Psychology of Language and Communication 2014, Vol. 18, No. 3

DE GRUYTER OPEN

DOI: 10.2478/plc-2014-0014

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PARENT-CHILD INTERACTION AND LEXICAL ACQUISITION IN TWO DOMAINS: COLOR WORDS AND ANIMAL NAMES

This paper explores young children's and parents' use of color words and animal names in two published studies. The aim is to compare the ranges and kinds of these words in parent-child interaction and to consider the implications of these findings for our understanding of early lexical development. Color term data were drawn from the Gleason corpus in CHILDES: 12 boys and 12 girls ranging in age from 25-62 months, and their parents. Results showed that parents used and emphasized only the same 10 most basic colors, with many teaching episodes. Parents' most frequent terms, *red, blue,* and *green* were also children's most frequent terms and are the ones acquired earliest according to MacArthur Bates lexical norms. In the second study CLAN programs were used to identify animal names in corpora from a variety of families in CHILDES, with 44 children ranging in age from 1;6-6;2. Children and parents produced a remarkable number and range of animal terms, with individual preschoolers naming as many as 96 different, often rare, animals, such as *crocodile* and *pelican*. Parents and children thus attend to the same limited set of basic color terms. By contrast, biophilia, our shared human love of the living world is reflected in children's extensive animal lexicon.

Key words: animal names, biophilia, color terms, lexical acquisition, parent-child interaction

Introduction

Children everywhere acquire the basic words of the languages around them in a remarkably consistent and predictable way. An examination of early words in many different languages as revealed by work such as the *MacArthur-Bates Communicative Development Inventories* (Fenson et al., 2007) shows that infants

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and young children come to know a basic set of words having to do with the world around them that is fairly consistent across children and cultures. Children's early language reflects their cognitive and linguistic developmental stage as well as their interests in the people, animals, and objects in their world. Early vocabulary typically encompasses a variety of lexical domains that are part of the young child's life: words for toys, familiar people, foods, animals, common actions, body parts, clothing, games, properties, etc. Children have cognitive limitations that make it unlikely that they will have words dealing with abstract entities or the past or future. There are also many other suggestions in the literature about very young children's preferences for words that are not only associated with salient aspects of their lives, but that have phonological and other features that make them easier or more appealing.

Children do not acquire language as an intellectual or linguistic tour de force, however. Rather, language is acquired through interaction with others. Parents employ a range of strategies that may influence children's acquisition of words. For instance, they often label objects in the child's world, putting the target word at the end of an utterance and accenting it: "Look at the *kitty*." Although adults often follow the child's lead in this sort of labeling by naming what the child is attending to, they also name things that they want to call the child's attention to. Parents' decisions to name or not name things may convey the parents' own proclivities and world views. For instance, in going for a walk with a toddler, a parent is more likely to say "Look at the birdie" than "Look at the brick." In this brief paper, I am going to examine parent-child interaction in the acquisition of vocabulary in two lexical domains: color terms and animal names. In both of these domains we can see ways in which children's possibly inborn proclivities interface with characteristics of adults that may also reflect their own cognitive and emotional propensities.

Color Terms

Color terms are an important component of children's developing lexicons. Children must learn the words themselves, as well as how to apply them correctly to various referents in their surroundings. A number of authors have proposed that children's acquisition of color terms reflects a universal color hierarchy. The color hierarchy most frequently investigated both cross culturally and developmentally was proposed by Berlin and Kay in 1969 after they had examined the lexicons of nearly 100 languages and found that there were 11 basic color terms used by the languages of the world. According to this hierarchy, *black* and *white* are the most universal terms. *Red* comes next: If a language has 3 color terms it is likely to have *black, white,* and *red*. The presence of color terms like *pink* or *grey* in the lexicon of a language presupposes the prior existence of hierarchically more basic terms like *red* and *black*.

Other researchers, including Miller and Johnson-Laird (1976), have proposed that of the 11 basic colors, there are 6 that children learn first because they are in some sense more salient and the most basic 'landmark' colors. Miller and Johnson-Laird proposed that the basic 6 landmark colors have neurophysiological correlates that make them more salient for human beings. These first 6 landmark colors of the hierarchy are *black, white, red, green, yellow*, and *blue*. The secondary colors are *brown, purple, pink, orange*, and *grey*.

Age norms for the production of common color terms are included in the MacArthur Communicative Development Inventory (Fenson, Dale, Reznick, Bates, Thal, & Pethick, 1994; Dale & Fenson, 1996) and they indicate that the first color words now appear in children's vocabularies when they are less than two years old. If a universal set of terms is learned by children, it is of some interest to find out what terms children are hearing from their parents as they acquire their lexicons. It is also of interest to know which color terms children actually use in their own speech during everyday activities, and how that compares with the color words that parents use in speech to them.

With these questions in mind, Richard Ely and I (Ely & Gleason, 1998) investigated the spontaneous use of color terminology in a sample of children and parents. The participants in this study were drawn from the Gleason Corpus in the CHILDES database. There were 24 preschool age children (12 boys and 12 girls) and their parents. Children's ages ranged from 25 to 62 months. The children were seen individually in a laboratory playroom twice, once with the child's mother and once with the father, for a half hour play session each time. On each occasion, the parent and child played with various toys and read a wordless picture book. No attempt was made to elicit color terminology, and no color-related activity such as painting was included. Twenty-two of these same families were also recorded at a family dinner. Transcripts of the dinners and laboratory sessions were analyzed for parents' and children's use of color words. Results indicated that the color words used by parents and children were exactly the ones from the hierarchy designated by Berlin and Kay and noted above, with the exception of grey, the lowest term in the hierarchy. Thus, 10 of the 11 color terms in the universal hierarchy of color words in languages around the world were used by these 24 families. In terms of pervasiveness, 23 of these 24 families used at least some color terms. Use of the color terms across all speakers can be seen in Table 1. Table 2 shows use by speaker group and norms for children from the 1996 CDI Inventory. In terms of overall frequency, the color term most commonly used by all speakers in all situations was *red. Blue* and *green* came next. Children used as many different color terms as parents, 10 of the 11 of the Berlin and Kay hierarchy.

In looking at the data, we found that the parents engaged in many teaching episodes, not called for by the situation, including naming colors and sometimes asking test questions (e.g., "What color is that cat?" while the parent and child

Table 1. Frequency of use (in descending order) of color terms by all speakers across all observations

Red
Blue
Green
Yellow
Black
Orange
White
Brown, Purple
Pink

Table 2. Frequency of use by speaker category and age norms for production of color words

Parents	**Children**	**Production norms**
blue	red	blue (22 months)
red	blue	red (23 months)
green	green	orange (23 months)
yellow	orange	green (25 months)
black	black	yellow (25 months)
orange	yellow	white (27 months)
white	white	brown (28 months)
brown	purple	black (29 months)
purple	pink	
pink	brown	

were looking at the picture book). Test questions of this type constituted 14% of the parents' use of color terms.

It is clear from this study of 24 families that color words and concepts are important to parents and children in our society. Essentially all families used color terms, and parents went out of their way to teach children color words by calling attention to colors and by asking test questions. The terms are used pervasively, and in situations where adults would not typically call attention to color in speech to one another; for instance in one transcript a father says to his daughter while reading the book: "That's a pretty flower. That's a pretty orange

flower." These data indicate that the preschool years are a time when parents are eager for all children to know the basic colors, and there is not one single usage in the 70 transcripts we analyzed of any color other than the 10 most frequent terms of the Berlin and Kay hierarchy.

This research strongly supports the presence of a restricted set of basic color words shared by parents and children. The color terms used in our observations are limited to those basic terms identified by Berlin and Kay, and no others. However, the universal order proposed by Berlin and Kay is not the same order that we found in the frequency of spontaneous production by children and parents. Berlin and Kay proposed that *black* and *white* are the most basic of the terms, and presumably the earliest acquired. *Black* and *white* were not the most frequent color terms used in our data. The terms most frequently used by parents were *blue* and *red*; the terms most frequently used by children were *red* and *blue*, and, according to published norms, *blue* and *red* are also the earliest acquired by English speaking children. Parents use *red* and *blue* most frequently and children appear to acquire these words earlier than other color words and to use them more frequently than other color words. Thus, although children's neurological and cognitive propensities may be important prerequisites for the acquisition of color terms, the role of parental input cannot be ignored. The basic color terms acquired by children are exactly those terms that are used and emphasized by their parents.

Animal Names

The color terms that adults and children use may reflect neurophysiological propensities of both adults and children to pay attention to a particular basic set of colors. Attention to animals, by contrast, may reflect both neurophysiological propensities and something about our shared emotional life. Animals are neurophysiologically salient because they move. Animals are also important to us because they are part of our biological heritage that includes a love of the living world, what the biologist E.O. Wilson (1993) calls *biophilia.* Unlike the restricted color lexicon, a rich variety of animal terms abounds in the input to the language learning child, in books, toys, stories, pictures, baby talk words, and in the things that parents point out to children. My colleague Brenda Phillips and I have found, for instance that of the most frequent 30 things that parents tell children to "look at…" 12 are animals (Phillips, Gleason, & Ely, 2014.)

In an earlier study, (Gleason, Phillips, Ely, & Zaretsky, 2009), we looked at the use of animal terms by parents and children. Some of children's earliest words refer to animals. For example, we examined the MacArthur-Bates Communicative Development Inventories and found that words such as *bear, bird, bunny, cat, kitty, dog,* and *duck* are in the comprehension vocabularies of 50% of 14-month-olds. Most of the 14-month-old's animal words, including *bear, bird, dog,* and *horse*

are very common and are included in counts of the 2000 most frequent words in English. By the age of 30 months, however, children's animal vocabularies have become very sophisticated: Over 70% of English speaking children at this age understand or produce the words *alligator* and *zebra.*

Turning to the CHILDES database, we used CLAN programs to extract all possible animal terms from the longitudinal corpora in English of Brown's famous subjects Adam and Sarah and from the Russian children Tanja and Varya in the Protassova corpus; cross sectional data were drawn from the Gleason corpus (22 children) and the Warren corpus (20 children). There were thus 44 children, who ranged in age from 1;6 to 6;2.

Across all corpora there was a remarkable range of animal terms, indicating a large animal lexicon for even very young children. For example, individual children of preschool age produced as many as 96 different animal types, including rare words like *alligator* and *pelican.* Brown's subject Adam used 96 different animal types and the adults speaking to him produced 102. Results for Sarah were similar, and the very young Russian child Tanja produced 44 animal types, and a very high rate of tokens: 14.5 per 100 utterances. The Russian children and parents also produced extremely rare words, such as *crocodile.*

This attention to animals is extraordinary, and the resulting vocabulary differs from the typical young child's lexicon in that it contains such rare words and words that are not in the here-and-now. After all, young Russian children have very little to do with actual crocodiles. The animal lexicon produced by adults talking to children and acquired by children themselves does not have the typical characteristics of early vocabulary: it is not reflective of the child's daily experience; it is not easy to pronounce; the words are not common in the language, etc. This lexicon does, however, reflect our shared interests.

Discussion

In this brief paper I have tried to show that the lexicons that children acquire are a product both of children's proclivities and those of the adults around them. Clearly, children acquire the words of the language that they hear, but there are powerful selection forces that influence just which words are added to the early lexicon. We have long known that children's cognitive biases and preferences are part of the process. What has perhaps not been so clear is that adults arrive at the interactional arena with their own similarly inherent characteristics. The frequent use by parents of the exact same 10 color words indicates both a social desire for their children to know the words and likely physiological underpinnings for the salience of the colors themselves. When we looked at the large and extensive animal lexicon we found parents going out of their way to bring every possible representation of the animal world to their children, in books, pictures, toys, and, of course, conversation. Because

this is such a pervasive phenomenon it is easy to overlook its significance, but the animal lexicon in all its complexity reflects our shared human heritage, our love of the living world.

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