What's in a word?: describing development in the one-word stage

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The purpose of this paper is to start to integrate several apparently disparate lines of inquiry into the development of children's linguistic knowledge during the one-word stage. In most previous studies, researchers have concentrated on just one aspect of linguistic description of children's early words (e.g., phonology or semantics). In doing so, they may have missed important synchronic development of different aspects of children's linguistic knowledge. Most researchers agree that children's initial productions (usually before the age of eighteen months) are not «truly» words, for at least three reasons. First, these early productions lack conceptual denotation; they are generally embedded in a ritualized context and thus have either no reference at all or else only a very specific reference (see Vihman, 1996). According to Walley (1993), «the emergence of the interpretive scheme has yet to be tied to specific aspects of lexical development, such as its increasingly context-free nature» (p.297). Secondly, children's early productions have relatively inconsistent phonology. For example, it has been noted that phonetic features can sometimes be produced correctly in some words and not in others. For children's first 50 or so words, children seem to have a separate articulatory approach to each of their words (Ingram, 1976). Thirdly, it is not clear that children's initial productions can be tagged by differentiated lexical categories (such as object, action, modifier, etc.; see Dromi, 1987). After the period of these early prouductions, according to many researchers, at about the age of 18 months (with wide individual differences), children's productions undergo a radical change: they start to produce true words. Their words become denotational (that is, they refer to a concept rather than only to a specific instance); their phonology becomes systematized; and their words reflect knowledge of lexical categories (Dore, 1985; Dromi, 1987; Ingram, 1976; Nelson, 1973).

The question we focus on is: do these changes occur simultaneously or serially? We consider the possibility that a single cognitive change underlies the shift in children's language production from context-embedded proto-words to true words with respect to all three variables discussed above. That is, that children's systematization of their lexicon on the level of denotation, lexical category and phonological consistency occurs together.

METHODS

We consider data from two children, both girls. One child, Isadora, was acquiring Brazilian Portuguese. She was videotaped 2 times a week in 30-minute sessions. By the last session, she was using approximately 50 different words so her data may show the shift often seen at around the 50-word mark. The other child was Leopold's (1949) daughter, Hildegard, who was acquiring German and English. Leopold kept a detailed diary on Hildegard's words and how she pronounced them between the ages of 10 months and 2 years; he took less detailed notes of the context in which she used her words so the analyses are based only on the available data. Isadora

reached fifty words at about 16 months of age and Hildegard reached the same number of words at about one month later. Three variables were considered: phonoarticulatory consistency (our operationalization of phonological consistency), rate of denotational words and rate of clear lexical categories. A short description of how these variables were operationalized follows.

1) Phonoarticulatory consistency was operationalized slightly differently for the two girls because their data were from different sources but in both cases it referred to the number of words that had more than one consistent pronunciation. A difference in pronunciation was identified only by a change in consonants for Hildegard and in the case of the Brazilian Portuguese-speaking girl, either a change in consonants and/or a change in the number of syllables used to pronounce a particular word type.

2) To identify the rate of denotational words, the children's uses of words were categorized as either imitations, contextualized words, referential, denotational or uncategorizable, following Dore's (1985) categories. For Hildegard, an average of 34% of her words were not categorizable from the information in the diary. The rate of denotational words was calculated as the number of words showing a clear denotation out of the total number of categorizable words.

3) As for lexical category, the children's words were categorized into actions, modifiers, objects, social words, indeterminate, or uncategorizable, following Dromi (1987). In addition, we suggest another category: instrumental words, those words used for solving the childs immediate needs. An average of 44% of Hildegard's words were not categorizable from the information given in the diary. The rate of words showing a clear lexical category was calculated as the number of words with a clear lexical category out of the total number of categorizable words.

RESULTS

Figure 1 shows the percentage of Hildegard's words that were denotational, that showed a clear lexical category or that were pronounced with consistent phonoarticulation. Her phonoloarticulatory consistency starts off at about 50% and rapidly increases (with some variation). Her words showing a clear lexical category increase suddenly at 11 months and then only gradually. In contrast, the increase in denotational words looks fairly gradual over time. There is no radical shift in any of these variables at around 50 words (17 months of age).

Figure 1. Hildegard's Words

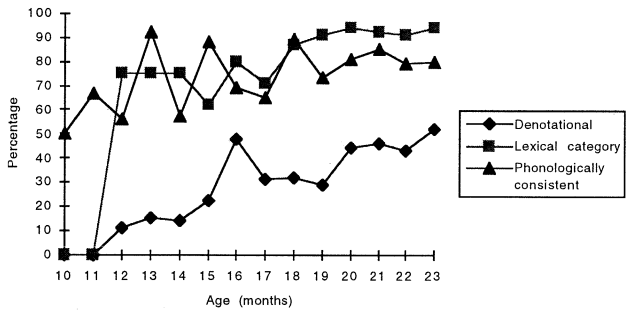

Table 1 presents the correlation coefficients for the variables of interest. All the variables correlated, suggesting that they might be increasing simultaneously. It should also be noted that all three variables correlate positively with age: that is, phonoarticulatory consistency, rate of denotational words and rate of clear lexical categories all increased as Hildegard got older.

Table 1. Correlations of the Word Categories for Hildegard

	Age	Phonoarticulation	Denotational	Lexical category
Age	–			
Phonoarticulation	.540*	–		
Denotational	.911*	.510	–	
Lexical category	.777*	.515	.793*	–

*p<.05

Figure 2 shows the percentage of the Portuguese-speaking girl's words that were denotational, that showed a clear lexical category or that were phonoarticulatory consistent. This graph is not as clear as Hildegard's (probably because the data points were on a weekly basis rather than a monthly basis), but roughly speaking, all three variables increased over time.

Figure 2
Isadora's Words

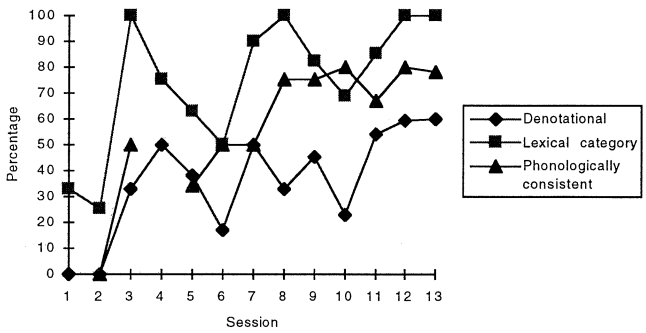

Table 2 shows the correlations between the relevant variables for Isadora. The correlations in this table hold up the impressions from the graph. As for Hildegard, the three variables of interest are highly and positively correlated. Again, everything also correlates highly with age.

Table 2
Correlations of the Word Categories for Isadora

	Age	Phonoarticulation	Denotational	Lexical category
Age	–			
Phonoarticulation	.851*	–		
Denotational	.718*	.662*	–	
Lexical category	.654*	.758*	.842*	–

*p<.05

DISCUSSION

The results of this study do not support a radical shift in systematization of words applying to phonoarticulatory consistency, denotation and lexical category simultaneously. There is, however, some support for the idea that all three might show gradual synchronous change. For both girls we looked at, the three variables of interest were all highly and positively correlated with each other and with age. It would be unwise to use age as a marker of cognitive development between children because there is a great deal of individual variation in the rate of development. Since we assume that these children were developing normally, however, their age could be considered a reasonable estimate of their cogntive development. Thus, it is possible to interpret the fact that age correlated with all three lexical variables in this study as suggesting that changes in the children's cognitive development were responsible for the gradual reorganization of their lexicons.

Further evidence pointing to a gradual synchronous change comes from the fact that at the end of the period of time presented in this study, most of the old words used by the Portuguese-speaking girl had settled into a consistent phonological form while her new words still showed some fluctuation in pronunciation. For example, the old word «tio» (uncle) began to have a consistent phonoarticulatory form while the new word «sai» (go away) showed phonetic fluctuation. It would be interesting to know if this anecdote generalizes to all children's reorganization of their lexicon in terms of phonology, denotation and lexical categories. That is, children's reorganization of their lexicon may take place on a word-by-word basis.

To sum up, the results of this study point to the interesting possibility that children systemize several aspects of their word knowledge in a gradual and synchronous manner. Naturally, they are far from conclusive and we welcome further research in this area.

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