Revealing Early Comprehension of Subject-Verb Agreement in Spanish

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1. Introduction

Previous research has revealed that, in at least some languages, children's comprehension of subject-verb (SV) agreement is delayed compared to production. For example, children acquiring Spanish and English have not been found to show comprehension of number agreement in the 3rd person until surprisingly late, around age 5 (Spanish: Pérez-Leroux, 2005; English: Johnson, de Villiers, & Seymour, 2005). However, children acquiring these languages are claimed to reliably *produce* SV agreement by age 2½ (Mueller Gathercole eb sti n o to, 1999; Montrul, 2004). Thus, the acquisition of SV agreement early in development appears to represent a striking reversal of the typical comprehension-production asymmetry (Fraser, Bellugi, & Brown, 1963).

In a recent series of studies, we have shown that comprehension of number SV agreement is not in fact universally late, but may depend on language-particular factors. Using identical methodology and visual stimuli, we found evidence of successful comprehension of agreement by French-learning children as young as 30 months, but failed to find such evidence in Spanish-learning children as old as 47 months (Legendre, Barrière, Goyet, & Nazzi, 2010; Barrière, Nazzi, Legendre, Goyet, & Kresh, 2010; Legendre, Culbertson, Zaroukian, Hsin, Barrière, & Nazzi, in press). The present study builds on this line of research on cross-linguistic differences in acquisition of agreement by investigating the role of a new task feature: the use of pseudo-words used in the verbal stimuli. Accordingly, we reassess the question of whether early comprehension of SV can be found in Spanish, testing Mexican Spanish-learning children aged 40 to 60 months.

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2. Previous results in French and Spanish

The methodological and stimulus details used in our previous studies (Legendre et al., 2010, in press; Barrière et al., 2011) differ in potentially important ways from previous research on comprehension of agreement (Johnson et al., 2005; Pérez-Leroux, 2005). In this section we review these differences, and discuss how they may have impacted our findings.

In our previous work on French SV number agreement, we sought to remove some characteristics of earlier studies that may have affected children's bility to succeed in the t s k even if the requisite grammatical representations were in place. In particular, two features of our studies differed from previous work. First, we used dynamic visual stimuli to increase the clarity of the scenes and potentially increase participant engagement. Relatedly, while both Johnson et al. (2005) and Pérez-Leroux (2005) had used displays contrasting a single agent with a pair of agents, which could be problematic if children have a general preference for looking at a display with more agents, we used two (potential) agents in each picture, as discussed further below. Second, we considered two semantic issues arising from the mapping between such scenes and the utterances that are meant to distinguish them (see Kouider, Halberda, Wood, & Carey, 2006 for additional discussion). A singul r utter n ce like "the duck swims in the pond" could in principle be interpreted as referring to either the singular display, or to *one* of the ducks in the plural display (distributive reading). A plural utterance like "the ducks swim in the pond" could be interpreted as referring to both displays, which together contain swimming ducks (collective reading). These interpretations could lead to apparent errors on both singular and plural trials. Following Kouider et al. (2006), we used two distinct unfamiliar objects for singular and plural visual displays in order to discourage such interpretations. That we were successful in doing so is suggested by the success of French-learning 30-month-olds in the task. Another advantage of using pseudo-noun labels is to obviate the need to control for children's knowledge of noun vocabulary.

These potentially more engaging visual stimuli and less ambiguous visual and verbal stimuli were used in the context of Inter-Modal Preferential Looking studies, as well as a pointing study, to test early comprehension of agreement in French. We found that children as young as 30 months showed successful comprehension in both tasks, as well as in a more challenging task using nonce verbs (Legendre et al., 2010; Barrière et al., 2011). This suggests that, insofar as the alternative distributive interpretation we highlighted above may have been a problem in previous studies, we may have ameliorated the issue with our use of pseudo-nouns. In Legendre et al. (in press), we then attempted to replicate this finding in Mexican Spanish-learning children. Despite the methodological differences, our results were nevertheless in line with Pérez-Leroux (2005): no evidence of successful comprehension was revealed in children ranging from 30 to 47 months. These results strongly suggest that even when holding visual-stimuli and other task properties constant, differences remain in the development of SV comprehension across French- and Spanish-speaking children. The primary hypothesis proposed by Legendre et al. (in press) to

explain this difference revolves around language-specific properties of the French and Spanish SV agreement systems —for example use of overt vs. null markers, and the salience of the overt markers.

Here, we build on these previous findings by examining another possible factor that may contribute to the Spanish-learning children's apparent failure to comprehend SV agreement in our task, namely the potential role of the pseudo-nouns in our stimuli. As explained above, we used these pseudo-nouns in order to discourage alternative interpretations of the mapping between the verbal stimulus and the displayed videos. However, there is reason to believe that including a pseudo-word may introduce an additional source of complexity in this task. The literature provides some evidence for a cost in processing nonwords (Berko, 1958; Riches, Faragher, & Conti-Ramsden, 2006; but see Barrière et al., in revision, for an example of lack of a lexicality effect). Inclusion of pseudo-words may thus have decreased the computational resources available to process the SV agreement markers. More concretely, pseudo-words may have acted as a distraction to children in the task if these pseudo-words were particularly salient in the context of an utterance otherwise comprised of real words; children may have construed them to be relevant to the task. If so, they may have been actively trying to map these pseudo-nouns onto the unknown objects in the scenes. If the Spanish SV number agreement morphology is relatively more difficult to acquire than the French one (as argued by Legendre et al., in press), any effect of the pseudo-nouns might be more detrimental for Spanish-learning children. In the present study, we test this hypothesis by presenting the results of two experiments manipulating use of pseudo-nouns. We compare comprehension of SV agreement when pseudo-nouns are used to label the unfamiliar objects (Experiment 1), and when the familiar word *objeto* "object" is used instead (Experiment 2).

2. Experiment 1
2.1 Method

Participants

Forty monolingual Mexican Spanish-speaking children were tested (mean age = 50 months; range: 38-64 months; 22 girls, 18 boys). The data of four additional children were not included in the analyses due to a side bias (always responding to the same side of the screen; N = 2) or to an object bias (repeatedly stating "I do not know which the 'pseudo-noun' is;" N = 2), an issue we return to in section 2.2.

Stimuli.

Visual stimuli. The visual stimuli were sixteen videos of eight different actions from Legendre et al. (2010); a sample still image is shown in Figure 1. In each video two boys appear, and for each action, either one boy performs the action alone while the other boy stands still beside him (singular video), or the two boys perform the action jointly (plural video). Different unfamiliar objects were used in the singular and plural conditions

of each action (a total of sixteen unfamiliar objects were used). Thus, the same action was performed on different objects by a single boy (singular video) versus two boys (plural video). All video sequences lasted 6 seconds.

Figure 1. Still image extracted from one video pair (left: singular action; right: plural action).

Verbal stimuli. Auditory stimuli consisted of short null subject sentences having a transitive verb + determiner + pseudonoun structure (e.g. *agarra el miso* '(he) catches the miso' vs. *agarran el miso* '(they) catch the miso). Null subject sentences, the dominant pattern for 3rd person referents in Spanish (Cameron, 1992), were used in order to provide only a single cue to number from the verb. Eight verbs, referring to the eight actions in the videos, were used: *amarrar* 'tie', *agarrar* 'c tch', *besar* 'kiss', *quitar* 'remove', *limpiar* 'wipe', *parar* 'stop', *llevar* 'carry', *sacar* 'take out'. These verbs were chosen because they are known by many children according to the Mexican Spanish CDI (Dale & Fenson, 1996), they follow the most regular pattern of Spanish verbal morphology (ending in *-ar*), and they can all be used transitively. The eight pseudo-nouns used were: *lipe, pliro, napo, duco, leto, miso, trude,* and *jaldo*.

Procedure and Apparatus

Each child was tested individually in a quiet space within their kindergarten. Children were seated in front of a touchscreen LCD 22" monitor (Planar PX2230MW). The touchscreen was connected to a laptop controlling the presentation of the visual stimuli. The experimenter was seated behind the child and next to the laptop.

First, the child was told that some images would appear on the screen and that she would be asked to touch one of the images. Each experimental session began with four training trials, consisting of two images of familiar objects (a house, a car, a cat, a dog, a book, a key, an apple or a leaf) presented on each side of the screen. After 12 seconds of visual presentation, the live experimenter said: *Viste la casa?, muéstrame con tu dedo la casa, dónde está la casa?* 'Did you see the house?, point where the house is, where is the house?'. When the child touched the image the color of the screen background changed from black to purple, indicating that the answer was registered. After the four training trials a video of two boys waving was presented (the same boys that appear in the test videos) while the experimenter said: "Now you will see videos of two boys doing different activities and I will ask you to point at one of them, watch them carefully!"

The test phase consisted of eight trials. Each trial started with one video presented in silence twice on the left side of the screen. After the first video disappeared, a second video appeared in silence on the right side of the screen; it was played twice and then disappeared. Both videos depicted the same action, with one video representing the 'singular' form of the action and the other representing the 'plural'. Then, both videos (plural and singular) were displayed simultaneously while the live experimenter said: *Viste? besan el duco, muéstrame con tu dedo en cuál imagen besan el duco, dónde besan el duco* 'Did you see? (they) kiss the duco, point where (they) kiss the duco, where (do they) kiss the duco?' As in the training phase, the color of the screen background changed when the child touched the image and a three-second-long eye-catching video (a dance performed by the two boys) was displayed on the side which played the *matching* video at test.

For half of the test trials, the speech stimulus, produced by the live experimenter, corresponded to the singular video, while it corresponded to the plural video for the other half of the trials. The side on which the matching video was presented was counterbalanced within participants.

2.2 Results and Discussion

The percentage of pointing towards matching videos was calculated for each child and means for the group (M_{Total} = 54.37%, SD = 15.90%; $M_{Singular}$ = 51.87%, SD = 27.96; M_{Plural} = 56.88%, SD = 18.76) are presented in Figure 2. The results showed a performance at chance level overall ($t(39)$ = 1.74, p = .09) and for the singular condition ($t(39)$ = .43, p = .67). Performance was significantly above chance for plural trials ($t(39)$ = 2.32, p = .03), though not if corrected for multiple comparisons.

Additionally, to explore the effect of age, the children were separated into two age groups: the younger group included children age 50 months or younger (N = 19; mean age = 43 months; range: 38-50 months; 12 girls, 7 boys) and the older group included children age 51 months or older (N = 21; mean age = 56 months; range: 51-64 months; 10 girls, 11 boys). The results showed an overall performance at chance level for both the younger (M_{Total} = 55.26%, SD = 17.34%; $t(18)$ = 1.32, p = .20) and the older group (M_{Total} = 53.57%, SD = 14.87%; $t(20)$ = 1.10, p = .28), with no change in performance with age ($t(38)$ = .33, p = .74).

The results of Experiment 1 reveal overall performance at chance level, and no effect of age. This replicates a general failure to find evidence of early comprehension of SV agreement in Spanish reported in previous work (Pérez-Leroux, 2005; Legendre et al., in press). In previous work we have highlighted differences in the agreement systems of French and Spanish which we argue could explain why child learners of the former succeed in this task while learners of the latter do not (Legendre et al., in press). Here, however, our goal was to simplify the task itself in order to potentially reveal comprehension in Spanish as early as possible. To do this, we explored the possibility suggested in section 1 that children may have had difficulties with the pseudo-nouns in the test sentences. If these pseudo-nouns (particularly in the context of known verbs) increased processing difficulty or distracted children from the otherwise unambiguous agreement

distinction, this could have negatively impacted their performance. This idea was supported by sever l children's comments to the experimenter during the task. Two children in particular said repeatedly, *No sé cuál es el 'miso'* 'I do not know which the 'pseudo-noun' is'. This suggests that during the test phase children may have been actively trying to discover which object the pseudo-noun in the sentence corresponded to, thus reducing attention to the SV agreement. Experiment 2 tested this possibility, replacing the pseudo-nouns with the word *objeto* 'object'. This manipulation retains the benefit of discouraging the alternative semantic interpretations (since the objects are still distinct in the two scenes) without presenting children with unknown words in the test utterances.
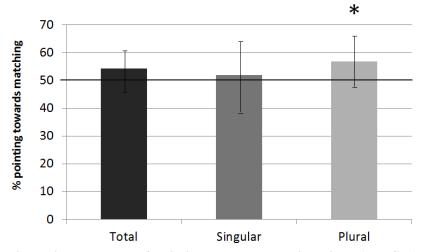

Figure 2. Percentage of pointing towards matching video (and SEs) across all trials, on singular trials only, and on plural trials only.

3. Experiment 2
3.1 Method

Participants

Forty monolingual Mexican Spanish-speaking children were tested (mean age = 51 months; range: 41-61 months; 16 girls, 24 boys). The data of two additional children were not included in the analyses due to a side bias (children always responded to the same side of the screen; N = 2).

Stimuli

Visual stimuli. The visual stimuli were the same as in Experiment 1.
Verbal stimuli. Auditory stimuli consisted of short null subject sentences having a transitive verb + determiner + "object" (e.g. *agarra el objeto* '(he) catches the object' vs. *agarran el objeto* '(they) catch the object'). The eight verbs, referring to the eight actions in the videos, were the same as in Experiment 1.

<u>Procedure and Apparatus</u>

The apparatus and procedure used were identical to those used in Experiment 1.

3.2 Results and Discussion

Percentage of pointing towards matching videos was calculated for each child and means for the group (M_{Total} = 61.56%, SD = 18.64%; $M_{Singular}$ = 60.63%, SD = 23.94; M_{Plural} = 62.50%, SD = 24.67) are presented in Figure 3. The results revealed above change performance overall (t(39) = 3.92, p < .001), and this extended to both singular (t(39) = 2.81, p = .007) and plural trials (t(39) = 3.20, p = .002).

As in Experiment 1, we separated the children into two age groups: the younger group included children age 50 months or younger (N = 20; mean age = 43 months; range: 41-50 months; 9 girls, 11 boys) and the older group included children age 51 months or older (N = 20; mean age = 58 months; range: 51-61 months; 7 girls, 13 boys). The results showed a performance above chance level for both age groups (younger: M_{Total} = 62.50%, SD = 19.45%; t(19)= 2.87, p = .009; older group: M_{Total} = 60.62%, SD = 18.26%; t(19) = 2.60, p = .01), with no change in performance with age (t(38)= .09, p = .93).
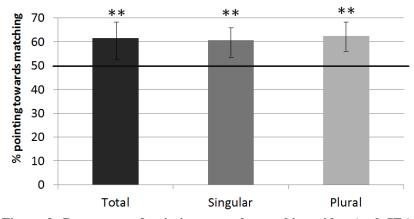

Figure 3. Percentage of pointing towards matching video (and SEs) across all trials, on singular trials only, and on plural trials only.

The results of Experiment 2 show above-chance performance for both singular and plural conditions, and for both age groups tested. Our findings therefore suggest that when task demands are lowered by removing pseudo-noun objects from the test sentences, Spanish-learning children exhibit clear evidence of SV agreement comprehension as early as 40 months. To our knowledge, this result represents the earliest evidence of SV comprehension in Spanish.

4. General Discussion

In Experiment 1, we used unfamiliar objects with pseudo-noun labels, in order to discourage alternative semantic interpretations of the test sentences (Kouider et al., 2006). In this experiment, 40-to-60-month-old Mexican Spanish-learning children did *not* display an ability to correctly match sentences to videos on the basis of SV number agreement information. In Experiment 2, we removed those pseudo-nouns and replaced them with the familiar word 'object'. With this relatively minor change, another group of 40-to-60-month-old Spanish-learning children showed clear evidence of comprehension. This was true across both singular and plural trials, and for both the younger and older children tested. We have thus established for the first time that Spanish-learning children's system of SV number agreement is sufficiently in place by 40-to-50 months of age to allow for successful comprehension in an experimental setting.

Our results suggest that there is a way to minimize the possibility of collective/distributive interpretations of verbal stimuli in these kinds of tasks, without introducing the additional complexity of pseudo-words. More generally, this highlights the potential of task-specific properties to mask children's underlying grammatical competence, and the need for experiments to systematically investigate these factors. Nevertheless, while we have been able to reveal earlier comprehension of agreement in Spanish than has been previously found, differences relative to French remain. In particular, the earliest age at which successful comprehension was revealed in French was 30 months, and clearly the use of pseudo-nouns in the test sentences did not mask the effect with this population. To better understand this collective set of results, we first discuss why the presence of pseudo-words may have had an effect on performance in our task. We then return to differences between Spanish and French, both specific to our experiment and concerning the SV agreement systems of these languages.

We have suggested in general terms that pseudo-words may result in a relatively higher processing load for children. However, at least some children in Experiment 1 expressed their confusion with respect to the pseudo-nouns more concretely. It appears that some children in our task, at least at this age, were actively attempting to match the verbal stimuli with the pictures by determining the referent of the pseudo-noun rather than by using the SV agreement markers. There are several potential reasons they may have been doing so. First, our practice trials involved presenting two objects and asking children to match a noun label to one of these objects. This may have led children to expect that objects would be relevant for the task (rather than number of actors). Second, the two videos presented for any given test trial were purposefully similar in our stimuli: there were always two boys present, and the action was necessarily the same. This may have made the unfamiliar objects particularly salient to the children.

These explanations for why children may have had trouble with pseudo-nouns in our task may be generally at play in our experiments on Spanish and French. Nevertheless, they did not appear to hinder French-learning children's performance to the same extent—in fact French-learning children showed evidence of successful comprehension at an even earlier

age. There are differences in the position of the relevant agreement markers with respect to the pseudo-nouns in French and Spanish (given that the French marker is prefixal, and the Spanish marker suffixal) that may have caused the pseudo-forms to be more disruptive in Spanish. However, there are two main factors that we believe are more likely to be responsible for the differences found across these languages: the age difference between the populations tested, and the relatively reliability or salience of the French markers.

The Spanish-learning children in our studies have consistently been older than the French-learning children. The age of our Spanish-learning participants was in keeping with earlier work, the goal being to establish successful comprehension first at older ages, and then to look at younger children. The age difference between these two populations, though, is highly likely to be correlated with differences in the size of the lexicon. While toddlers very often encounter unknown words, older children have a larger lexicon, and thus are likely to encounter unknown words less frequently. For these older children, the presence of pseudo-words might have therefore been more likely to draw their attention, obscuring any sensitivity to the morphological differences. Future work will test this possibility by testing younger Spanish learners in a task using pseudo-words (or alternatively, testing older French learners with the pseudo-noun and with the familiar word 'objet').

Differences in the agreement systems of French and Spanish may also contribute to children's b ility to show successful comprehension in the face of task demands. The French paradigm tested was the system of prefixal agreement (Legendre et al., 2010; Culbertson, 2010), which has distinct forms in the 3rd person when followed by vowel-initial verbs. As illustrated in (1), these forms are arguably both overt, /l/ in the singular and /z/ in the plural.

(1) a. il-embrasse (***i.lãm.bras***) "he kisses"
    b. ils-attachent (***i(l).zãm.bras***) "they kiss"

By contrast Spanish has overt marking on the plural form only (*besa* vs. *besa**n***). This may mean that the paradigm in Spanish is not as transparent to children as the French one: the null third-person singular form in Spanish could be taken as a default form, devoid of any particular mapping to number (cf. Pratt & Grinstead, 2007). There are also several ways in which the French system tested may be more salient to learners compared to the Spanish system. The first way concerns a process of morphological segmentation which learners must acquire along with this agreement system: liaison. As shown above in (1), the coda consonants on the French agreement morphemes *il* and *ils* undergo obligatory resyllabification when they precede a vowel-initial verb. Children must therefore undo liaison by removing the /l/ or /z/ in order to access the lexical item. There is reason to believe that French-learning children can undo liaison by 20 to 24 months of age (Babineau & Shi, 2011; Nazzi & Polka, submitted), and a number of previous studies have found that liaison does not negatively affect processing of French lexical items by adults (Wauquier-Gravelines, 1996;

Spinelli, McQueen & Cutler, 2003; Nguyen, Wauquier-Gravelines, Lancia & Tuller, 2007). One possibility then, is that this process actually serves to bring attention to the morphological status of the marker early in acquisition.

The difference in perceptual salience between the French and Spanish agreement markers may be exacerbated by the particular stimuli used in our experiments. The French marker appears word- and sentence-initially in our stimuli (*Il embrasse le naf*), while the Spanish marker appears word-finally and sentence-medially (*Besan el duco*). Since this kind of difference in position h s been shown to f fect children's b ility to perceive English agreement (Sundara, Demuth & Kuhl, 2011), it seems reasonable to expect that it might have contributed to relatively poorer performance across our Spanish studies compared to French.

Finally, we have argued that perhaps the most convincing difference between French and Spanish is the high cue reliability of the French agreement marker /z/ (see also Barrière et al., 2011). Few nouns and verbs begin with /z/ in French, making the /z/ a reliable marker of agreement (via liaison) with vowel-initial plural nouns and verbs. Thus when French children hear /z/ they can consistently map the noun or verb onto a plural representation. This is not possible with the Spanish plural suffix /n/, which is a somewhat common final phoneme in singular nouns and adjectives. Thus when we ultimately compare French- and Spanish-learning children on identical paradigms and at identical age ranges, there is still reason to predict performance disparities. The mapping from /z/ to 'plur l' in French is almost deterministic regardless of any other available cue; the mapping from /n/ to 'plur l' in p n ish needs to t ke into c count the c tegory of the lexical item (verb vs. noun) in order to be correct. The increased complexity of the Spanish mapping relative to the French one may mean that it is both harder to learn and harder to apply in on-line comprehension in Spanish.

5. Conclusion

We have presented new evidence of early comprehension of SV agreement in Mexican Spanish, pushing the age of earliest comprehension down by nearly a year relative to previous studies. By manipulating properties of the verbal stimulus (use of a known word instead of pseudo-nouns), we showed that children as young as 40-to-50 months can comprehend the third person SV number agreement paradigm in Spanish, a finding that opens up the possibility of testing even younger children. We believe that, along several dimensions, these studies help to shed light on a surprising case in which production has been argued to precede comprehension. First, by looking across multiple languages while holding methodology and visual stimuli constant, we can narrow the field of possible explanations for apparent late comprehension. Second, our work points to the importance of task-specific features which might mask evidence of earlier comprehension success. These features include the possible role of perceptual salience in the stimulus materials, the potential for alternative interpretations of visual displays, and finally, the impact of pseudo-words on children's t sk expect tio ns and processing.

6. Acknowledgments

7. References

Babineau, Mireille & Shi, Rushen (2011). Processing of French liaisons in toddlers. In Nick Davis, Kate Mesh, & Hyunsuk Sung (Eds.), *BUCLD 35 Proceedings* (pp. 25-37). Cascadilla Press, Somerville, MA.

Barrière, Isabelle, Nazzi, Thierry, Legendre, Géraldine, Goyet, Louise, & Kresh, Sarah (2011). The representation of subject-verb agreement in French-learning toddlers: New evidence from the comprehension of an infrequent pattern of pseudoverbs. In Nick Davis, Kate Mesh, & Hyunsuk Sung (Eds.), *BUCLD 35 Proceedings* (pp. 38-48). Cascadilla Press, Somerville, MA.

Barrière, Isabelle, Goyet, Louise, Kresh, Sarah, Legendre, Géraldine, & Nazzi, Thierry (in revision). Productive morphosyntax in French-learning toddler.

Berko, Jean (1958). The Child's Learning of English Morphology. *Word*, 14, 150-177.

Cameron, Richard (1992). *Pronominal and null subject variation in Spanish: Constraints, dialects, and functional compensation*. Ph.D. dissertation, University of Pennsylvania.

Culbertson, Jennifer (2010). Convergent evidence for categorial change in French: From subject clitic to agreement marker. *Language*, 86, 85-132.

Dale, Philip S., & Fenson, Larry (1996). Lexical development norms for young children. *Behavioral Research Methods, Instruments, and Computers, 28*, 125-127.

Fraser, Colin, Bellugi, Ursula, & Brown, Roger (1963). Control of grammar in imitation, comprehension, and production. *Journal of verbal learning and verbal behavior, 2*, 121–135.

Johnson, Valerie E., de Villiers, Jill G., & Seymour, Harry N. (2005). Agreement without understanding? The case of third person singular /s/. *First Language, 25*, 317-317.

Kouider, Sid, Halberda, Justin, Wood, Justin, & Carey, Susan (2006). Acquisition of English Number Marking: the Singular-Plural Distinction. *Language Learning and Development, 2*, 1–25.

Legendre, Géraldine, Barrière, Isabelle, Goyet, Louise, & Nazzi, Thierry (2010). Comprehension of infrequent subject-verb agreement forms: Evidence from French-learning children. *Child Development, 81*, 1859–1875.

Legendre, Géraldine, Culbertson, Jennifer, Zaroukian, Erin, Hsin, Lisa, Barrière, Isabelle, Nzzi Thierry (in press). Is children's comprehension of subject-verb agreement universally late? Comparative evidence from French, English, and Spanish. Lingua. doi:10.1016/j.lingua.2013.05.004

Montrul, Silvia A. (2004). *The Acquisition of Spanish: Morphosyntactic development in monolingual and bilingual L1 acquisition and adult L2 acquisition*. John Benjamins Publishing Co., Amsterdam/Philadelphia.

Mueller Gathercole, Virginia C., ᴇeb sti n Eugeni , & Soto, Pilar (1999). The early acquisition of Spanish verbal morphology: across-the-board or piecemeal knowledge? *International Journal of Bilingualism*, *3*, 133–182.

Nazzi, Thierry & Polka, Linda (submitted). The consonant bias in word learning is not determined by position within the word: Evidence from vowel-initial words.

Nguyen, Noël, Wauquier-Gravelines, Sophie, Lancia, Leonardo, & Tuller, Betty (2007). Detection of liaison consonants in speech processing in French: Experimental data and theoretical implications. In Prieto, Pilar, Mascaró, Joan, and Solé, Maria-Josep (Eds.), *Segmental and Prosodic Issues in Romance Phonology*, (pp. 3–23). Philadelphia, PA: John Benjamins.

Pérez-Leroux, Ana-Teresa (2005). Number problems in children. In: Gurski, Claire (Ed.), *Proceedings of the 2005 Canadian Linguistic Association Annual Conference*.

Pratt, Amy, & Grinstead, John (2007). Optional infinitives in child Spanish. In *Proceedings of the 2nd Conference on Generative Approaches to Language Acquisition North America (GALANA)* (pp. 351–362).

Riches, Nick G., Faragher, Brian, & Conti-Ramsden, Gina (2006). Verb schema use and input dependence in 5-year-old children with Specific Language Impairment (SLI). *International Journal of Language & Communication Disorders 41*, 117-135.

Spinelli, Elsa, McQueen, James M., & Cutler, Anne (2003). Processing resyllabified words in French. *Journal of Memory and Language, 48*, 233–254.

Sundara, Megha, Demuth, Katherine, & Kuhl, Patricia (2011). Sentence-position effects on children's perception and production of English 3rd person singular – s. *Journal of Speech, Language, and Hearing Research*, 54, 55-71.

Wauquier-Gravelines, Sophie (1996). *Organisation phonologique et traitement de la parole continue: Contraintes prosodiques et phonologique de l'accès lexical.* Ph.D. dissertation, Université Paris Diderot, France.