculate reliability. Thus, the third transcriber re-transcribed 50–60 utterances from half of all the transcripts used in the study. Agreement between transcribers, calculated by word, ranged from 90–99% with a mean agreement percentage of 95.4%. The inter-rater reliability between the original transcriber and the third transcriber was calculated using Krippendorff's Alpha coefficients for interval data (Hayes and Krippendorff 2007). The range of the coefficients was 0.904–0.998, with a mean value of 0.974.

2.4 Coding

The relationship between the values for lexical aspect, grammatical aspect and tense that we have been discussing thus far in Spanish, logically allow for 12 possible combinations of the following factor values: tense – past/present, grammatical aspect – perfective/imperfective and lexical aspect – stative/activity/telic. Given the strong tendency of children and adults to produce utterances with linked tense and grammatical aspect (past with perfective and present with progressive), however, we will only report results for 8 combinations, collapsing tense and grammatical aspect (Table 4). These combinations are the most relevant to the prototype hypothesis of Shirai and Andersen (1995) and most similar to previous work on typically developing child Spanish (Jackson-Maldonado and Maldonado 2001) and tense and aspect in child SLI (e.g. Leonard et al. 2007).

Table 4: Tense and lexical aspect combinations reported.

Number	Tense	Lexical aspect
1	Past	Telic
2	Past	Activity
3	Past	Stative
4	Past	Stative + Activity (Atelic)
5	Present	Telic
6	Present	Activity
7	Present	Stative
8	Present	Stative + Activity (Atelic)

All verbs were coded for tense (past, present, future and nonfinite) and lexical aspect (telic, activity, stative). Two native speakers of Mexican Spanish were normed on a set of transcripts containing child Spanish spontaneous production data for tense, grammatical aspect and lexical aspect. Predicates were then coded for tense and lexical aspect. A third Spanish speaker served as a tie-breaker for disagreements between the two primary coders. Telic predicates were those with an inherent endpoint, as in (5) and (6). In (6) there are two predicates, the second of which is telic and underlined.

Telic Examples – Past and Imperfective

- (5) Me trajeron un juguete.
They (los reyes magos) brought me a toy.
- (6) No, pero me dijeron quien lo rompió hoy.
No, but they told me who broke it today.

Stative predicates were those that represented a state or result, as in (7) and (8).

Stative Examples – Present and Ongoing

- (7) Está descomponida.
It (a movie about Winnie the Pooh) is broken (overgeneralized irregular past participle – should be *descompuesta*).
No sirve.
It doesn't work.
- (8) Su pancita es verde.
Her little belly is green.

Activity predicates were predicates with no inherent endpoints, though they may have involved change, unlike states ((9)–(10)).

Activity Examples – Present and Habitual/Ongoing

- (9) Mm, a veces gasto el agua.
Um, sometimes I waste water [describing mischief she gets into].
- (10) y los otros hermanos jugamos con el jueguito de Sebastián.
and the other siblings (and I) play with Sebastian's game.

For tense coding, all grammatical aspectual variants were collapsed into single past, present and future categories, with past and present being the critical codes for the Aspect-First Hypothesis.

3 Results

We report group means calculated from proportions of statives, activities, telics and statives + activities (atelics), following Jackson-Maldonado and Maldonado (2001), for each child over the total number of verbs produced by the child. In this way, children who were more or less verbose were treated in the same way, and their proportions given equal weight across both samples. This is important because the children in the SLI sample tended to talk less in general than the TD children. TD children produced 1466 verbs and children in the SLI group produced 829 verbs. Mean proportions within each sample were then calculated for each lexical aspect and tense combination (Table 5). Because the data distributions were non-normal and variances were not equal, a non-parametric Friedman test was performed with telic, activity, stative and stative + activity as dependent variables and tense as the independent variable. It showed that there were differences ($n = 76$, chi-square = 313.131, $df = 5$, $p < 0.001$). To determine where these differences lay, Wilcoxon Signed Rank tests were performed between present and past scores for each lexical semantic category, producing the results given in the following table. Table 5 illustrates that the SLI and TD groups taken together treated the lexical semantic categories differently in the present than in the past tense.

Table 5: Proportions and standard deviations of lexical aspect categories in present and past tense – all children (TD and SLI).

	Past	Present	Z Score	<i>p</i>
Telic	0.20 (0.11)	0.13 (0.10)	-2.255	0.024
Activity	0.04 (0.03)	0.11 (0.08)	-4.039	<0.001
Stative	0.08 (0.08)	0.36 (0.16)	-5.156	<0.001
Stative + Activity	0.12 (0.09)	0.47 (0.16)	-5.152	<0.001

These results confirm that, for both groups taken together, statives and activities were produced more in the present than in the past (0.36 vs 0.08 and 0.11 vs 0.04, respectively) and that telics were produced more in the past than in the present (0.20 vs 0.13), as the Aspect-First Hypothesis would predict.

To determine whether children within the SLI group and children within TD group were following the prototypical groupings of the Aspect-First hypothesis, within each group, another Friedman test was performed on the mean proportions of past tense verbs out of all verbs, and on present tense verbs out of all verbs (Table 6). Results indicate significant differences in the type of predicate used by children with and without SLI. To determine where these differences lay, post-hoc Wilcoxon Signed Rank tests were performed.

Table 6: Friedman test (non-parametric Omnibus ANOVA) – with score as the dependent variable, group and lexical aspect as independent variables.

Tense	<i>N</i>	Chi-Square	df	<i>p</i>
Past	152	263.467	2	<0.001
Present	152	263.467	2	<0.001

In the past tense, as predicted by the Aspect-First Hypothesis, we found significantly greater use of telic predicates than activity predicates, greater use of telics than statives and greater use of telics than the combination of activity and stative predicates, within both SLI and TD groups, as illustrated in Table 7. The denominator for the proportions in Tables 7 and 8 is the total number of verb produced by each group (TD = 1466 verbs, SLI = 829 verbs).

Similarly, in the present tense, both groups of children used present tense verbs significantly more with stative predicates than with telic predicates, as the Aspect-First Hypothesis would predict. Within the atelic umbrella, however, activity predicates did not follow Aspect-First predictions for either group. TD children used present tense to express telic predicates significantly more than activity predicates, contra Aspect-First predictions, while children with SLI showed no difference in use between the predicate types. Collapsing activities and states makes the atelic category follow Aspect-First predictions, but the effect is clearly driven by statives.

Turning to between-group comparisons, we find no differences between the SLI and TD groups' productions of past and present verbs as a function of lexical semantics, as illustrated in Table 9.

Table 7: Proportion of past tense verbs over all verbs (TD = 1466 verbs, SLI = 829 verbs) and standard deviations, within-group “Aspect First” comparisons with telicity – Wilcoxon signed rank tests.

Group		Lexical aspect (Mean proportion of all predicates)	Z Score	Asymptotic significance
TD	Telic	Activity		
	0.20 (0.12)	0.04 (0.03)	-3.783	<0.001
		Stative		
		0.10 (0.08)	-3.432	0.001
SLI	Telic	Activity		
	0.20 (0.11)	0.04 (0.03)	-3.724	<0.001
		Stative		
		0.06 (0.08)	-3.549	<0.001
	Activity + Stative			
	0.14 (0.10)	-2.093	0.036	
	Activity + Stative			
	0.10 (0.08)	-3.114	0.002	

Table 8: Proportion of present tense verbs over all verbs (TD = 1466 verbs, SLI = 829 verbs) and standard deviations, within-group “Aspect First” comparisons with telicity – Wilcoxon signed rank tests.

Group		Lexical aspect (Mean Proportion of All Predicates)	Z Score	Asymptotic significance
TD	Telic	Activity		
	0.17 (0.10)	0.11 (0.09)	-2.178	0.029
		Stative		
		0.34 (0.18)	-2.938	0.003
SLI	Telic	Activity		
	0.15 (0.09)	0.11 (0.07)	-1.302	0.193
		Stative		
		0.37 (0.14)	-3.3376	0.001
	Activity + Stative			
	0.45 (0.19)	-3.549	<0.001	
	Activity + Stative			
	0.49 (0.13)	-3.724	<0.001	

Table 9: SLI vs. TD between-group comparisons of proportions (standard deviations in parentheses) – Wilcoxon signed rank tests.

Lexical aspect	Morphology	Z Score	TD Mean	SLI Mean	Asymptotic significance
Telic	Past	−0.161	0.20 (0.12)	0.20 (0.11)	0.872
	Present	−0.604	0.17 (0.10)	0.15 (0.09)	0.546
Activity	Past	−0.240	0.04 (0.03)	0.04 (0.03)	0.811
	Present	−0.501	0.11 (0.09)	0.11 (0.07)	0.616
Stative	Past	−1.690	0.10 (0.08)	0.06 (0.08)	0.091
	Present	−0.644	0.34 (0.18)	0.37 (0.14)	0.520
Activity + Stative	Past	−1.449	0.14 (0.10)	0.10 (0.08)	0.147
	Present	−0.604	0.45 (0.19)	0.49 (0.13)	0.546

4 Discussion

The results of coding spontaneous production data for tense and lexical aspect are that both typically developing and specific language-impaired children follow Aspect-First prototypes, with the exception that one of the two atelic predicate types (activities) in the present tense are not used more than telics. Taken as an atelic group, statives and activities, are used more than telics in the present because statives are used to such a large degree. Returning to our research questions, then, in answer to Question 1, children with SLI do indeed follow prototypical groupings of tense and lexical aspect in spontaneous production, in contrast to previous comprehension and elicited production studies in English, German and Spanish. In answer to Question 2, with respect to whether TD and SLI children differ from one another with regards to prototypical tense aspect groupings, the answer is that they do not.

What then are we to conclude, given the contradictory results of this study and previous research? There are no significant differences between the two groups in spontaneous production, but does this mean that previous cross-linguistic results showing differences in comprehension and elicited production studies are mistaken? This seems unlikely. Rather, perhaps there is something particular to the unstructured spontaneous production data collected here that promotes children appearing more typical than they do under more tightly controlled experimental conditions.

4.1 Priming

A possible explanation for children’s apparently typical behavior in our data could be that they are being primed by adult interlocutors in these sessions in a

way that they are not in either an elicited production experiment or a comprehension experiment. If adults tend to pair lexical aspect, grammatical aspect and tense in adult Spanish, as argued by Wagner (2009) for adult English, then it seems likely that a kind of priming for prototypically aligned predicates and morphology could result. Such priming should be absent when this pairing is most controlled, for example in a Truth Value Judgment Task, as in Schulz et al. (2001), or in a receptive, comprehension task such as Wagner's (2001) task, used by Leonard and Deevy (2010), or in Grinstead et al.'s (2013) task, and, in fact, it is on such measures that children with SLI produce significantly different linguistic behavior from that of controls. To be specific, if some non-trivial proportion of the SLI children's utterances reflects their repetition of expressions or entire predicates (including their tense and aspect morphology) that they hear from their adult interlocutors, then our spontaneous measures will not reflect their grammatical potentialities as much as they measure the actual productions to which they are exposed. Again, this is meaningful inasmuch as adults, following Wagner (2009), appear to be as susceptible to the Aspect-First prototypes as children, for information processing reasons, on her account.

4.2 Methodological differences

Note that in Table 2 we saw with respect to verb finiteness marking that both children with SLI and TD children appeared substantially more adult-like in spontaneous production than they did on either elicited production or receptive tasks. In our study, the Spanish-speaking children with SLI's pairing of tense and lexical semantics appear to be a recapitulation of this methodological distinction: while the comprehension results of Grinstead et al. (2013) showed these same child Spanish-speakers with SLI to not use Aspect-First prototypes, these spontaneous production results plant them firmly in the prototypical, Aspect-First side of tense–lexical semantics pairing. Thus, experimental methodology would seem to be an important factor in understanding the differences we have found.

In summary, our results add new methodological perspectives to the field by testing children with SLI for the Aspect-First phenomenon. While we have not demonstrated that priming is responsible for the SLI children's prototypical predicate-tense pairings, it seems at least plausible that our spontaneous production data allow for a more adult-like appearance, perhaps due to repetition of high-frequency expressions that mirror adult predicate-tense pairings. Further exploration of the interactions between the syntax and semantics of tense in children with specific language impairment will await future research.

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