

Nouns and verbs in vocabulary acquisition of Italian children*

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Abstract

The vocabulary development of 24 Italian children aged between 16 and 18 months at the beginning of the study has been longitudinally monitored on a monthly basis using the Italian version of the MacArthur Communicative Development Inventory drawn up by their mothers.

This study analyzes data from children for whom two sampling stages were available; the first corresponding to a vocabulary size as close as possible to 200 words (mean: 217, range: 167-281), the second to a vocabulary size ranging from 400 to 650 words (mean: 518, range: 416-648).

The children's vocabulary composition was analyzed by calculating, for each sampling stage, the percentage of common nouns, verbs and closed class words. The increase in percentage points of the various lexical items between the first and second sampling stages was also analyzed.

Data confirmed the predominance of nouns over verbs and closed class words at both sampling stages, while verbs and closed class words had a higher percentage increase than nouns.

The results did not give any evidence of a relation between the style of acquisition based on the acquisition of nouns and a faster vocabulary growth.

INTRODUCTION

Over the last twenty years, the issue of early vocabulary composition has inspired many studies, which attempted to verify, in a cross-linguistic perspective, the hypothesis that there is an initial predominance of nouns over verbs and other lexical items. The first theoretical explanations regarding the particular facility of acquisition of nouns in comparison with other lexical items were proposed by Gentner (1982), who suggested that early predominance of nouns is universal and language-independent because perceptual and semantic factors favor nouns over verbs in the process of language acquisition. In fact, while nouns often refer to concrete objects, and have hierarchically organized semantic structures, verbs refer to actions and events, and have more complex organizing principles. Hence concepts coded by verbs could be identified less easily than those coded by nouns.

According to Markman (1989), the fact that nouns are acquired earlier than other lexical forms could also be due to children's innate tendency to assume that a new word refers to the whole object, and not to any of its parts, or to actions or changes of state that involve the object. In a more linguistically oriented perspective, Maratsos (1991) proposed that the core of the noun category involves semantic properties, while the core of the verb category lies in its shared morphological properties (i.e. tense or negation markers). This asymmetry is reflected in acquisition: for nouns, initial analysis is centered on its semantic core (i.e. concrete object reference), while for verbs, the semantic core (i.e. action) has less weight in its acquisition of this item; so children acquire verbs as members of a category that share certain morphological features. An alternative approach has been recently proposed by Gillette, Gleitman, Gleitman, & Lederer (1999): while information from an extra-linguistic context is sufficient to identify nouns correctly (noun – object matching), additional information is necessary for the identification of verbs, i.e. the analysis of the extra-linguistic context in which the verb is used (sentence – action matching). This hypothesis has been tested successfully with a human simulation of “cross-situational observative vocabulary learning”.

Empirical studies initially conducted in English, and in more recent years also in other languages, have produced controversial results. The largest study performed on English acquiring children by Bates, Marchman, Thal, Fenson, Dale, Reznick, Reilly, & Hartung (1994), analyzed the MacArthur Communicative Development Inventory (CDI, Fenson, Dale, Reznick, Thal, Bates, Hartung, Pethick, & Reilly, 1993), drawn up by the parents of 1,803 English-speaking children aged between 0.8 and 2.6 years and with a vocabulary size between 50 and 600 words. Data confirmed that nouns were largely predominant and comprised approximately 55% of the lexicon of children with vocabularies between 100 and 200 words, while predicates comprised less than 15%. An earlier acquisition of nouns with respect to verbs has been found also in children acquiring Spanish (Jackson-Maldonado, Thal, Marchman, Bates, & Gutierrez-Clellen, 1993), Hebrew (Maitel, Dromi, Sagi, & Bornstein, 2000), Finnish (Lyytinen, Lari, Lausvaara, & Poikkeus, 1994), German (Kauschke & Hofmeister, 2002), and French (Bassano, 2000; Poulin-Dubois, Grahman, & Sippola, 1995).

However, evidence contrary to the predominance of nouns in early vocabulary acquisition has also been found. Choi & Gopnik (1995) studied linguistic communication development of 9 Korean-speaking children longitudinally, from 14 to 24 months of age, analyzing spontaneous production and data deriving from interviews with parents. Results showed that 6 of the 7 subjects showed an earlier spurt for verbs spurt. When the vocabulary reached 50 words in size, there were 31% more verbs than observed in children acquiring English, in spite of the fact that nouns were more frequent on a percentage basis. Tardif (1996), when analyzing spontaneous speech in ten 22 month-old Mandarin-speaking children, found that they produced more verbs than nouns, even considering type as opposed to token. However, when a more general classification of nouns (including proper names) and verbs (including copulas and auxiliaries verbs) was analyzed verb predominance disappeared, leaving a balanced bias between the two grammatical classes.

Recently Tardif, Gelman & Xu (1999) compared the proportions of nouns and verbs in the early vocabularies of 24 English- and 24 Mandarin-speaking toddlers. Their subjects were matched

for age (20 months) but they had different vocabulary sizes: the Mandarin children had a word mean of 316, while the English children had a word mean of 160. Across all measures, the Mandarin-speaking children were found to have relatively fewer nouns and more verbs than the English-speaking children. However, context played an important role in the proportions of nouns found in the children's vocabularies and the Authors concluded that a "noun bias" in language-acquiring toddlers depends on a variety of factors, including the methods by which their vocabularies are sampled and the context in which observation occurs.

The comparison of data from various studies is problematic not only because of the different methods of data collection used (parents' diaries, questionnaires, samples of spontaneous speech) but also because frequently the vocabulary composition analysis has been made at different vocabulary sizes or, as in some cases, the vocabulary size is not specified at all. The predominance of verbs found by Tardif et al. (1999) in the vocabulary of Mandarin-speaking children, for example, could be due to their larger vocabulary size in comparison with that of the English-speaking children in the study. In a recent study, Kauschke & Hofmeister (2002) reported that verbs begin to appear at 1;3 years of age, increasing in proportion until they constitute the largest percentage at 3;0 years of age, but they did not report the children's vocabulary sizes at the various sampling points. Another case in point is Bassano's study (2000), in which vocabulary composition was analyzed only in relation to age, and not vocabulary size.

Another possibility is that early predominance of nouns over verbs depends on a scarce consideration of individual differences. Gopnik & Choi (1995) observed that nouns could be less predominant than may appear at a first analysis. Many investigators pointed to significant individual differences in early language in this regard; there is evidence that some children use significantly fewer names than nominal children (Nelson, 1973). There is also reason to believe that nominal children may be overrepresented in the literature, possibly due to the difficulty of correctly evaluating children's speech when characterized by a non-referential style, frequently constituted by frozen or formulaic phrases. From a methodological point of view, nominal children are highly

likely to be first-borns, and to be from relatively middle-class backgrounds, which is usually overrepresented in the studies on language acquisition.

The predominance of nouns or verbs in a particular language could also be due to pragmatic differences in the input: English-speaking children may learn nouns earlier because they are both pragmatically and syntactically salient in the input. As shown by Tardif, Shatz, & Naigles (1997), English mother-to-child-directed speech emphasizes nouns over verbs, whereas Mandarin-speaking caregivers emphasize verbs over nouns. Specifically, English caregiver-to-child speech tends to emphasize nouns by placing them in the utterance-final position, asking questions about objects and with fewer morphological markings on them. On the other hand, Mandarin tends to emphasize verbs by producing them more frequently than nouns, placing them in the utterance-final position and with fewer morphological marking on them. Choi & Gopnik (1995), in a cross-linguistic study of caregivers' input in English and Korean, showed that Korean mothers provide more action verbs but fewer object nouns than American mothers; also, Korean mothers engage in activity-oriented discourse significantly more often than their American counterparts.

Data from children acquiring the Italian language can be particularly useful for the debate on the relative predominance of nouns over verbs in the study of early vocabulary acquisition and the factors influencing the sequence of acquisition. As Caselli, Bates, Casadio, Fenson, Fenson, & Sanderl (1995) observed, Italian and English differ in certain characteristics: while in English the Subject-Verb-Object sequence is quite rigidly preserved, deviations from SVO are common in Italian speech, and subject, verb and object may appear in any order. Moreover, Italian (like Spanish, and Chinese) is a pro-drop or null-subject language, where subjects are only mentioned if they are being introduced for the first time or special emphasis is required. In English full pronouns are used in all sentence positions; Italian distinguishes between phonologically strong full pronouns and phonologically weak clitic pronouns. Clitic object pronouns must occur immediately before the verb in a declarative or interrogative form, forming an SOV or an (S)OV structure (when the subject is omitted), as in SOV languages such as Korean. Finally, English verbs carry a relatively

small number of agreement contrasts compared with other languages: for example, the English present indicative conjugation contains only one contrast, compared with six in Italian, one for each number and person.

Studies of the speech characteristics of Italian mothers when communicating with their children showed controversial results. Tardif et al. (1997), examining various measures such as type and token frequency, utterance position and morphological variation of nouns and verbs, considered Italian to be less focused on nouns than English but more than Mandarin; Camaioni & Longobardi (2001) only partially confirmed Tardif et al.'s results, evidencing an "equivocal" input, but concluding that Italian input is *verb oriented*, as opposed to showing a *balanced bias*.

Studies conducted on the vocabulary composition of Italian-speaking children reported similar results to those obtained from English speaking children. Caselli et al. (1995) analyzed vocabulary composition of 659 English-speaking children and 195 Italian-speaking children, from 8 to 16 months of age, using the MacArthur CDI. Results showed that, with a vocabulary of 50 words, children produced more social words (onomatopoeic, routines and proper names) than nouns and predicates; however, when their vocabulary reached a size comprised between 50 and 100 words, common nouns predominate (at 54% for English speakers and 46% for Italian speakers), while verbs were very rare (7% and 5% respectively). These results were confirmed by a subsequent study by Caselli, Casadio & Bates (1999) in which the vocabulary composition of 1001 English-speaking and 386 Italian-speaking was investigated. In this study predicates reached about 10% when the vocabulary size was comprised of 500 to 600 words.

D'Odorico, Carubbi, Salerni, & Calvo (2001), using a longitudinal approach to study the vocabulary development of 42 Italian-speaking children found that even though nouns were the dominant category (49% at the 100-word stage and 58% at the 200-word stage), predicates showed a significantly higher rate of growth than nouns in the passage from 100 to 200 words. Therefore, though the Authors confirmed a precocious acquisition of nouns with respect to predicates, the latter increased more rapidly in Italian-speaking children than English-speaking children; moreover,

significant individual differences came to light: some children acquired more nouns, others more predicates and closed class words.

The aim of the present study is to examine the composition of productive vocabulary up to a stage of vocabulary development which was not reached by D'Odorico et al. (2001) which observed vocabulary acquisition only up to the 200-word stage. This study will provide longitudinal information about the subsequent period of vocabulary growth (from 200 to 500 words) during which, presumably, verbs become more relevant. In order to be able to address more directly the question of the early bias towards nouns or as opposite to the early acquisition of verbs, we used in this study a pure verb category, rather than the predicate category (as in D'Odorico et al., 2001; Caselli et al., 1995; Caselli et al., 1999), which includes also adjectives. Furthermore, this choice will allow a more direct cross cultural comparison with results by Tardif et al. (1999) and Choi & Gopnik (1995). Nouns and verbs acquisition was also compared with that of closed class words, which comprises adverbs, pronouns, interrogatives, prepositions, articles, conjunctions. Our "closed class words" is larger than the class of "grammatical function words" analyzed, for example, by D'Odorico et al. (2001) and Caselli et al. (1995), but in this way we would be able to compare the development of inflected (nouns and verbs) versus uninflected words.

The creation of groups was privileged on the basis of vocabulary size rather than on the basis of age, because, as Pine & Lieven (1990) observed, age-dependent cross-sectional measures, if used to investigate style differences, could confuse true differences with variations in the developmental level, which is not controlled. Moreover, considering the age at which children reach the different vocabulary sizes, the relationships between qualitative and quantitative aspects of vocabulary development should be verified. Some studies based on age comparison evidenced a significant advantage in vocabulary growth for children who adopt a referential approach to language (Bates, Bretherton, & Snyder, 1988); others (Bates et al., 1994) showed that this advantage disappears when the comparison is made at a fixed vocabulary size. In this regard, Fasolo & D'Odorico (2002) found that late talkers differ from average talkers in the percentage of common

nouns acquired at the 50- and 100-word vocabulary size, which is significantly lower in children characterized by slow vocabulary development.

Finally, the longitudinal design permits verification of the stability of individual differences in the propensity to acquire common nouns, verbs or closed class words.

METHOD

Participants

Twenty-four Italian children (12 males and 12 females), aged between 16 and 18 months at the beginning of the study, were selected from a large sample (N=104; 54 males and 50 females) for early identification of language delay. Their families, recruited from local birth records, had agreed to participate with their children in a longitudinal study of language development. Only the children for whom we had two pre-selected vocabulary development sampling points were included in this study. The first sampling point corresponds to a vocabulary size as close as possible to 200 words (mean: 217, range: 167-281), the second to a vocabulary size ranging from 400 to 650 words (mean: 518, range: 416-648). No children included in this study exhibited a delayed vocabulary development, in so far the mean age at which they reached the 200-word vocabulary size was 22;09 (range 17;28-28;00). All children, therefore, were above the 10th percentile, according to Italian normative data (Caselli & Casadio, 1995). The second sampling point was reached by children at a mean age of 26;10 (range 20;07-32;13)¹.

The children and their families were all resident in the north of Italy. This sample comprised 12 first-borns, 11 second-borns and 1 third-born. Twelve mothers had 18 years of education, corresponding to graduate school, 10 mothers had 13 years of education corresponding to high school and 2 mothers had 8 years of education, corresponding to elementary and junior school. Data on vocabulary composition at 100- and 200-word vocabulary size for 5 of the children has already been included in D'Odorico et al.'s research (2001).

Complete demographic information of the children is given in Appendix.

Procedure

The vocabulary development was evaluated through the monthly mothers' input on the Italian version of the MacArthur Communicative Development Inventory (Primo Vocabolario del Bambino - PVB; Caselli & Casadio, 1995) until the children reached a vocabulary of about 400 words.

The Italian version of MacArthur Communicative Development Inventory is modeled as closely as possible on the English version in terms of overall format, number and type of lexical categories and number of items. The PVB Infant form ("Gesti e Parole", corresponding to the "Words and Gestures" of CDI) consists of a vocabulary list of 408 words, for which both comprehension and production is assessed, and a section (Azioni e Gesti) in which nonverbal communicative and representational skills are assessed. The Italian Toddler form ("Parole e Frasi", corresponding to the "Words and Sentences" form of the CDI) contains a vocabulary production checklist of 670 words and another two sections designed to assess morphological and syntactical production. The first form of the PVB ("Gesti e Parole") was used up to the month in which a vocabulary size of 50 words or more was reached. Thereafter the "Parole e Frasi" form was used.

Measures of children vocabulary composition and growth

For each sampling point we calculated a) the percentage of common nouns, including names of animals, vehicles, toys, food and drink, clothing, body parts, furniture and rooms, small household objects, places to go; b) the percentage of verbs; c) the percentage of closed class words, which include adverbs, pronouns, interrogatives, prepositions, articles, conjunction.

In order to allow comparison with data from Bates et al. (1994) we calculated also the number of opportunities ("saturation index") that are afforded by the checklist within each category, i.e. what percentage of common nouns (out of 334 possible items, 49.5% of the total checklist),

verbs (out of 103 possible items, 15.7% of the total checklist) and closed class words (out of 104 possible items, 15.5% of the total checklist) were reported at the two sampling point.

The growth rate of vocabulary was calculated evaluating the number of words that children acquire per day during the interval from the first to the second sampling point² Vocabulary growth within each category was calculated using the procedure described by Bates et al. (1994) and D'Odorico et al. (2001)³.

RESULTS

The percentages of nouns, verbs and closed class words at the two sampling point were analyzed by a repeated measures ANOVA, considering both Vocabulary size (2) and Word-type (3) as within-subject variables. We obtained a significant effect for Vocabulary size ($F(1,23)=33.59$; $p<.001$), for Word-type ($F(2,46)=907,19$; $p<.001$) and for the interaction between the two variables ($F(2,46)= 45,18$; $p<.001$). As a supplement to p values, we calculated also the confidence intervals (CI) for marginal means (at a value of 99%) and utilized them as a guide to interpretation of results (Masson & Loftus, 2003)⁴. Using the decision rule stated by Tryon (2001), we considered statistically different two means if the two confidence intervals associated with the means do not overlap.

Our results show that even at a higher developmental level than those previously investigated (Caselli et al., 1995; Caselli et al., 1999; D'Odorico et al. 2001), nouns are the most frequent lexical category for Italian children: more than 50% of their vocabulary is constituted by common nouns at both the vocabulary size levels considered (see Table 1).

Insert about here Table 1

Insert about here Figure 1

The percentages of verbs at both sampling point it is not statistically different from those of closed class words, because the higher limit of interval confidence of verbs at T1 is included in the CI calculated for closed class words (at T2 it is the lower limit of CI of verbs which is included in the CI calculated for closed class verbs). Moreover, while the percentage of nouns does not increase significantly from the first to the second sampling point, the percentage of verbs and closed class words do. It is interesting to note that percentages of nouns and closed class words at a vocabulary size of about 200 words is quite identical to that obtained by D'Odorico et al. (2001) for the same stage of vocabulary development, while the percentages of verbs (6.05%) is quite lower than the larger category of predicate (13.54%) analyzed in that study.

Predominance of nouns is also confirmed by the analysis of the opportunities that are afforded by the checklist (i.e. our “saturation index”) by a repeated measures ANOVA, considering both Vocabulary size (2) and Word-type (3) as within-subject variables. We obtained a significant effect for Vocabulary size ($F(1,23)=559.29$; $p<.001$), for Word-type ($F(2,46)=49.05$; $p<.001$) and for the interaction between the two variables ($F(2,46)= 19.07$; $p<.001$). Results (see Figure 2) show that the saturation index at T1 is significantly higher for nouns than for verbs and closed class words, while it does not differ between verbs and closed class words. At the second sampling point, however, saturation index for verbs and nouns is no more different (even if closed class words have a lower saturation index than nouns and verbs). This analysis show that the larger proportion of nouns with respect to verbs and closed class was not a by-product of the fact that in the questionnaire the former are overrepresented.

Insert about here Figure 2

If data on vocabulary composition confirms the predominance of nouns over verbs and closed class words, the entry of verbs and closed class words in Italian children’s vocabularies is

very rapid as testified by the significantly higher percentage increase of these two lexical classes in comparison with nouns ($F=29,31$; $p<.001$; see also figure 3). Therefore children from the first to the second sampling points acquire proportionally more verbs and closed class words than nouns even if the absolute number of nouns added is more (see raw data in Table 1).

Insert about here Figure 3

This result is consistent with the general characteristics of the Italian language, in which verbs are characterized by high level of salience and informativeness. Input characteristics, however, cannot completely bypass the semantic and cognitive factors which make nouns easier to acquire in the first phase of vocabulary acquisition.

The analysis of individual differences showed a significant correlation between the two sampling points in the percentages of nouns and closed class words (see Table 2), while the acquisition of verbs was extremely variable. This result contrasts with the findings of D'Odorico et al. (2001), where there was evidence of strong continuity of individual differences in the relative proportion of predicates from 50- to 100-word and 200-word vocabularies.

Insert about here Table 2

Finally, in order to evaluate the influence of vocabulary composition on vocabulary growth rate, we performed correlational analysis between the percentage of nouns, verbs and closed class words and the age at which children reached the vocabulary size established for the two sampling point. The analysis evidenced that children who reached the first sampling point with a higher percentage of nouns (see table 3) are more precocious than children which tended to acquire less nouns. This advantage disappears when considering the percentage of nouns at a vocabulary size of 500 words and there is no evidence of a relationships between percentage of verbs or closed class words and a faster rate of vocabulary development.

The hypothesis that the propensity to acquire nouns influences only the rapidity with the first lexical basis is construed is confirmed by the results of the correlational analysis between the percentage increase of nouns, verbs and closed class words (the best index to evaluate the predisposition to acquire a particular class of lexical items in the passage from the first to the second sampling point) and the mean number of words that children acquire per day. Analysis did not show any significant correlation (see Table 4), demonstrating that in the passage from about 200 to about 500 words the acquisition of nouns is no more related to a faster rate of vocabulary growth.

Insert about here Table 4

DISCUSSION

Claim that nouns are acquired before verbs even across languages which differ in the relative salience given in the input to these two lexical classes receive support from our results. In this study there is evidence that even at a large vocabulary size (of about 500 words) common nouns is the most frequent lexical category for Italian children, confirming the predominance of nouns even for vocabulary size higher than 200-word (observed in D'Odorico et al., 2001), and for longitudinal data in comparison with cross-sectional data (Caselli et al., 1999). Moreover, the sequence nouns-verbs of acquisition is not due to a different identification of "nouns" and "verbs" with respect to studies conducted with Korean- and Mandarin-speaking children (Choi & Gopnik, 1995; Tardif et al., 1999), i.e. we too excluded data concerning proper names and auxiliary verbs and adjectives. The comparison with data on Korean- and Mandarin languages is relevant because Italian mothers too use in the input to language learning children a higher number of verbs than nouns (considering both types and tokens) (Fasolo, 2004; cf. Camaioni e Longobardi, 2001). There are, however, methodological differences between studies which renders non conclusive the cross-linguistic comparison: while Tardif et al. (1999) analyze vocabulary composition on Mandarin- and on English-speaking children with the same age, but with different vocabulary size, we prefer to

consider children at different ages, but with a similar vocabulary size. Choi & Gopnik's (1995) data regarding vocabulary composition at a fixed vocabulary size of 50 words are, on the other hand, controversial, confirming a predominance of nouns over verbs even for Korean-speaking children, but with a higher percentage of verbs respect those showed by English-speaking children.

Considering the saturation index (the "opportunity" for mothers to check one of the items composing questionnaire), it is possible to see that at the first sampling point children are credited by mothers to produce less than 40% of possible common nouns, and less than 20% of the other two lexical categories here considered; this means that the lower percentage of verbs is not due to the fact that nouns are overrepresented in the CDI. At the second sampling point, which is near to the ceiling of 670 words, the saturation index for verbs is no more different from that of nouns, still the percentage of nouns is significantly higher than that of verbs.

Even if common nouns is the predominant lexical category, verbs and closed class words increase significantly their value in the passage from first to second sampling point: for these two lexical categories, the percentage of new items acquired is significantly higher than the percentage of common nouns acquired in the passage from Time 1 to Time 2. This phenomenon could be due to the fact that at the first sampling point children had in their vocabulary a small number of verbs and closed class words. Obviously, this influences the result of comparison of percentage increases: even if children at the second sampling point have in their vocabulary about five times the number of verbs they had in the previous sampling point, the absolute number of verbs and closed class words they acquire is lower than that of nouns.

The predominance of nouns in Italian children's vocabulary is demonstrated in this study through the analysis of mothers' report. This does not exclude the possibility that in the children's spontaneous production the relative frequency of nouns and verbs is different, even if studies focused on direct comparisons of composition of children's vocabulary obtained by analysis of spontaneous speech sample or mothers' report showed a substantial relationship between the results obtained with the two different methods (cf. Tardif et al. 1999; Salerni et al., 2005)

Another aspect investigated in this study is the evaluation of stability on the acquisition of different lexical category. On the contrary respect to the evidence by D'Odorico et al. (2001), which found a continuity on the acquisition style for common nouns, predicates and function words, we found a correlation only for common nouns and closed class words, but not for verbs. This can be explained by two orders of considerations. First, in D'Odorico et al.'s study, authors find continuity of individual differences in the percentages of predicates which is much larger than the percentages of verb (see above). Secondly, individual differences could be obscured by the very large percentage increase of verbs in the period of vocabulary development analyzed in this study. In D'Odorico et al.'s study (2001) they related individual differences with regard to verb percentage scores in the first and in the second 100 words acquired, where an increase between the two point was observed of about 4% (from about 10% to about 14%). In the period of development examined in this study children more than redouble the percentage of verbs in the second sampling point and this massive acquisition might have obscured individual differences between children.

Children who had a higher percentage of common nouns in the first stage of vocabulary acquisition have a more rapid vocabulary growth as testified by the more precocious age at which they reached the 200-word and the 500-word sampling point. Nouns are important for the acquisition of the first lexical basis as demonstrated also by Fasolo and D'Odorico's study (2002) in which Late Talker children (i. e. children who have at 24 months of age a vocabulary size lower than 50 words) showed a lower percentage of nouns than average developing children at a vocabulary size of 50 and 100 words. In the following stages of vocabulary acquisition, however, children who showed a larger percentage increase in nouns than in verbs or in closed class words are no more advantaged.

APPENDIX

	Sex	Parity	Education of mother	First sampling-point		Second sampling-point	
				Age	Voc.	Age	Voc.
Andrea	1	2	1	24;11	203	26;03	555
Marcello	1	2	2	23;02	184	26;12	524
Laura	2	2	3	26;03	248	28;02	508
Martina	2	1	3	20;01	208	24;00	478
Federica*	2	1	3	19;03	211	24;04	614
Mattia	1	1	2	20;02	281	24;06	522
Elisabetta	2	2	2	22;29	199	32;08	467
Teresa	2	2	3	19;28	216	23;28	472
Gloria*	2	1	2	22;00	202	24;00	416
Claudia	2	2	2	24;06	195	30;05	421
Leonardo	1	2	2	21;24	247	27;08	536
Linda*	2	2	2	17;28	169	24;05	541
Federico	1	1	3	20;00	232	23;28	541
Gaia	2	1	3	18;05	239	20;07	527
Leonardo	1	1	2	21;01	167	25;09	517
Alessia	2	1	2	24;07	196	27;05	515
Veronica*	2	1	3	20;07	199	24;08	441
Marcello	1	3	3	25;05	270	28;03	580
Lorenzo*	1	1	2	20;00	205	24;00	540
Ludovico	1	2	3	28;00	213	30;01	448
Davide	1	1	3	18;00	233	24;06	648
Sharon	2	2	1	26;05	234	28;06	570
Filippo	1	1	3	26;06	238	32;13	462
Marco	1	2	3	26;13	223	29;22	589

Demographic information regarding the sample: sex (F: female; M: male), parity (1: first-born, 2: second-born, 3: third-born), Education of mother (1: 8 years of education, 2: 13 years of education, 3: 18 years of education), age (months;days) and vocabulary size at reaching of fixed vocabulary size of 100, 200 and 500 words. *Children who participated in D'Odorico et al.'s study (2001).

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TABLE 1: *Descriptive statistics for the vocabulary composition measures at the two sampling points.*

Measures	Percentage (raw data)	S.D.	Confidence intervals
Vocabulary composition			
First sampling point (mean: 217 words)			
Common nouns	59,29 (131)	6,71	55,44-63,13
Verbs	6,05 (13)	3,18	4,23-7,88
Closed class words	8,63 (14)	4,55	6,02-11,23
Second sampling point (mean: 518 words)			
Common nouns	53,56 (278)	5,36	50,49-56,63
Verbs	14,16 (74)	2,47	12,75-15,58
Closed class words	12,27 (62)	1,97	11,41-13,40
Saturation index			
First sampling point			
Common nouns	39,17	8,40	34,21-43,18
Verbs	12,30	7,06	8,72-17,33
Closed class words	16,29	9,15	12,49-22,84
Second sampling point			
Common nouns	83,30	7,79	77,12-88,18
Verbs	71,41	16,47	62,19-81,26
Closed class words	59,78	13,21	54,02-68,26
Percentage increase			
Common nouns	118,94	37,10	
Verbs	692,05	534,17	
Closed class words	306,43	160,02	

FIGURE 1: *Vocabulary composition at the two sampling points.*

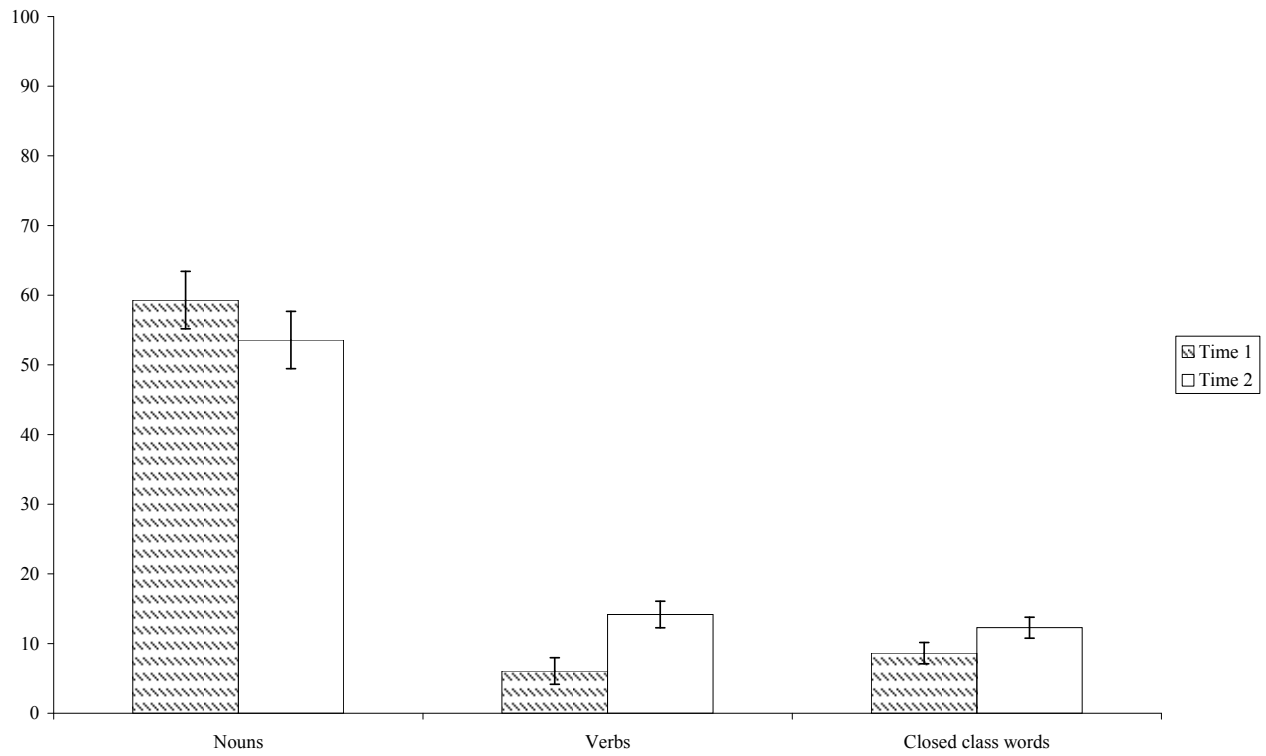


FIGURE 2: *Saturation index at the two sampling points.*

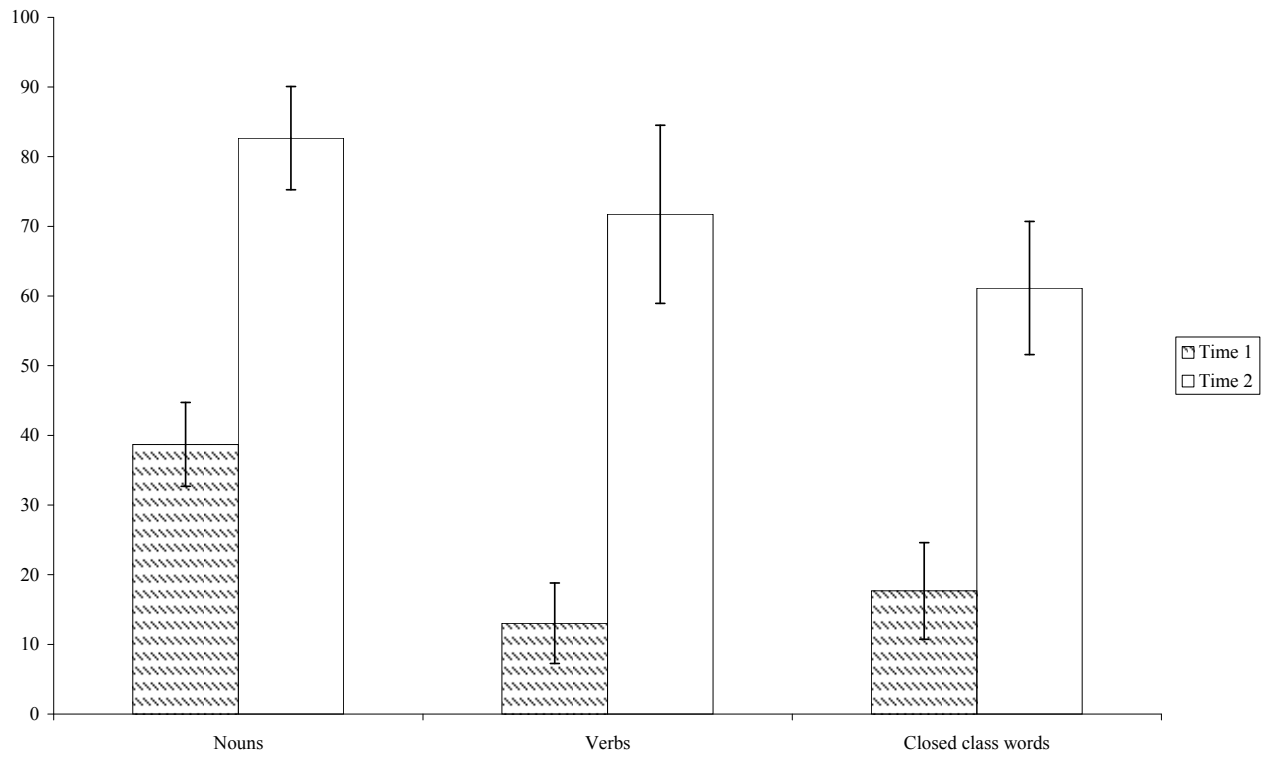


FIGURE 3: *Percentage increase from the first to the second sampling point.*

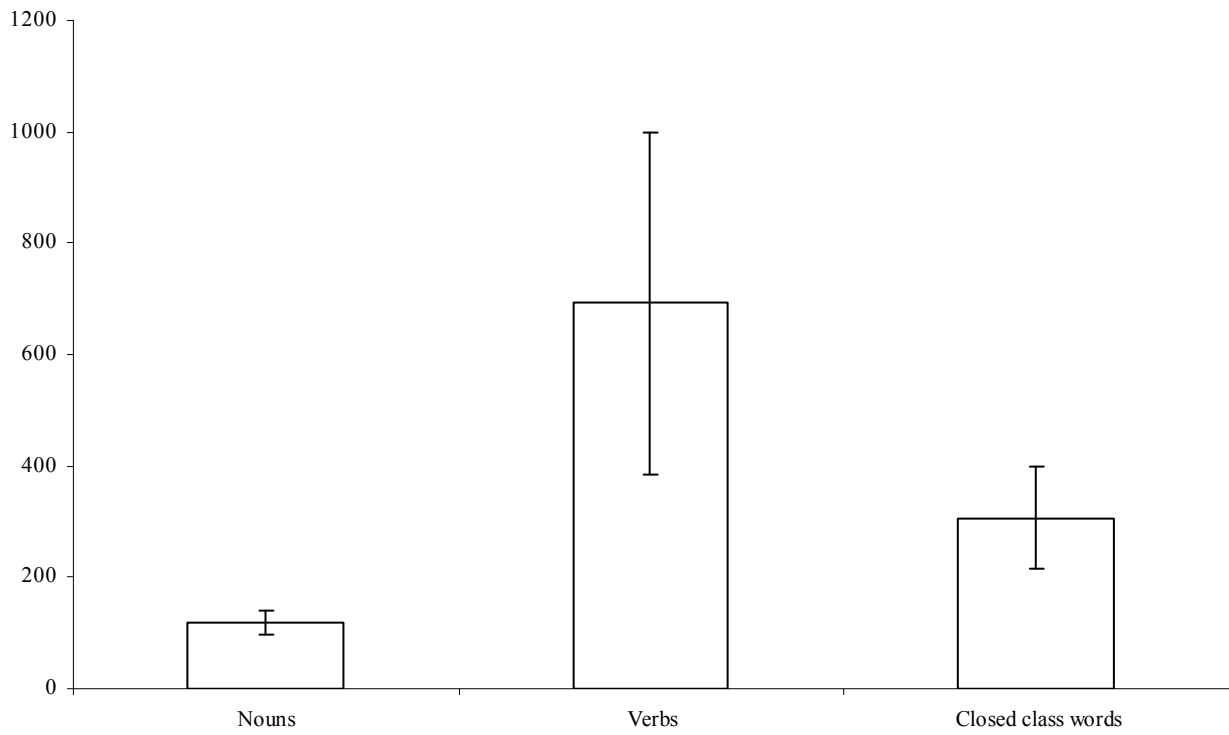


TABLE 2: *Longitudinal correlation between common nouns, verbs and closed class words at the two sampling points.*

	Pearson	p
Common nouns	0,539	0,007
Verbs	0,235	NS
Closed class words	0,584	0.003

TABLE 3: Relationships between percentages of nouns, verbs and closed class words and the ages at which the two sampling points are reached

	Pearson's r	
	Age at 1 st s.p.	Age at 2 nd s.p.
First sampling point (mean: 217 words)		
Common nouns	-0,411*	-0,345*
Verbs	0,317	0,176
Closed class words	0,312	0,204
Second sampling point (mean: 518 words)		
Common nouns		-0,305
Verbs		-0,029
Closed class words		0,037

TABLE 4: Relationship between percentage increase of common nouns, verbs and closed class words and vocabulary growth rate .

	Pearson	p
Common nouns	0,193	NS
Verbs	0,032	NS
Closed class words	-0,222	NS

¹ The upper limit for CDI age is 30 months. However, the rationale of our data collection is to longitudinally follow vocabulary development until children reached a vocabulary size at least of 400 words. For one child, this implied to continue questionnaire administration up to 32 months. This child, however cannot be considered a late talker given that the mean vocabulary size at 30 months of age is, according to Italian normative data of 446 words (DS=168).

² $(\text{vocabulary size at second sampling point} - \text{vocabulary size at first sampling point}) / (\text{age at second sampling point} - \text{age at first sampling point})$

³ $[(\text{category value at second sampling point} - \text{category value at first sampling point}) / \text{category value at first sampling point}] * 100$

⁴ APA (2001) Publication Manual calls Confidence Intervals “the best reporting strategy” (p. 22)