The Representation of Subject-Verb Agreement in French-learning Toddlers: New Evidence from the Comprehension of an Infrequent Pattern of Pseudoverbs

Isabelle Barrière[1], Louise Goyet[2], Thierry Nazzi[2], Sarah Kresh[3] and Géraldine Legendre[4]

1. Introduction
1.1 Theoretical background

The aim of the present study is to contribute to the current debate on the nature of toddlers' morphosyntactic representations, which is characterized by two contrasting approaches. According to Lexicalist or Constructivist hypotheses (e.g. Tomasello, 2001), toddlers are sensitive to structures they hear frequently and the first constructions they produce are combinations of specific linguistic items including combinations of specific words and inflections based on this frequent input. In contrast, according to Generativist theories (e.g. Hyams, 2008), the input plays a relatively minor role. Instead, toddlers are thought to have the capacities to form abstract morphosyntactic representations that apply to whole lexical categories (e.g. Noun, Verb, etc.) and not only to familiar words. These abstract representations do not systematically reflect frequencies of specific combinations in the input, but rather underpin productive principles, such as subject-verb agreement. While these hypotheses were first tested on the basis of speech production samples, more recently evidence from the investigations of young children's receptive skills has been accumulating.

The present study tests one of the issues on the basis of which the constructivist and generative positions mentioned above differ, namely whether and to what extent toddlers' morphosyntactic representations reflect productive principles. In order to do so, we tested French-learning toddlers on their comprehension of an infrequent verbal number agreement pattern, using pseudoverbs rather than known verbs.

1.2 Production of verbal number agreement by French-speaking children

Most studies on the acquisition of morphosyntax rely on analyses of speech production samples and French is no exception (e.g. Bassano & Mendes Maillochon, 1994; De Cat, 2007; Hamman et al., 1996; Legendre et al., 2002; Pierce, 1992). The most important results that emerge from these studies are summarized below.

The acquisition of subject-verb agreement by French-learning children is of particular interest because it involves at least two types of subjects that have been assigned a distinct status ever since the first generative analyses of French morphosyntax (Kayne, 1975).

Type 1: Determiner Phrases (DPs), either determiner + NP or strong pronouns (*moi*-1st Person Singula*r*, *toi*-2nd Person Singular, etc.)
Type 2: Subject clitics (or prosodically weak pronouns): *je*-1st Person Singular*, tu*-2nd Person Singular*, il*-3rd Person Singular Masculine *elle*-3rd Person Singular Feminine*, on*-1st Person Plural Colloquial, *nous*-1st Person Plural*, vous*-2nd Person Plural and 2nd Person Singular Formal*, ils*-3rd Person Plural Masculine, *elles*-3rd Person Plural Feminine.

The study of the status of clitic subjects in adult morphosyntactic representations has given rise to two distinct theoretical positions. Some accounts assign to subject clitics the status of pronominal elements that occupy the canonical position of subjects and receive a thematic role (e.g. Cardinaletti & Stark, 1999; Côté, 2001; De Cat, 2005, 2007; Kayne, 1975; Rizzzi, 1986). According to other accounts, they are best analyzed as agreement markers (e.g. Auger, 1994; Culbertson, 2010; Jacubowicz & Rigaut, 1997; Kaiser, 1994; Legendre et al., 2002; Legendre et al., 2010a, Miller, 1992; Pierce, 1992; Roberge, 2006; Zribi-Hertz, 1994).

Studies on the acquisition of French suggest that this distinction emerges early in development. Around 2 years of age, in young French-learning children's early word combinations, subjects that consist of Determiner Phrases containing Nouns or Strong Pronouns do not have the same distribution as in the adult grammar: they are produced with both non-finite and finite verbs and they appear before and after the verb (Legendre et al., 2010a, Pierce, 1992), resulting in a significant number of non-adult-like utterances (e.g. DP subjects with non-finite verbs and/or in post-verbal position). Subject clitics are found to emerge relatively early around 2 years of age. In contrast to Type 1 subjects, when they are used they are used correctly (Hamman et al., 1996; Legendre et al., 2002; Pierce, 1992). For instance, analyses of spontaneous (Hamman et al., 1996; Legendre et al., 2002) and elicited (Jakubowicz & Rigaut, 1997) speech production have revealed that they are very rarely produced (less than 2%) with non-finite verbs. The positions that they occupy in child speech also reflect

those that they occupy in the adult grammar: they systematically precede the verb and they are placed before the object and reflexive clitics.

Until about 30 months of age, French-speaking children erroneously produce non-finite verbs with no subject or with DP subjects and correctly produce finite verbs with DPs and with subject clitics (Hamman, 1996; Kaiser, 1994; Legendre et al., 2002; Legendre et al., 2010a; Pierce, 1992). Thus at this age their production of subject-verb agreement is not stable although their production of subject clitics tends to be systematically associated with finite forms, which is not the case for their production of DP subjects, including strong pronouns (Hamman, 1996; Kaiser, 1994; Legendre et al., 2002; Legendre et al., 2010a, Pierce, 1992). However the analysis of speech production provides only limited insights into children's morphosyntactic representations. A more comprehensive view of the linguistic principles that children entertain can be gained by examining their receptive language skills, including their comprehension.

The present study focuses on the comprehension of 3rd person subject clitics by young children at an age when these items are still not systematically produced but are typically used as a default pronoun (Legendre et al., 2002).

1.3. Comprehension of verbal number agreement marked on real verbs by French-learning toddlers

The comprehension of subject-verb agreement in French-learning toddlers was investigated by Legendre et al (2007, 2010b). The focus was on constructions/structures that involve a single agreement cue/marker and the use of subject clitics. An innovative aspect of this study compared to those conducted on English (Johnson, De Villiers & Seymour, 2005) and Spanish (Childers, 2001, Pérez-Leroux, 2005) was the fact that dynamic video stimuli were used, rather than still images, in both an Intermodal Preferential Looking Paradigm task and a pointing task.

Like other Romance languages, French has a system of conjugations that determine the morphophonological properties of verb inflection. Ninety percent of French verbs belong to the first conjugation corresponding to the *-er* ending in the infinitive. Orally, 3rd person singular and plural forms are homophonous although their orthographic forms differ, e.g. *il danse* /i(l)dãs/ 'he dances' versus *ils dansent* /i(l)dãs/ 'they dance'. The paradigm to which these verbs belong is regular and productive. One morphophonological subgroup of these verbs, those that start with a vowel, is distinguished in the singular and the plural when subject clitics are used. Ten verbs were selected on the basis of being among the earliest known verbs with the target morphophonological properties (Legendre et al., 2010 b)): *accrocher* 'hang'*, allumer* 'switch on'*, apporter* 'bring'*, arrêter* 'stop'*, attacher* 'catch'*, embrasser* 'kiss'*, enlever* 'take off'*, essuyer* 'wipe' and *ouvrir* 'open'. Although all these verbs have the same endings in the third person singular and plural, when they are used with subject clitics, the obligatory 'liaison' between the clitic and the verb—a phonological phenomenon resulting in one single agreement cue through resyllabification—

gives rise to a phonological contrast: *il embrasse* /i.**l**ãbras/ (singular) 'he kisses' versus *ils embrassent* /i(l).**z**ãbras/ (plural) 'they kiss'. The verbal stimuli in the study by Legendre et al. (2010b) contained a clitic subject in the third person singular or plural, the verb and a Determiner Phrase (determiner *le*/Masculine Definite and a pseudonoun). The same verbal and visual stimuli were used in the IPLP and pointing tasks. IPLP data were obtained from 24- and 30-month-old monolingual French-speaking children. Thirty-month-olds, but not 24-month-olds, were found to look significantly longer at the matching visual stimuli in both the singular and plural conditions. A pointing task involving the use of the same visual and verbal stimuli was administered to another group of 30-month-olds. These children pointed significantly more often to the matching video, in both the singular and the plural conditions, confirming the robustness of the results obtained on the IPLP task.

It is important to note that in both experiments, the participants were only tested on verbs with which they were familiar prior to the experiment: parents were required to complete French Communicative Development Inventories (henceforth CDI) (an adaptation of Kern, 2003) that included both comprehension and production (including of the specific verbs used in the verbal stimuli) and/or asked about the specific verbs in the tasks. The stimuli were selected according to the children's familiarity with the specific verbs and the participants were not tested on verbs they neither understood nor produced.

Thus this study provides evidence that 30-month-old French-speaking children are able to pay attention to a single agreement cue when they are familiar with the verb—both its form and its meaning. However, this study did not enable us to determine whether prior knowledge of the verb is required in order to understand the agreement cue.

Further, a detailed quantitative analysis of the input conducted on five CHILDES corpora revealed that the constructions (with subject clitics) involving the specific third person singular and plural forms of the verbs with a single cue (the liaison) used in the stimuli are infrequent (less than 3% of the input) and that in all corpora these constructions are more frequent in the singular than in the plural. These findings provide relatively weak evidence that the 30-month-olds' equal performance in the singular and plural on the comprehension tasks involving familiar verbs are not the outcome of frequent exposure to the constructions used in the verbal stimuli, nor of familiarity with specific lexical items. Further evidence is provided here from testing children in the same age group on unfamiliar verbs.

2. Comprehension of verbal number marked on pseudoverbs
2.1 Introduction
The present study takes a step beyond that of Legendre et al. (2010b) by testing 30-month-olds' comprehension of the same constructions used in the Legendre et al. (2010b) study (Subject Clitic—Verb—DP/Det *le*+ Pseudonoun, e.g., *il embrasse le douk* 'he kisses the douk'), but this time pseudoverbs were used.

Since Berko's (1958) seminal study, the use of pseudowords has been considered the most robust way to test children's abilities to generalize. While Berko (1958) focused on the production of English morphology, numerous studies using this technique have been conducted on different languages (e.g.. see Levy 1987, for Hebrew and Dalalakis, 1996, for Greek, among others). More recently, this technique has also been successfully employed to test toddlers' receptive language skills, including their abilities to assign lexical categories to novel words (e.g. Waxman, et al., 2009, for English; Nazzi & Gopnik, 2001, and Venezanio, Parisse & Delacour, 2010, for French), their representation of Argument Structure (Naigles, 1990, Gropen, 2000, Barriere & Lorch, 2006), their mapping between the order of constituents and thematic role assignment (e.g. Naigles, 1990, Gropen, 2000, Barriere & Lorch, 2006), and their understanding of function words and morphological markers including singular and plural noun markers (Kouider et al., 2006) and third person singular and plural subject-verb agreement markers in English (Soderstrom et al., 2007). The present study adopted this research strategy to test the comprehension of verbal number agreement marked on pseudoverbs that exhibit the same morphophonological characteristics as the verbal stimuli used in Legendre et al (2010b).

2.2 Method

Participants included 24 monolingual French-speaking 30-month-olds (13 males, 11 females; M = 30 months, 7 days; range: 29 months, 8 days to 30 months, 30 days). An additional twelve 30-month-olds were tested but excluded for not contributing data to all conditions (3) or for not pointing (9). Children were all tested in Paris, and came from diverse socio-economic backgrounds.

Figure 1: Still images from the videos used for unfamiliar action (singular version on the left and plural version on the right)

Two 8-year-old boys recruited for this purpose were filmed performing one of eight simple unfamiliar actions on unfamiliar objects. The unfamiliar actions were chosen so that they could not be described by a verb likely to be known by 30-month-olds, and the unfamiliar objects were chosen so that 30-month-olds

would not have a name for them. For each action, either one boy performed the action alone while the other boy was standing immobile next to the first boy (singular video), or the two boys performed the action together and simultaneously (plural video). Figure 1 shows characteristic still images from the actual videos used for one unfamiliar action. For each action, different unfamiliar objects were used in the singular and plural conditions (a total of 16 unfamiliar objects were used). Thus, the same action was performed on different objects by the single boy (singular video) versus the two boys (plural video). All video sequences lasted 6 seconds.

These pseudoverbs were created as transitive and belonging to the dominant or first conjugation class, like most real verbs used in Legendre et al. (2010b). They followed phonological characteristics of real French verbs, in order to have properties similar to those used in Legendre et al. (2010b), including number of syllables and endings exhibited by real French verbs. They were all vowel-initial, with phonologically identical third person singular and third person plural forms, number agreement being signaled only by 'liaison' between the subject clitic and the verb, as in the stimuli involving real verbs used by Legendre et al. (2010b).

The verbs were embedded in short sentences consisting of the third person subject pronoun in either singular (*il* 'he') or plural (*ils* 'they') form, the verb, and a DP (determiner *le* "the" + noun). Pseudonouns rather than real nouns were used as direct objects of the transitive verbs to refer to the unfamiliar objects, for the same reason as with real verbs in Legendre et al. (2010b) and to allow direct comparison with the results using real verbs obtained by Legendre et al. (2010b). We used sixteen different pseudonouns, which all had a Consonant-Vowel-Consonant structure (e.g., /gef/).

Each child was tested individually in a soundproof booth for about ten minutes, using a pointing task. Children sat on a parent's lap during the whole session. The parent, wearing dark glasses rendered opaque by covering the inside of the lenses, was blind to the video stimuli. The (female) experimenter sat to the immediate right of the child. When pronouncing the target utterance, the experimenter was careful not to look at the child or the screens; rather she stared at the central light between the two screens so as not to influence the child's pointing.

The session started with up to four training trials intended to set up the pointing game. The structure of the trials was the same for the training and test trials. The child's attention was first centered by flashing a central light located between the two presentation screens (the child facing the whole display). Once the child looked at the central light, a pair of pictures of bright, easily recognizable objects was shown in silence for 6 seconds. Then the screens turned black and the experimenter named one of the two objects and asked the child to point to it (e.g., *Tu as vu la pomme? Montre-moi avec ton doigt où elle se trouve la pomme, montre-moi la pomme.* "Did you see the apple? Show me with your finger where the apple is, show me the apple"). The two images immediately reappeared on their respective screens for six seconds. The child's

task was to point to the matching screen. If the child didn't point during the first seconds, the experimenter repeated the invitation once to give the child another chance at responding, and then, regardless of response, moved onto the next trial. Each trial ended with a 3-second-long eye-catching video displayed on the matching screen, following Legendre et al. (2010b).

Each child was then presented with eight trials of pseudoverbs. The 6-second-long singular/plural versions of the actions were presented simultaneously, once in silence and then once following the experimenter's request (e.g., *Tu as vu?* **Ils arrouvent** *le mic*, *montre-moi avec ton doigt où* **ils arrouvent** *le mic*, *montre moi où* **ils arrouvent** le mic "Did you see? They are arrouving the mic, show me with your finger where they arrouving the mic, show me where they are arrouving the mic").

For each child, the target was the singular action four times and the plural action the other four times (in random order). The order of presentation of the different unfamiliar actions/pseudoverbs was randomized by the experimenter, and the side of the matching video was counterbalanced within participants for each condition (singular/plural).

Coding of children's pointing was done online by the experimenter and the sessions were also videotaped using a digital video camera placed between the two screens. Each trial was coded as correct (score = 1) or incorrect (score = 0). A response was coded as correct only if the child clearly and decisively pointed to one screen. Any hesitant, double pointing or refusal to point resulted in the elimination of the corresponding trials. Overall, children clearly pointed on 6.96 out of 8 trials. The data were first coded online, then entirely recoded offline for 14 children by an assistant not familiar with the study and blind to the conditions of each trial. Inter-rater reliability was 90%.

2.3 Result

The results are presented in Figure 2. Overall, children pointed at the matching video 61.21 % ($SD = 16.37$) of the time, which is significantly above the 50% chance level ($t(23) = 3.35$; $p = .003$, 2-tailed). There was no significant difference between the singular and plural conditions, $t(23) = 1.86$, $p = .07$, 2-tailed, although children tended to have better performance for plural trials ($M = 67.71$ %, $SD = 24.37$, above chance level, $t(23) = 3.56$, $p = .002$, 2-tailed) than for singular trials ($M = 55.56$ %, $SD = 21.93$, at chance level, $t(23) = 1.24$, $p = .23$, 2-tailed).

This result reveals that French-speaking 30-month-olds are able to pay attention to a single verbal number agreement cue marked on a pseudoverb and to match it to the appropriate number of agents of an action. This provides evidence of a productive principle in French-speaking toddlers' morphosyntactic representations that enables them to generalize their understanding of number agreement involving two adjacent elements and expressed through liaison to novel/unfamiliar verbs.
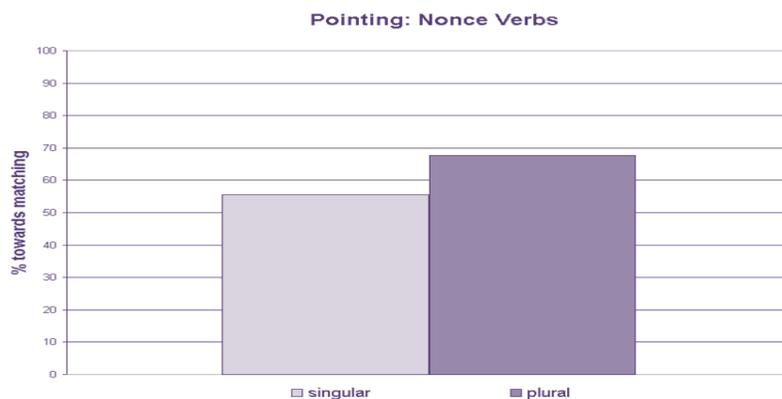
Pointing: Nonce Verbs

Figure 2: Percentage of correct responses in the pointing task with pseudoverbs.

2.4 Discussion

The results of the study by Legendre et al. (2010b) suggested that French learning 30-month-olds' performance on comprehension tasks that tested verbal number agreement was not the outcome of learning frequent constructions. However, given that in Legendre et al. (2010b), only verbs that were familiar to the participants were used in the stimuli, it was unclear whether the knowledge of verbs- their forms and their meaning- was required in order to pay attention and demonstrate understanding of verbal number agreement marking. The results of the present study demonstrate that 30-month-olds do not need to be familiar with the specific verbs used in the stimuli in order to demonstrate understanding of the agreement cue.

One of the surprising aspects of the results of Legendre et al. (2010b) pertained to the asymmetry in the frequencies of singular and plural constructions identified in the input and the fact that this asymmetry did not seem to have an impact on the results of the comprehension tasks: 30-month-olds were found to perform equally well in the singular and plural conditions. This similarity in performance in the singular and plural conditions is replicated in the pseudoverb condition. As mentioned above a trend was found towards better performance in the plural condition. Although constructions that exhibit plural subject-verb agreement are less frequent in the input, including those with verbs that start with a vowel, it is possible that the liaison plural consonant *-z-* is more systematically associated with plural subject-verb agreement than the liaison consonant ***-l-*** is with singular subject agreement. A detailed quantitative analysis of corpora would enable us to determine whether this factor may account for the trend observed in the results obtained on the pseudoverbs.

The next issue to be addressed is whether and to what extent our results provide evidence of a productive mechanism that underpins subject-verb agreement in toddlers' grammar. The results so far provide evidence of 30-month-olds' understanding of subject-verb agreement in the context of: a) the use of pseudoverbs that start with a vowel and that exhibit morphophonological characteristics of existing French verbs; b) adjacent elements; c) a contrast between 3rd person singular and plural number. On the basis of the results presented here it is impossible to determine whether the productive principle applied in our task would extend to: a) the use of pseudoverbs that express agreement contrasts through suffixes, i.e. the second conjugation class in French (e.g. *il finit* /ilfini/ singular 'he finishes' versus *ils finissent* /ilfinis/ plural 'they finish') and/or irregular French verbs (e.g. *il fait*/ilfe/ singular 'he does/makes' versus ils font /ilfõ / plural 'they do/make'); b) syntactic dependencies that involve non-adjacent elements; c) contrasts between different persons, not only numbers. A follow- up study is currently planned to address the first limitation mentioned above to investigate 30-month-olds' understanding of suffixes that mark subject-verb agreement.

Despite the limitations mentioned above, the results of our study are more compatible with hypotheses based on the generative approach that assign to toddlers the abilities to generalize morphosyntactic principles to unfamiliar lexical items than with those that emerge from the constructivist approach and propose that children's early linguistic representations are tied to specific and familiar lexical items not underpinned by productive principles.

References

Barrière, I. & Lorch, M. P (2006) On the acquisition of ambiguous valency-marking morphemes: insights from the acquisition of French SE. V. Torrens & Escobar, L. (ed.) *The acquisition of Syntax in Romance Languages*. Amsterdams: John Benjamins. 23-49.

Bassano, D., & Mendes-Maillochon, I. (1994). Early grammatical and prosodic marking of utterance modality in French: A longitudinal study. *Journal of Child Language,* 21, 649-75.

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

Cardinaletti, Anna, and Michael Starke. 1999. The typology of structural deficiency: A case study of the three classes of pronouns. *Clitics in the Languages of Europe*, ed. by H. van Riemsdijk. York, NY: Mouton de Gruyter. 145-234.

Childers, J., Fernandez A.M., Echols, C., & Tomasello, M. (2001). Experimental investigations of children's understanding and use of verb morphology: Spanish- and English-speaking 2 ½ and 3-year-old children. In M. Almgen, A., Bareña, M.J. Ezeizabarrena, I. Idiazabal, & B. MacWhinney (Eds.), *Research on language acquisition. Proceedings of the International Association for the Study of Child Language*. Somerville, MA : Cascadilla Press. 104-127.

Côté, M-H. (2001). On the status of subject clitics in Child French. In M. Almgren et al. (eds), *Research on child language acquisition*. Somerville: Cascadilla Press, 1314-1330.

Culbertson, J. (2010). Convergent evidence for categorial change in French : From subject clitic to agreement marker. *Language* 86:1, 85-132.

Dalalakis, J. (1996) *Developmental Language Impairment : Evidence from Greek and Its implications for Morphological Representations*. PhD Thesis, McGill University.

De Cat, C. (2007) *French Dislocations : Interpretation, Syntax, Acquisition*. Oxford : OUP (Oxford Studies in Theoretical Linguistics 17).

Ferdinand, A. (1996). *The development of functional categories : The acquisition of the subject in French*. Ph. D Thesis. Dordrecht: IcG Printing.

Hamann, C., Rizzi, L., & Frauenfelder, U. (1996). The acquisition of subject and object clitics in French. In H. Clahsen (Ed.), *Generative perspectives on language acquisition*. Amsterdam: John Benjamins. 309-334.

Kaiser, G. (1994). More About INFL-ection and Agreement: The Acquisition of Clitic Pronouns in French. In Meisel, J. (ed.), *Bilingual First Language Acquisition: French and German Grammatical Development*. Amsterdam: John Benjamins. 131-159.

Kayne, R. (1975). *French Syntax: the Transformational Cycle*. Cambridge, MA : MIT.

Gropen, J. (2000) Methods for studying the Production of Argument Structure in Children and Adults. In L.Menn & N. Bernstein Ratner (2000) *Methods for studying language production*. Mahwah, New Jersey: Lawrence Erlbaum. 69-94.

Hyams, N. (2008). The acquisition of inflection: A parameter-setting approach. *Language Acquisition*, 15: 192-209.

Jakubowicz, C. & Rigaut, C. (1997). L'acquisition des clitiques nominatifs en français. In A. Zribi-Hertz (Ed.), *Les pronoms : morphologie, syntaxe et typologie*. Saint-Denis : Presses Universitaires de Vincennes. 57-99.

Johnson, V.A, de Villiers, J.G., & Seymour, H.N. (2005). Agreement without understanding? The case of third person singular /s/. *First Language, 25,* 317-317.

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

Legendre, G., Vainikka, A., Hagstrom P., and Todorova, M. (2002). Partial constraint ordering in Child French Syntax. *Language Acquisition* 10(3), 189-227.

Legendre, G., Culbertson, J., Barrière, I. , Nazzi, T. & Goyet, L. (2010a) Experimental and empirical evidence for the status and acquisition of subject clitics and agreement marking in adult and child Spoken French. In V. Torrens, L. Escobar, A. Gavarro, & J. Gutierrez (Eds.) *Movements and Clitics: Adult and Child Grammar*. Newcastle : Cambridge Scholars Publishing. 333-360.

Legendre, G., Barrière, I., Goyet, L. & Nazzi, T. (2010b) Comprehension of infrequent subject-verb agreement forms: Evidence from French-learning children. *Child Development*, 81 (6): 1859-1875.

Levy, Y. (1987) The Wug technique revisited. *Cognitive Development*, Vol 2 (1), 71-87.

Naigles, L. (1990) Children use syntax to learn verb meaning. *Journal of Child Language*, 17, 357-374.

Nazzi, T. & Gopnik, A. (2001). Linguistic and cognitive abilities in infancy: When does language become a tool for categorization? *Cognition, 80*(3), B22-B20.

Pérez-Leroux, A-T. (2005). Number problems in children. In C. Gurski (Ed.), *Proceedings of the 2005 Canadian Linguistic Association Annual Conference* (12 pages). Available on-line at http://ling.uwo.ca/publications/CLA-ACL/CLA-ACL2005.htm.

Pierce, A. (1992) *Language acquisition and syntactic theory: a comparative analysis of French and English child grammars.* Dordrecht: Kluwer.

In Davis, N., Mesh, K. & Sung, H. (eds) (2011) *Proceedings of Boston University Language Development conference* 35: 38-48.

Soderstrom, M. White, K.S., Conwell, E., & Morgan, J.L. (2007). Receptive grammatical knowledge of familiar content words and inflection in 16-month-olds. *Infancy*, *12*, 1-29.

Tomasello, M. (2001). First steps towards a usage-based theory of language acquisition. *Cognitive Linguistics, 11* (Vols. 1-2), 61-82.

Waxman, S.R., Lidz, J.L., Braun, I.E. & Lavin, T. (2009) Twenty four month old infants'interpretation of novel verbs and nouns in dynamic scenes. *Cognitive Psychology*, 59, 67-95.