The child's knowledge of English kin terms

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ABSTRACT

Five groups of subjects (three-, four-, five-, and six-year-olds as well as adults) with four males and four females per group were interviewed and questioned with respect to their knowledge of twelve English kin terms: *mother, father, sister, brother, daughter, son, wife, husband, aunt, uncle, grandmother,* and *grandfather.* A questionnaire, which in the case of the children was filled out by their parents, helped determine rank orderings for the twelve terms with respect to the estimated relative frequency subjects had: (1) spent with each of the relations; (2) heard the words spoken; and (3) spoken the words. Analyses of the data revealed that: (1) younger children tended to discuss the words in terms of particular people and with reference to personal experience, whereas older children and adults talked in a more general way; (2) the tendency to produce relational definitions of the kin terms was negligible in the preschool years and became increasingly more frequent thereafter; (3) although with age definitions of the kin terms became more accurate, even the definitions of adults were not typically stated in terms of reciprocity; (4) experience as assessed by each of the three sets of parental rankings was successful in predicting both the quality of definitions provided by the children and the order of acquisition of the kin terms, whereas measures of semantic complexity were less successful in doing so.

It has often been established that word meanings gradually develop with age (e.g., Vygotsky 1962). In numerous previous studies researchers have

attempted to determine the factors contributing to the formation of verbal concepts and the order of acquisition of words. Clark (1973) developed a semantic feature hypothesis, one of the tenets of which was that semantically simpler terms are acquired earlier than those terms which are semantically more complex. Other researchers have held that experience may affect word learning and concept formation. For example, Danziger (1957) stated that verbal concepts are based on opportunities offered by the environment, and Anglin (1977) has argued that the words learned by preschool children reflect parental naming practices and that the concepts and meanings initially encoded by these words are frequently dependent on the child's ability to recollect specific encounters he or she has had with particular exemplars of the concept or referents of the word. The present study focuses on the semantic development of kin terms.

With respect to semantic development, the study of English kin terms is particularly appropriate. For example, several such terms are often learned, to some extent, well before the child goes to school. Thus, even for very young children, the meanings underlying kin terms can be studied.

Second, kin terms represent people, some of whom (like mothers and fathers) may be extremely important to the child, while others (like husbands and wives) may be of far less significance for him or her. So, for kin terms, the influence of factors such as experience and relevance on semantic development may be examined.

Third, although kin terms like *mother* and *uncle* are a kind of noun they are semantically and conceptually very different from other nouns and, in particular, object names like *dog* and *ball* which have received considerable attention from developmental psycholinguists in the past (e.g., Anglin 1977, 1983, Brown 1958, Macnamara 1982, Mervis & Mervis 1982, Nelson 1974, Rosch, Mervis, Gray, Johnson & Boyes-Braem 1976). While most object names are ill defined (Rosch 1973, Smith & Medin 1981), kin terms can be precisely defined as various componential analyses of them have illustrated (Bierwisch 1970, Romney & D'Andrade 1964, Wallace & Atkins 1960). Furthermore, whereas perceptual information can provide helpful clues in establishing whether an object name is applicable or not, the meanings of kin terms are not reliably predicted by perceptual attributes since they are based on relations among family members (Miller & Johnson-Laird 1976). Therefore, while object names are *referential* terms that denote objects or classes of objects, kin terms are *relational* words that describe an individual's position within a family (Gentner 1978, Clark 1979, Piaget 1928). Since kin terms represent a semantic field with different semantic and conceptual properties from other nouns, it would seem to be important to conduct separate studies specifically devoted to their acquisition.

A fourth unique feature of kin terms is their universality. The topic of kin

relations has been important to anthropologists and has been explored in a variety of different languages and cultures. Data on the kinship systems of various societies have been collected and analysed extensively (e.g., Alexander 1976, Hage 1976, Lave, Stepick & Sailer 1977, Ruke-Dravina 1976, Tzeng, Osgood & May 1976, Yanagisako 1978).

There has been much debate in the literature as to the validity and suitability of different representational systems of kin terms (Čech & Shoben 1980, Haviland & Clark 1974, Lave *et al.* 1977, Miller & Johnson-Laird 1976, Mufwene 1983, Oden & Lopes 1980, Winkelman 1975, Yanagisako 1978). Componential analyses of kin terms frequently discussed are the semantic feature systems of Wallace & Atkins (1960) and Romney & D'Andrade (1964), and Bierwisch's (1970) system of relational components. Of particular importance for the present study is Bierwisch's (1970) analysis.

For Bierwisch (1970) the central relational component defining kin terms is X PARENT OF Y with its inverse Y CHILD OF X. Thus the (oversimplified) lexical entry for *father* is defined in terms of one relational component and one sex-specifying property feature as follows:

father: [X PARENT OF Y] [MALE X].

The complete entry for *father*, however, should be supplemented by redundancy rules stating that the dummy variables X and Y are animate and that the first member of this relation should be marked as adult. Thus the complete lexical entry for *father* is:

father: [X PARENT OF Y] [MALE X] <ADULT X> <ANIMATE X> <ANIMATE Y> where the redundant components are enclosed in angled brackets (cf. Haviland & Clark 1974).

The simplified entry for *brother*, a more complex term in Bierwisch's system, is:

brother: [X CHILD OF PARENT OF Y] [MALE X] where $X \neq Y$

or

brother: [X CHILD OF A] [A PARENT OF Y] [MALE X] where $X \neq Y$.

The complete lexical entry for *brother* would be represented as:

brother: [X CHILD OF A] [A PARENT OF Y] [MALE X] <ADULT A> <ANIMATE X> <ANIMATE Y> <ANIMATE A> where $X \neq Y$.

Haviland & Clark (1974) fleshed out Bierwisch's system of relational components for kin terms and developed a categorization scheme which orders them on the basis of increasing complexity. Their initial scheme is shown in Table 1. According to it lexical entries with one relational component (e.g., *father*, *mother*, *son*, and *daughter*) are the simplest. Entries with the same component recursed such as *grandfather* (*grandfather*: [X PARENT OF A] [A PARENT OF Y] [MALE X] . . .) *grandmother*, *grandson*, and *granddaughter* were postulated as being the next most complex. Entries with both relational components ([X CHILD OF A], [A PARENT

TABLE 1.   *Entries for different kin terms in order of increasing complexity*

Level	Entries
I	Entries with one relational component, e.g., *father*: [X PARENT OF Y] . . . (*mother, son, daughter*)
II	Entries with the same component recursed, e.g., *grandson*: [X CHILD OF A] [A CHILD OF Y] . . . (*granddaughter, grandfather, grandmother*)
III	Entries with both relational components, e.g., *brother*: [X CHILD OF A] [A PARENT OF Y] . . . (*sister*)
IV	Entries with both components, plus recursion, e.g., *aunt*: [X CHILD OF A] [A PARENT OF B] [B PARENT OF Y] . . . (*uncle, niece, nephew, cousin*)

(Haviland & Clark 1974: 36)

OF Y]) such as *brother* and *sister* were viewed as being next most complex. Finally, entries with both relational components, plus recursion such as *aunt* ([X CHILD OF A] [A PARENT OF B] [B PARENT OF Y] [FEMALE X]. . .), *uncle, niece, nephew,* and *cousin* were hypothesized to be most complex. Haviland & Clark (1974) also used a revised scheme of complexity in which entries with the same component recursed (e.g., *grandfather*) were treated as more complex than entries with both relational components (e.g., *brother*). They argued that the initial ranking of these two types of entries was arbitrary and as it turned out their developmental study revealed that the alternative scheme was more predictive of children's knowledge of the terms. Both of these methods of organizing kin terms according to semantic complexity have been used in the present study.

A common method for studying the acquisition of kin terms, which has been adopted in the present investigation, has been to interview children of different ages with respect to their knowledge and understanding of such terms (Danziger 1957, Elkind 1962, Haviland & Clark 1974, Piaget 1928, Swartz & Hall 1972, see also Carter 1984, Chambers & Tavuchis 1976). These studies have consistently revealed a qualitative change with development in the definitions and descriptions of kin terms produced by children of increasing age levels. Piaget (1928) studied the definitions produced by children ranging in age from four years to twelve years for the terms *brother* and *sister*. He identified three 'stages' in the development of such definitions. In Stage 1 children would simply define *brother* as a boy and *sister* as a girl. In Stage 2 the child would express his or her realization that there had to be more than one child with the same parents in order for there to be a *brother* or a *sister*, thus demonstrating to a degree an appreciation of

the relational nature of kin terms. However, Piaget stressed that Stage 2 children did not appreciate the reciprocal nature of this relation, that having a brother or a sister necessarily implies that one is oneself a brother or sister. By about 9 years of age children had progressed to Stage 3 at which time their definitions were both relational and reciprocal. Subsequent studies by Elkind (1962) and Swartz & Hall (1972) basically replicated Piaget's results.

In another study Danziger (1957) interviewed children from 5 years to 8 years concerning their knowledge of five kin terms: *brother, sister, daughter, cousin,* and *uncle.* Each child was asked 'What is a(n)____?' as well as additional probe questions. Danziger identified four 'stages' in the development of kin term concepts which he named Precategorical, Categorical, Concrete Relational, and Abstract Relational. The first Precategorical stage which had not been mentioned by Piaget was characterized by definitions given by some of the youngest children who simply named a specific person. The last three stages Danziger identified were similar to Piaget's three stages but, especially in the case of the last two, were not identical. In particular, children whose responses Danziger classified as being Concrete Relational mentioned certain concrete relations or 'bonds' among relatives such as having the same name, living in the same house, etc. but did not explicitly describe kinship relations. It was only in what Danziger described as Abstract Relational definitions that children revealed that they now appreciated the relation as part of a system of relations (kin relations in this case). Whereas Piaget had attributed reciprocity only to the highest stage, Danziger argued that children using Concrete Relational definitions sometimes partially appreciated reciprocity but that this appreciation broke down when the child's own relationship was involved.

Haviland & Clark (1974) in an important study interviewed 50 children from three years to eight years, ten months and asked each child to define the following 15 kin terms: *mother, father, grandmother, grandfather, son, daughter, grandson, granddaughter, brother, sister, aunt, uncle, niece, nephew,* and *cousin.* For each term Haviland & Clark asked the children 'What is a ____?' as well as additional questions when possible. The children's definitions were then classified into four categories. If the children just named a particular person, if they said they did not know what the term meant, or if they gave an incorrect.or irrelevant response, their definitions were classified into Category One, corresponding roughly to Danziger's Precategorical stage. If the children mentioned 'property' features such as sex and/or age to define a term, their definitions were classified into Category Two, corresponding to Piaget's Stage 1 and to Danziger's Categorical Stage. If children's definitions were relational but not yet reciprocal they were classified into Category Three, corresponding to Piaget's Stage 2. Finally, if children's definitions were both relational and

reciprocal they were classified into Category 4. Consistent with earlier studies Haviland & Clark found that as children got older their definitions moved up from Category 1 to increasingly higher levels, although even their oldest subjects produced Category 3 definitions more often than Category 4 definitions.

Haviland & Clark (1974) went beyond earlier developmental studies not only by examining more kin terms but also by focusing more explicitly on the issue of their order of acquisition. They ranked the kin terms according to the mean level of definition achieved by the children and used this ranking as a measure of their order of acquisition. Furthermore, they derived two metrics of semantic complexity from Bierwisch's (1970) analysis of kin terms into relational components (which have been outlined above) and they found that these metrics of complexity were predictive of their order of acquisition, thus supporting Clark's (1973) earlier theory of the acquisition of word meaning. On the other hand, they found that experience with kin as assessed by parental questionnaires was not very predictive of their order of acquisition.

Other developmental psycholinguistic studies (Chambers & Tavuchis 1976, Danziger 1957, Deutsch 1979) as well as some anthropological studies (Brown 1976, Jordan 1980, Yanagisako 1978) have implicated to a degree the role of experience in influencing the acquisition of kin terms. For example Danziger (1957) concluded that the differences in a child's level of definition across terms indicate that 'the level of conceptualization depends to a large extent on the child's *experience* in handling the different types of content' (p. 230, italics ours). However, the evidence Danziger presented suggesting the role played by experience in influencing the acquisition of kin terms was somewhat anecdotal. Similarly the results of others cited above implicating the role of experience in the acquisition of kin terms were also often unsystematic and at times ambiguous, mostly because this issue was often not their central concern. Therefore, the present study was designed specifically to test the hypothesis that experience would prove to be a relevant factor in the acquisition of kin terms. Since Haviland & Clark (1974) found that experience did not predict the child's acquisition of such terms whereas semantic complexity did, a major goal of the present interview study was to assess the power of measures of experience as well as of measures of semantic complexity to predict the order in which children acquire kin terms.

METHOD

Subjects

There were five groups of subjects with four males and four females per

group. The ages for the groups were 3;0.15 to 3;9.7, 4;1.11 to 4;11.27, 5;0.6 to 5;9.24, 6;2.3 to 6;10.16, and 21;1.13 to 23;0.2 (in years;months.days) respectively. Of the 16 subjects in groups one and two, 10 were interviewed in a University preschool. The remaining six children were interviewed in their own homes. The 16 subjects in groups three and four were interviewed in a separate school. The fifth group of adults, interviewed in their own homes, consisted of eight University undergraduates from diverse faculties.

Materials

Each subject was interviewed individually with respect to his or her knowledge of 12 kin terms, specifically, *mother*, *father*, *sister*, *brother*, *daughter*, *son*, *wife*, *husband*, *aunt*, *uncle*, *grandmother*, and *grandfather*. All interviews were tape recorded.

In addition to the data collected from the interviews, a questionnaire was used to assess each subject's familiarity with the terms and the concepts they encoded. With respect to the twelve kin terms, the questionnaire required that three questions be answered. Specifically, we asked that the twelve terms be ranked according to: (1) the amount of time subjects had spent with each of the relations, (2) the number of times subjects had heard the words spoken, and (3) the number of times subjects had spoken the words. For the children, parents completed the questionnaires on their behalf.

Procedure

Subjects were tested individually in a room as distraction free as possible. During the interview, three questions were asked about each of the twelve kin terms. The kin terms were presented in a random order and the three questions were asked in a consistent order, as follows: (1) 'What is a(n) _____?', (2)'Tell me everything you know about a(n) _____.', and (3)'What kind of a thing is a(n) _____?'. When appropriate, supplementary general probe questions were asked to follow up subjects' responses.

If a child confused a kin term with a homophone (i.e., *aunt* with *ant* or *son* with *sun*), the interviewer attempted to eliminate the confusion by first saying 'I was thinking of a different kind of *aunt/son*. Do you know what that *aunt/son* might be?'. If the child was still having difficulty, the interviewer would add 'I was thinking of an *aunt/son* that's a person.' Subsequently, no further hints were given. The adult subjects were told that they were participating in a study concerning children's knowledge of kin terms. The interview followed the same format with the adults as with the children.

The interviews lasted from 15 to 40 minutes. According to time regulations of the preschool, lengthy interviews were to be divided into two sessions which was necessary only in the testing of one four-year-old girl. After the interview parents of the children were sent the questionnaires.

RESULTS

All conversations were transcribed and analysed. The following excerpts from the conversations illustrate the qualitative nature of the responses. These particular excerpts deal with the term *uncle*. Note the increased sophistication of the responses as the subjects' ages increase. The first conversation is with a three year old boy (3;0.15).

I: What is an uncle?
S: Uncle A. (male name)
I: Tell me everything you know about an uncle.
S: Uncle H. (male name)
I: Anything else?
S: You know. . .Yogi's an uncle. . .Yea. . .Booboo's an uncle.
I: Is Booboo an uncle?
S: No, he's a Booboo boy. . .
I: What kind of a thing is an uncle?
S: Um. . .um. . .Yogi.

The second excerpt is from our interview with a five year old boy (5;4.27).

I: What is an uncle?
S: Uncle. I don't know. . .
I: Tell me everything you know about an uncle.
S: He's a man.
I: He's a man. Do you know anything else?
S: He can do stuff. He can work. (pause) I think. . .also. . .they can. I forget 'dat was. (pause) They make the money as they work.
I: They work and they make money. Do you know anything else about uncles?
S: No.
I: What kind of a thing is an uncle?
S: He's a man.

The third excerpt is from our interview with a six year old boy (6;2.21).

I: What is an uncle?
S: A man that's related to ya.
I: Tell me everything you know about an uncle.
S: He knew you when you were a baby. . .Sometimes they work to build houses. . .Sometimes they join in for the army.
I: Can you tell me anything else about an uncle?
S: They help you. That's all I know.
I: What kind of a thing is an uncle?
S: A man that's related to you.

The final excerpt is part of a conversation with an adult (male, 22;8.23).

I: What is an uncle?
S: An uncle is the brother of either the mother or father.
I: Tell me everything you know about an uncle.
S: Well, an uncle is similar to an aunt. . .An uncle is one who you look
      upon as having qualities similar to your parents on which side he is kin
      to. . .I guess, an uncle, to me, is more important than any of the
      others, except a mother and father, as far as my upbringing is con-
      cerned. Just the way my uncles have played a role in my life.
I: What kind of a thing is an uncle?
S: An uncle's a person.

All such conversations were transcribed and analysed. The first analysis
assessed the level of generality of the responses. The four level categor-
ization scheme which was developed is outlined in Table 2.

TABLE 2.   *Categorization scheme for level of generality of the responses*

Score	Definition
O	Not known, incorrect, or irrelevant responses
I	Particular instances of the term, subordinates, or reference to personal experience
G	General or abstract definitions
B	Both an instance-oriented and general response given for the same term

For each subject, one score was determined for each term.

Responses were given a score of 0 if the child did not know the kin term, or
gave an incorrect or irrelevant response. If the child gave a subordinate or
particular instance or talked about the term with reference to personal
experience, an instance-oriented score (I) was given. If the response was
general and abstract, it was scored G, and if there were both instance-
oriented and general responses given for the same term, the subject received
a score of B for 'both'. For each kin term, one score was given. If any
irrelevant responses were produced for a term, but a higher score (i.e., I,B,
or G) could be given for other things said about the same term, the subject
would receive credit for his/her best response.

Inter-rater reliability was assessed by having a second judge classify all
responses for one complete transcript for one subject from each age group.
There was 92 percent agreement between the two raters. Differences were
resolved through further discussion.

The results of this analysis, shown in Table 3, revealed that the three-year-olds' responses were most often classified as 0 and next most often as I. Beyond the three year age level there was a decrease in the percentage of responses classified as 0 or as I and an increase in those classified as G. In general, there was also an increase in the percentage of responses classified as B for the children although the adult group produced a relatively small percentage of such responses (15.62%) with the great majority of their responses being classified as G (84.38%). Thus when three-year-olds indicated some knowledge of the kin terms this was most often expressed in terms of specific examples or with reference to personal experience. With age the tendency to discuss the words in terms of specific instances decreased whereas the tendency to talk about them in a more general way increased. Consistent with these trends, the younger children tended to describe the terms without mentioning any general class (e.g., 'parent', 'relative','man', 'woman', 'person', etc.) whereas older children more often mentioned such superordinate terms and adults usually did so.

TABLE 3.   *Percentage of responses categorized according to level of generality as a function of age*

| Age | Level of generality | | | |
	0	I	G	B
Three-year-olds	43.75	27.08	19.79	9.38
Four-year-olds	22.93	12.50	26.04	38.54
Five-year-olds	26.04	19.79	18.75	35.42
Six-year-olds	9.38	7.29	35.42	47.91
Adults	0.00	0.00	84.38	15.62

To test the prediction that the distribution of responses into the four levels would change significantly as a function of age and to see whether they changed as a function of sex, two multivariate analyses were performed. In the first there were two independent variables: age with five levels (3-, 4-, 5-, and 6-year-olds and adults) and sex with two levels (male and female). The four dependent variables for this analysis were minus the log of the proportion ($-\log P$) of O,I,G and B responses for each subject. The results of this analysis revealed that the effect for age was significant [$F(16,83)=5.37$, $P<0.0001$] but that neither the effect for sex nor the age by sex effect was significant [$F(4,27)=1.76$,n.s.; $F(16,83)=1.07$,n.s., respectively]. Thus the distribution of responses into the four different levels changed significantly as a function of age but not of sex. The second multivariate analysis was done to see if the significant age effect occurred for the four groups of children only. Thus the variables in this analysis were identical to those of the first

except that the age factor included only four levels (3-, 4-, 5-, and 6-year-olds). Again the effect for age was significant [$F(12,55)=3.44$, $P<0.001$] indicating that the distribution of responses into the four different levels changed reliably as a function of age when only the children's responses were analysed. As in the first analysis neither the sex effect nor the age by sex effect was significant [$F(4,21)=2.09$, n.s.; $F(12,55)=0.65$, n.s., respectively].

For the second analysis, we developed a six level categorization scheme. This system of categorization, shown in Table 4, is similar to those of earlier studies (Danziger 1957, Elkind 1962, Haviland & Clark 1974, Piaget 1928) except that ours was expanded to include six levels as opposed to the three or four used by previous researchers.

TABLE 4.   *Categorization scheme for level of definition of the responses*

Score	Definition
0	Not known, incorrect, or irrelevant responses
1	Particular instances of the term, subordinates, or reference to personal experience
2	Characteristic properties (e.g., age, sex, and other relevant features)
3	Vague expression of family relations and relations between kin terms
4	Accurate definition (i.e., appropriately defining the term's position within the nuclear or extended family)
5	Reciprocal definition

For each subject, the highest level achieved was scored for each term.

Responses were assigned a score of 0 if the child didn't know what the term meant, or gave an incorrect or irrelevant definition. The following (condensed) excerpt provides an example of the lowest level of definition:

(Male, 3;7.1)
I: What is a husband?
S: Uh. . .L. (female name)
I: Is L. a husband?
S: Yea.
I: Tell me everything you know about a husband.
S: She puts stuff on there and she breaks them. I don't want to talk about that no more.
I: OK. Just one more question about a husband. What kind of a thing is a husband?
S: A girl. . .big girl. . .

Answers were given a score of 1 if a subordinate or particular instance of a term was named, or if the term was discussed with reference to personal experience, as the following example illustrates:

(Male, 3;5.12)
I: What is a brother?
S: D. (male name)
I: D. is your brother?
S: Yea.
I: Tell me everything you know about a brother.
S: He had a bath. . .
I: Can you tell me something else about a brother?
S: We play with Santa toys. . .and hockey toys. We play with them. We break them. No, D. breaks them. . .
I: What kind of a thing is a brother?
S: Can't tell that one.

(In cases in which relatives were named as above, we subsequently verified that subjects indeed had these relations as named.)

Definitions were assigned to Level 2 if what Haviland & Clark (1974) called 'property features' including those which are criterial such as sex as well as those which are characteristic such as age were mentioned. The following excerpt illustrates this level:

(Female, 4;6.6)
I: What is a mother?
S: A big girl. . .
I: Tell me everything you know about a mother.
S: She does work. And you know what? My mother does every single thing . . .
I: What kinds of things does your mother do?
S: She. . .makes a cake. . .(pause). I don't know what else. . .She goes shopping, to preschool, um. . .goes in her lecture. And you know what? Now she doesn't have her lecture. . .
I: What kind of a thing is a mother?
S: She's a big girl.

Definitions were placed in the third category if there was some, even vague, expression of family relations and relations between or among kin terms. An example of this level is presented below:

(Male, 6;2.21)
I: What is an aunt?
S: It's a lady that helps you a lot of times too.

I: Tell me everything you know about an aunt.
S: She works a-around the house a lot. Sometimes she washes the dishes. . .
I: What kind of a thing is an aunt?
S: A lady that's related to you.
I: How is she related to you?
S: Because when you were a baby she knew your mother and your father.
I: How did she know them?
S: Your mother and father helped her move. (pause)
I: Can you tell me anything else about an aunt?
S: (shakes head no)

Accurate definitions were given a score of 4. This required that the subject appropriately define the term's position within the nuclear or extended family. The example below illustrates this type of definition:

(Female, 22;2.4)
I: What is an uncle?
S: An uncle is your mother or father's brother. Or a brother-in-law.
I: Tell me everything you know about an uncle.
S: You don't necessarily see an uncle very much. Like you've got good uncles and not so favourite uncles. And um. . .Well, you always see your parents and brothers and sisters. . .and like close relatives. Uncles aren't necessarily close. They can or can't be. . .
I: What kind of a thing is an uncle?
S: Um. . .a man.

Level 5 responses were those that stated reciprocity. The response had to include the reciprocal form of the term in the definition. For example, the reciprocal form of *grandmother* would be *grandson, granddaughter*, or *grandchild*. The following excerpt was classified as a Level 5 definition:

(Female, 21;1.13)
I: What is a daughter?
S: What is a daughter?. . .She's the female child of the mother and father.
I: Tell me everything you know about a daughter.
S: She usually models after her 'mother. . .and will pick up a lot of ideas. . .about her own identity. . .picks up her own identity. . . (pause). . .
I: What kind of a thing is a daughter?
S: I could say the same thing. . .It's just the product of her mother's and father's love.

All responses of the subjects were categorized according to the six types of definitions. Every subject was scored for the highest level reached for each kin term. Inter-rater reliability was assessed by having a second judge rate all responses for one complete transcript from each age level. There was 93 percent agreement between the two raters. Differences that did occur were resolved through further discussion.

The results for this analysis are shown in Table 5.[1] Three analyses of variance (ANOVAs) were performed on these data.[2] The first ANOVA included two between factors (age group with five levels and sex of subject with two levels) and two within factors (category of kin term with six levels [1. *mother-father*; 2. *sister-brother*; 3. *daughter-son*; 4. *wife-husband*; 5. *grandmother-grandfather*; 6. *aunt-uncle*] and sex of kin term with two levels

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[1]   The reader will note that the frequencies of Levels O and I in the Level of Generality categorization scheme (Table 3) are not identical to the frequencies of Levels O and 1, respectively, in the categorization scheme used to assess subjects' Level of Definition (Table 5) despite close similarity of scoring procedures for the two schemes. The following explanation should help clarify the observed differences.

There are higher frequencies of Level O responses in the Level of Definition scheme than in the Level of Generality scheme. The area of discrepancy lies in the scoring of responses that included an indefinite article plus an alternate form of the kin term, as for example, in the response 'A mommy' to the question 'What is a mother?'. In the Level of Generality scheme, we decided to score such responses as General or Abstract (G), since we had made the related decision that a score of I (or instance-oriented) should be assigned to responses that included: (a) the kin term plus a pronoun (e.g., 'My mother'), (b) an alternate form of the kin term plus a pronoun (e.g., 'My mommy'), and (c) an alternate form of the kin term appearing alone (e.g., 'Mommy'). The latter three rules were also applied similarly and consistently in the scoring of responses according to the Level of Definition categorization scheme. More specifically, all such responses were also given an instance-oriented (in this case, Level 1) score. However, according to this scoring scheme, responses that included an indefinite article plus an alternate form of the kin term (e.g., 'A mommy') were assigned a score of O for incorrect or irrelevant since this type of response did not clearly apply to the other higher categories. This particular procedure was unlike that of the Level of Generality scheme, where, as mentioned, such responses were not scored as 'O' but rather were instead awarded a score of 'G'. These scoring rules resulted in slightly higher level O frequencies in the Level of Definition scheme than in the Level of Generality scheme.

In comparing the Level 1 (Definition) frequencies with the Level I (Generality) frequencies, the reader can see that the former responses are more numerous. This is due to cases where, for a particular kin term, the child provided an instance-oriented response in his/her discussion of the term in addition to providing a response that included an indefinite article plus an alternate form of the term (for example, saying 'A daddy' and 'My daddy' in response to the question 'What is a father?'). This type of response was awarded 1 point (for instance-oriented) when scored according to the Level of Definition scheme, as the previous explanation would indicate. However, in the Level of Generality scheme, this form of answer received a score of B for both an instance-oriented response ('My daddy') as well as a more general response ('A daddy') for the reasons cited earlier. This scoring practice resulted in a higher frequency of Level 1 than Level I responses.

[2]   Although ANOVA is not typically used with ranked data, a study by Hsu and Feldt (1969) indicates that such a method of analysis is warranted in the present case as there are enough (i.e., six) levels in the ranking scheme. Haviland & Clark (1974) had also used the ANOVA in the analysis of their results.

TABLE 5. *Percentage of responses categorized according to level of definition as a function of age*

Age	Level of definition					
	0	1	2	3	4	5
Three-year-olds	45.84	27.08	25.00	2.08	0.00	0.00
Four-year-olds	31.25	28.13	37.50	2.08	0.00	1.04
Five-year-olds	26.04	35.42	31.25	7.29	0.00	0.00
Six-year-olds	10.42	13.54	36.46	33.33	5.21	1.04
Adults	0.00	0.00	0.00	25.00	51.04	23.96

[1. female; 2. male]). There were significant main effects for age group and for category: the mean level of definition increased as subjects got older ($F(4,30)=51.18$, $P<0.01$), a finding which replicates earlier results of Danziger (1957), Elkind (1962), Haviland & Clark (1974) and Piaget (1928); and some terms were more difficult to define than others ($F(5,150)=4.85$, $P<0.01$), which replicates results of Danziger (1957) and Haviland & Clark (1974). There was no significant interaction between kin term and age group ($F(4,30)<1$,n.s.) indicating that the ordering of kin terms according to level of definition remained relatively stable as age increased (cf. Haviland & Clark, 1974). Also, as in the study of Haviland & Clark (1974) there was no significant interaction between sex of the subject and level of definition of the kin term ($F(5,150)=1.04$,n.s.) and neither sex of subject ($F(1,30)<1$,n.s.) nor sex of kin term ($F(1,30)<1$,n.s.) emerged as a main effect. Thus, males and females were not responding significantly differently in terms of mean level of definition and were not differentially responding according to sex of the kin term.

In a second ANOVA, therefore, sex of subject and sex of kin term were not treated leaving just two factors, the first being age group (a between subjects variable with five levels) and the second being kin term (a within subject variable with 12 levels). The results of this ANOVA were consistent with the first analysis. There was a significant main effect for age ($F(4,35)=55.96$, $P<0.01$) and for kin term ($F(11,385)<3.00$, $P<0.01$). The latter effect, therefore, showed that there was a significant difference among the mean levels of definition for all 12 terms, not just among the six matched-pairs (i.e., *mother-father* versus *sister-brother* etc.). For example, children provided the best definitions for the term *mother*, followed next by definitions for *father*. Other terms like *brother*, *sister*, and *grandfather*, tended to be easier to define than *grandmother* and *daughter*, which in turn were defined at a somewhat higher level than the terms *uncle*, *son*, *wife*, *husband*, and *aunt*. Also there was not a significant interaction between age and kin term ($F(44,385)=1.26$,n.s.).

A third ANOVA was done to ensure that a significant age effect occurred for the four groups of children only. Thus the factors in this ANOVA were identical to those of the second ANOVA except that the age factor included only four levels (3,4,5, and 6 years). Again, there was a significant main effect for age ($F(3,28)=10.29$, $P<0.01$) and for kin term ($F(11,308)=2.64$, $P<0.01$). Thus, mean level of definition increased with the age level of the children, and the children found some kin terms more difficult than others. Again there was no significant interaction between age group and kin term ($F(33,308)=1.2$,n.s.). Younger children found the same terms difficult as did older children.

As Table 5 indicates the definitions produced by three-year-olds were most frequently classified at Level 0, next most often at Level 1, and next most often at Level 2. Only about 2% of their definitions were classified at Level 3 and none at Levels 4 and 5. The definitions of the four- and five-year-olds were roughly equally divided among the first three levels, with very few being classified at higher levels. The modal type of definition for the six-year-olds was Level 2 and the next most frequent type was Level 3 with one third of their responses being classified in this way. Thus the six-year-olds were the only group of children who produced relational definitions with considerable frequency and none of the groups of children produced accurate relational definitions at all frequently. On the other hand all of the adults' definitions were relational and the majority of them were accurate. The most common type of response for the adults was Level 4 with slightly over half of their definitions being classified in this way. The remainder of their responses were roughly equally divided between Levels 3 and 5. (By definition all Level 4 responses were accurate. All but one of the responses produced by adults which were classified as Level 5, reciprocal definitions, were accurate as well.)

For the most part the developmental patterns indicated in Table 5 are consistent with the findings of other researchers. However, contrary to the assumptions of Piaget (1928) and Haviland & Clark (1974) adults did not produce Level 5 definitions (those which stated reciprocity) most often. Instead, the usual response produced by adults was classified as being in Level 4, an accurate definition, which was usually stated in terms of an ego reference point. To illustrate this difference adults would more commonly define the term *aunt* as something like 'A female who is your mother or father's sister' as opposed to a reciprocal definition like 'A female who has nieces or nephews'.

However, the most important findings of this study resulted from a series of analyses that involved estimates of order of acquisition. Following Haviland & Clark's (1974) procedure, we ranked the kin terms according to the mean level of response achieved by the children which was established

for each term and used the resulting rank order as an estimate of the order of acquisition of the terms. Table 6 summarizes the order of acquisition of the words determined in this way for this study.

TABLE 6.   *Mean level of definition for the twelve kin terms*

Kin terms	Mean level of definition
mother	1.66
father	1.59
brother	1.56
sister	1.53
grandfather	1.53
grandmother	1.34
daughter	1.28
uncle	1.19
son	1.09
wife	1.09
husband	1.09
aunt	0.94

In addition to the ranking for order of acquisition, the mean level of experiential ranking for the 12 kin terms was determined from the parental responses on the questionnaires. Twenty-four questionnaires out of the 32 that were sent to the parents of the children were returned and the means shown in Table 7 are based on these. Table 7 shows the rankings for each of the three questions asked as well as the average across the three rankings. These rankings seem consistent with what one might intuitively predict. For

TABLE 7.   *Mean level of experiential ranking for the twelve kin terms as determined by parental responses on the questionnaires*

	Question 1	Question 2	Question 3	X̄
mother	1.38	**1.63**	1.36	1.45
father	2.27	**2.13**	1.98	2.13
grandmother	5.15	**5.15**	4.52	4.94
sister	5.71	**5.38**	5.87	5.65
brother	5.77	**5.52**	6.04	5.78
grandfather	6.15	**6.19**	5.81	6.05
aunt	6.46	**6.90**	5.98	6.45
uncle	7.00	**6.98**	6.56	6.85
daughter	10.50	**9.10**	9.96	9.85
wife	10.50	**9.77**	9.33	- 9.87
son	10.50	**9.02**	10.13	9.88
husband	9.71	**10.08**	10.21	10.00

example, *mother* was ranked higher than *father*, and more generally, ex-periential rankings tended to be higher for kin terms representing members of the nuclear family than for those of the extended family. Also, relations less significant to the child (e.g. *wife*, *husband*) were consistently ranked very low.

Table 8 demonstrates the orderings that would result if the terms of this study were ranked according to the system suggested by Haviland & Clark (1974) (see Table 1). Since these researchers suggest an alternative ordering for the levels of semantic complexity, the ranking that would result from this revised scheme has been included in Table 8 and in all of the statistical analyses. In ranking the terms in Table 8 we have followed Haviland & Clark exactly except for our treatment of *husband* and *wife* which had not been included in the set of words studied by them (Haviland & Clark 1974). Since these terms are defined by one irreducible relational component ([X SPOUSE OF Y]) as well as sex-specifying property features ([MALE X] or [FEMALE X]) and redundancy rules they were classified into Level 1, entries with one relational component. In some of the analyses described below we have omitted *husband* and *wife* to see if our effects are maintained independent of these particular kin terms.

TABLE 8.   *Ranking of the twelve terms on the basis of semantic complexity*

Kin term	Original ordering	Alternative ordering
father	3.50	3.50
mother	3.50	3.50
son	3.50	3.50
daughter	3.50	3.50
husband	3.50	3.50
wife	3.50	3.50
grandmother	7.50	9.50
grandfather	7.50	9.50
brother	9.50	7.50
sister	9.50	7.50
uncle	11.50	11.50
aunt	11.50	11.50

To determine the relations between order of acquisition, experience, and semantic complexity, Spearman Rank Order Correlation Coefficients were computed. Correlations between order of acquisition and experience were significant for all three experiential ranking questions (see p. 47) that were answered by the parents (Question 1: $r=0.843$, $P<0.01$; Question 2: $r=0.884$, $P<0.01$; Question 3: $r=0.732$, $P<0.01$). Thus, the more ex-perience the children had with an instance of the term and the more the children had experienced the term itself, the earlier that term was acquired.

And, contrary to the semantic feature hypothesis, there was not a significant correlation between semantic complexity according to the two metrics of semantic complexity used by Haviland & Clark (1974) and order of acquisition (r=0.103, n.s. for metric 1; r=0.148, n.s. for metric 2). Also, neither metric of semantic complexity was significantly correlated with any of the experiential rankings based on the questionnaires.

Since the kin terms examined in this study were not identical to those of Haviland & Clark's (1974) study, it was felt that it would be important to compare the orderings for the 10 words which were common to both studies (*mother, father, brother, sister, grandfather, grandmother, daughter, son, uncle,* and *aunt*) in order to help to clarify the reason for the discrepancy between them.

It was found that there was not a fundamental failure to replicate Haviland & Clark's (1974) study, since a correlation between the order of acquisition of these ten words as determined by both studies was found to be significant (r=0.89, P<0.01). Thus, the ten common words were estimated to be acquired in approximately the same order by both studies. For these ten words, it was found that for Haviland & Clark's (1974) order of acquisition and both indices of complexity (i.e. initial and revised, respectively), the correlations were r=0.51, n.s. and r=0.61, P<0.01. Similarly, correlations between this study's order of acquisition for these ten words and the two indices of semantic complexity were: r=0.38, n.s., and r=0.45, n.s. However, for the three measures of experience (i.e. Questions 1, 2, and 3 respectively as described on p. 47) correlations with order of acquisition (determined from this study) were much higher: (r=0.81, P<0.01), (r=0.83, P<0.01), and (r=0.70, P<0.05). These results are highly consistent with the analyses described earlier.

Therefore, the differences in the findings between this study and Haviland & Clark's (1974) study cannot be attributed solely to the fact that the kin terms examined in them were not identical. The results of this second analysis favour experience over semantic complexity as a predictor of order of acquisition.

In addition, to test the role of complexity in kin term formation further, the kin terms were analysed according to a measure of cumulative complexity analogous to the measures of cumulative complexity which Roger Brown (1973) applied to grammatical morphemes. In this analysis a term is considered more complex than another only if it is defined by the same components defining the less complex term, plus one or more additional components. Bierwisch's (1970) analysis of kin terms into relational components which had been extended by Haviland & Clark (1974) was used for this purpose. The complete definitions for the terms *father, brother,* and *sister* serve as illustrations:

father: [X PARENT OF Y] [MALE X] <ADULT X> <ANIMATE X>
<ANIMATE Y>
brother: [X CHILD OF A] [A PARENT OF Y] [MALE X] <ADULT A>
<ANIMATE X> <ANIMATE Y> <ANIMATE A> where X≠Y
sister: [X CHILD OF A] [A PARENT OF Y] [FEMALE X] <ADULT A>
<ANIMATE X> <ANIMATE Y> <ANIMATE A> where X≠Y.

Now, in the cumulative complexity analysis *father* was considered less complex than *brother* since, disregarding differences in the way the dummy variables (X,Y,A) are represented, *father* is defined by a proper subset of the components defining *brother*. Notice, however, that *father* was not considered less complex than *sister* in the cumulative complexity analysis. It is defined by fewer components but these components are not a proper subset of the components defining *sister* since *father* is defined in part by [MALE X] whereas sister is not, but is instead defined in part by [FEMALE X]. Thus the number of predictions that are made by the cumulative complexity analysis is considerably smaller than the number of predictions made by the metrics of complexity considered earlier in this paper and by Haviland & Clark (1974). Specifically, on the assumption that a less complex term is

TABLE 9.   *Comparison of order of acquisition predictions made by cumulative complexity and experiential orderings*

Actual order of acquisition[a]	Cumulative complexity violations[b]	Experiential ordering violations[b]		
		Question 1	Question 2	Question 3
father before *grandfather*	0	0	0	0
mother before *grandmother*	0	0	0	0
brother before *uncle*	0	0	0	0
brother before *son*	1	0	0	0
uncle before *son*	1	0	0	0
sister before *daughter*	1	0	0	0
sister before *aunt*	0	0	0	0
daughter before *aunt*	0	1	1	1
father before *brother*	0	0	0	0
father before *uncle*	0	0	0	0
mother before *sister*	0	0	0	0
mother before *aunt*	0	0	0	0
grandfather before *uncle*	0	0	0	0
grandmother before *aunt*	0	0	0	0

[a] *the fourteen relationships outlined are those which can be assessed by the method of cumulative complexity*

[b] *violations are determined by comparing the predictions of either cumulative complexity or experiential ordering to actual order of acquisition*

acquired before a more complex term, the cumulative complexity analysis allowed us to make 14 predictions which were that: (1) *father* would be acquired before *grandfather*; (2) *mother* before *grandmother*; (3) *brother* before *uncle*; (4) *son* before *brother*; (5) *son* before *uncle*; (6) *daughter* before *sister*; (7) *sister* before *aunt*; (8) *daughter* before *aunt*; (9) *father* before *brother*; (10) *father* before *uncle*; (11) *mother* before *sister*; (12) *mother* before *aunt*; (13) *grandfather* before *uncle*; and (14) *grandmother* before *aunt*. It should be noted that these predictions are not entirely independent of one another.

These cumulative complexity predictions and the corresponding predictions that could be made by our three experiential rankings were compared with the actual order of acquisition for the 14 pairs of terms. Table 9 shows the number of times the order of acquisition of the pairs of terms suggested by this study violated the predictions made by the cumulative complexity analysis and by the experiential rankings. The results presented in Table 9 indicate that cumulative complexity predicts correctly in 11/14 cases and experience predicts correctly in 13/14 cases. The latter finding was true for all three measures of experience. Thus, the predictive power of experience is slightly better than that of cumulative complexity, and in addition, the former is less restricted in terms of the number of predictions potentially made.

DISCUSSION

The following conclusions can be drawn from this study: (1) When attempting to define and describe kin terms younger preschool children often simply mention particular individuals or refer to personal experience without mention of any general class; increasingly with age and especially by adulthood the terms are defined in a more general way and increasingly superordinate terms are mentioned. (2) The tendency to produce relational definitions of the kin terms becomes increasingly frequent with development. Preschoolers rarely define the terms in a relational way, six-year-olds only sometimes do (in this study about a third of the time), and adults virtually always do. (3) Adults do not usually define the terms with reciprocal definitions, although they sometimes do; considerably more common for adults are accurate relational definitions in terms of an ego-reference point. (4) The quality of definition for children of a particular age level varies with the particular kin term being defined. (5) This study suggests that the quality of definition and the order of acquisition of kin terms are better predicted by experience than by metrics of semantic complexity, although both factors may be of some importance.

The finding that adults tend not to define the terms with reciprocal

definitions has relevance for theories of conceptual and semantic development and to debates about the psychological validity of componential analyses of kin terms. Formerly it was believed that the semantic/conceptual development of kin terms moved toward reciprocity. However, previous studies had not actually included tests of adults. This study suggests that reciprocity may not always be the crucial 'end-point' of development. Rather, accurate definitions in terms of an ego reference point are more common. This point should perhaps not be exaggerated since even though adults did not most often respond in our task in terms of reciprocity, it seems likely that they did appreciate the reciprocal nature of these terms (e.g., that an aunt has nieces and nephews). However, apparently reciprocity was *not usually central enough* to their conceptions of kin terms for them to mention it in their definitions of them. In turn our findings suggest that componential analyses of kin terms such as that of Wallace & Atkins (1960) which emphasize the ego reference point vs. reciprocity may be psychologically the most valid, at least insofar as the development of definitions of kin terms is concerned.

The finding that experience was predictive of order of acquisition of the kin terms is not consistent with the results of Haviland & Clark (1974). This contradiction does not appear to be due solely to the differences in the words examined in the two studies. One possible partial reason for the conflicting results may be the differences in the methods of assessing experience in the two studies: the present study required parents to rank the twelve kin terms according to three indices of experience while Haviland & Clark (1974) required parents to rate the kin terms on a four point scale, outlined below.

> 1, does not have a relative of this type; 2, has such a relative but has never seen him/her; 3, has such a relative and sees him/her infrequently; 4, has such a relative and sees him/her often. (Haviland & Clark 1974: 42).

Perhaps this scale method did not allow parents to make as accurate discriminations among kin as was possible with the ranking system. As an example, some children may have many relatives whom they see often; perhaps their mother, father, brothers, sisters, aunts, uncles, and grandparents. However, the rating scale does not allow parents to show the relative amount of time spent with such kin, all of whom would be seen often, while the ranking scheme does. A further benefit of the method used to assess experience in the present study is that it allowed parents to rank the terms on the basis of the estimated relative frequency with which children may have learned about their kin through discussion. Chambers & Tavuchis (1976) indicate this may be an important method of information transfer regarding kin terms. (We must acknowledge, however, that our method of assessing experience does rely heavily upon adult memory and is therefore

susceptible to potential difficulties associated with inadequate retrieval and possible misconstrual. Though parents may be able to provide relatively valid rankings in terms of time spent with kin relations, their judgments of linguistic experience with kin words, a more difficult task, may be subject to greater inaccuracies. It would therefore be beneficial for future research to explore alternative means of obtaining experiential measures that go beyond parental reporting.)

Why the two measures of semantic complexity derived by Haviland & Clark (1974) from Bierwisch's (1970) system of relational components failed to predict the order of acquisition of the kin terms in this study whereas it did in Haviland & Clark's (1974) study is more of a puzzle. At first we thought the discrepancy might be the result of our having included the kin terms *husband* and *wife* in our study which were omitted in Haviland & Clark's (1974) investigation. Relative to other terms children did not define these terms well even though they are relatively simple semantically, presumably because they had little experience with these relations or the terms which name them. However, when we omitted these terms from our analyses we still found that our experiential rankings were each significantly predictive of the order of acquisition of the terms whereas semantic complexity was not. The crucial terms here proved to be *daughter* and *son*. These were estimated to be acquired relatively late (seventh and ninth in the list of ten words) even though within Bierwisch's system they are of the simplest type. Thus their relatively late acquisition was inconsistent with the complexity hypothesis but was consistent with the experiential rankings produced by the parents of the children. According to Haviland & Clark's (1974) data for these ten words *daughter* and *son* were acquired not quite so late (*daughter* was fifth and *son* was tied for sixth). When correlations were computed between the order of acquisition for these ten words based on Haviland & Clark's data and the two measures of semantic complexity it was found that their original metric of complexity was not significantly predictive of order of acquisition but that their revised metric of semantic complexity was.

For our data the only definition of complexity that predicted somewhat well the order of acquisition of some of the kin terms was the measure of cumulative complexity (see Results). This measure predicted correctly in eleven of the fourteen not entirely independent cases for which cumulative complexity made predictions. However, each of the measures of experience did even better, predicting correctly in 13 of these 14 cases. Thus even cumulative complexity did not predict quite as well as experience, and the former is considerably more restricted than the latter in terms of the predictions potentially made. Moreover, one can think of cases not tested by the present study where the cumulative complexity measure would probably fail to predict order of acquisition successfully. As Miller & Johnson-Laird

(1976) have pointed out, for each pair of terms marked for sex within the nuclear family there is also a term that is not marked for sex. Thus, in addition to *mother* and *father* there is the term *parent*; corresponding to *brother* and *sister* there is the term *sibling*; as well as *husband* and *wife* there is the term *spouse*; and the sexless term for *son* and *daughter* is *child*. Although we have not interviewed children regarding their understanding of these sexless terms, we would hazard a guess that *sibling* is acquired after *brother* or *sister*, *spouse* after *husband* or *wife*, and *parent* after *mother* or *father* by many children. But cumulative complexity would generate the opposite predictions since the sexless term is simpler (defined by one less component, the sex marker) in each of these cases. If we are right about this, cumulative complexity will not always predict the order of acquisition of kin terms correctly which of course our own data suggest in three of fourteen cases.

In this paper we are not arguing that experience is the sole determinant of semantic development and the acquisition of word concepts. Complexity, among other factors, may contribute to semantic development for some semantic fields as it appears to in the case of grammatical development (Brown 1973). However, this study suggests experience and relevance predict the child's knowledge of kin terms well and in fact for our data provide more accurate predictions than does semantic complexity. It is interesting to note that, subsequent to the study by Haviland & Clark (1974), Eve Clark (1979, 1983) has acknowledged the role played by parental naming practices and other experiential factors in influencing vocabulary acquisition as well as the roles played by complexity and non-linguistic behavioural strategies. However, Clark (1979) maintains still that kin terms are a domain 'where semantic complexity appears to be a major determinant of order of acquisition' (p. 156; see also Clark 1983: 812). Our study raises questions about this appraisal and suggests that a more important determinant of the order of acquisition of kin terms may be the child's experience with such terms and the concepts they encode.

In conclusion, this study has implications for future research on semantic development, three of which we shall mention here. (1) First, with respect to future studies of the acquisition of kin terms, componential analyses of these words which incorporate the ego reference point should be considered since this investigation suggests that such analyses may be among the most valid psychologically. (2) Second, with respect to the study of semantic development more generally, it should be recognized that semantic complexity may not be the only or necessarily the most influential factor affecting the order of acquisition of words. (3) Finally, among the other factors that may influence semantic and vocabulary development, this study suggests that future research should focus on the importance of the child's personal

experience in affecting the words he or she learns and the concepts encoded by them.

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