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Is a father a daddy? A developmental study of children's definitions of parental kinship terms

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IS A FATHER A DADDY?
A DEVELOPMENTAL STUDY OF CHILDREN'S DEFINITIONS OF PARENTAL KINSHIP TERMS

by

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Abstract

IS A FATHER A DADDY?
A DEVELOPMENTAL STUDY OF CHILDREN'S DEFINITIONS OF PARENTAL KINSHIP TERMS

by

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This study explores the effects of developmental, ontological and metalinguistic factors on children's abilities to define words in three different domains--kinship terms, manufactured kind terms and natural kind terms. Within the domain of kinship, it explores possible differences in definitions of terms of address (mommy/ daddy) vs terms of reference (mother/father). In the two other domains (manufactured and natural kinds), words which are assumed to be synonyms are compared to determine whether they elicit different representations and therefore different types of definitions.

Sixty-seven children (21 kindergarteners, 26 third-graders and 20 sixth graders) were interviewed on two separate ocassions approximately one month apart and asked to define 15 words in the three domains (6 kinship, four manufactured, and 5 natural kinds). The lists of words were alternated so that each subject defined the parental terms of address in one interview and the parental terms of reference. The 'synonyms' were alternated in the same manner.

It was predicted that the kindergartners would produce mainly functional definitions, without the Aristotelian (An X ISA Y) format, regardless of domain or condition, while the older subjects, who would possess greater metalinguistic awareness, as well as the benefit of several years of schooling, would distinguish between terms of address and terms of reference, and would produce a greater proportion of definitions which demonstrated hierarchical organization.

As predicted there was a significant main effect for grade for all measures. There was also a significant wordtype interaction, with the two younger groups producing significantly greater percentages of functional definitions for the manufactured terms than for either the kinship or natural kind terms. There was also an address/reference distinction--the terms of address (daddy/mommy) were more likely to be defined in biological terms than the terms of reference.

The results of this research led to the general conclusion that in addition to age differences in conceptual knowledge, metalinguistic knowledge and the ontology of the word affect children's ability to give verbal definitions.

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CHAPTER I

INTRODUCTION

Over the years researchers have questioned the feasibility of attributing the acquisition of concepts in all domains to the same mechanisms and/or processes (Vygotsky, 1962; Gelman and Spelke, 1981; Glick, 1978). While Vygotsky differentiates between the acquisition of 'natural' and 'scientific' concepts, Gelman and Spelke suggested the possibility that human beings use different processes in the acquisition of concepts of animate and inanimate objects. Even if the same processes and mechanisms are responsible for acquisition in all domains, as Piaget suggested, it may be that conceptual activity in the different domains occurs at different rates and/or times during the course of cognitive development (Miller and Johnson-Laird, 1976; Nelson, 1985). The research reported here explores possible differences in children's definitions of words in various domains, but focuses primarily on their definitions of kinship terms.

Concepts and Definitions

Much of the concept development literature has relied heavily on verbal definitions; however, as Clark (1983) notes, this practice tends to conflate the concept of an object with the lexical definition of the word which refers to it. Nelson (1974b, 1977a, 1977b, 1978a, 1978b, 1982, 1983, 1985) put forth a theory which, in part, attempts to separate the process of acquiring a concept ("a single cognitive unit

that can be manipulated as though it were a mental object" (Nelson, 1985, p. 72) from that of acquiring lexical definitions. The acquisition of a concept is the result of a cognitive process, while acquiring a definition, which includes heirarchical classification is a linguistic process (Nelson, 1985; Benelli, Arcuri, and Marchesini, 1988). Knowing what something 'is' and being able to define it verbally require different types of abilities.

Watson (1985) notes several characteristics of definitions:

> 1) Definitions have a conventional linguistic form.
> 2) Definitions are conventional (rather than 'true') word meanings.
> 3) Definitions are <u>metalinguistic</u> in nature, deriving from reflection upon the properties and uses of language... [a definition] specifies some relation that may obtain among words in the lexicon or between lexicons.
> 4) Definitions represent explicit expressions of word meanings that remain largely implicit in oral language (p. 184-185).

It is apparent that factors such as the nature of the question--What is an X? vs What kind of thing is an X? vs Tell me everything you know about an X--affect the quality of children's definitions (Anglin, 1977; Nelson, 1978; Watson, 1985). Markman and her colleagues also found that the nature of the domain--collections vs classes--also influences children's abilities give definitions (Markman, 1981; Markman, Horton, & Mclanahan, 1980). Literacy level, as well as cognitive developmental level, may also affect a person's

ability to give a 'good' definition (Cole and Scribner, 1974; Scribner and Cole, 1973, 1981).

Proper definitions require a certain structural syntactic format--the ISA relationship--for which a prerequisite appears to be superordination, generally accepted as an indication of mastery of logical class inclusion. However, metalinguistic awareness has been found to be a more important determinant of superordination than logical class inclusion (Litowitz, 1976; Saywitz and Wilkinson, 1982; Benelli et.al., 1988).

Contextual factors (objective, subjective and cognitive) also affect verbal definitions. Among the objective contexts Nelson (1985) includes: physical, cultural, social, activity, agenda, affective, communicative act, action, and specific linguistic contexts. Ogden and Richards (1923, cited in Lyons, 1977) differentiated between cognitive and affective meaning, giving a an example the difference betwen horse and steed. In other words, different labels which refer to the same referent (and which are generally accepted as synonyms) may evoke different representations, as well as different types of definitions. Nelson (1978) found that among three- and four-year olds:

> When the term to be defined is an action or function [e.g., drive], it elicits people, places, and things that are related through that action or function to the self. When the term to be defined, however, is an object or object category, the functional aspect of the relation is central and the people, places, and things are peripheral. To put it in semantic terms, the relational term elicits its main arguments, while the nouns, in turn, elicit a major relation and through that relation its further arguments. (p.170).

Kinship Terms

Kinship terms have been of interest to psychologists, as well as anthropologists over the years. While developmental psychologists have focused on the development of the meanings of the various terms (i.e. Piaget, 1928), cultural anthropologists have focused on their usage within certain cultures (Wallace and Atkins, 1966), and the universality (Scheffler, 1976) or relativity (Schneider, 1972) of their meanings. Psychologists usually examine kinship terms under the general topic of relational terms, and for Piaget in particular, they were included in his global examination of the development of logical structures. However, it is possible that the nature of kinship makes the process of acquiring conceptual knowledge of the terms, as well as that of defining them, different from those utilized in other domains.

If we acquire natural and scientific terms differently (Vygotsky, 1962), acquire terms for animates and inanimates differently (Gelman and Spelke, 1981), have cognitive and affective meanings for the same referent, and must possess metalinguistic awareness to 'make a definition,' it seems clear that defining any word must be a difficult task for an adult, much less a child. Verbalizing kinship relationships must be even more complex, because in addition to the other requirements, " ... the child ... has to learn many new social facts about the roles played by different people before

he can find out what a particular kinship relation means" (Clark, 1973, p. 107).

This research examines children's definitions of words in three different domains--natural kinds, manufactured kinds (artifacts), and kinship terms, with particular attention to their definitions of parental kinship terms.

Conceptual and Semantic Development

Over the years psychologists have been interested in ascertaining the developmental path of children's concepts. Once a child is verbal, the most popular way of accessing his/her conceptual knowledge has been to ask the child to define certain words. However, there is a gap between comprehension and production, particularly among younger language learners; therefore the definition that the child gives verbally will not necessarily reflect his complete understanding of a given concept.

That children have concepts before they have labels for them is generally accepted. While there is concensus that children's concepts may be different from adults' there is some disagreement as to the nature of those differences. If Piaget's sensorimotor schemas are considered as the basis for concept acquisition, the child's concepts would differ from the adults' just on the basis of the adults' opportunity to acquire a much greater store of knowledge. Piaget would argue that children's initial schemas do not qualify as true concepts. Implicit in his theory is the equating of 'concept' with 'sign,' as opposed to symbol. Since for Piaget a symbol

is idiosyncratic while a sign is socially agreed upon, a pre-concept does not become a concept until it meets adult standards (Piaget, 1962). This line of reasoning leads to the conclusion that concepts are stable once acquired at the concrete operational stage.

The stability of concepts has also been an area of disagreement among researchers. Smith and Medin (1981) see belief in the stability of concepts as "view dependent" and closely related to the classical view, which assumes, among other things, that "the features that represent a concept are (1) singly necessary and (2) jointly sufficient to define that concept" (p. 23). In other words, every instance of the concept must have the features and every entity having that set of features must be an instance of the concept.

The classical view of concepts lends itself to componential analyses. Attempts have been made to use the results of these analyses to predict order of acquisition (e.g., Clark, 1973; Haviland and Clark, 1974; Gentner, 1975, 1978, 1982). Based on this model, some researchers propose that the difference between children's and adults' concepts rests on the feature by feature (semantic component) acquisition which is incomplete in the child (Clark, 1973; Gentner, 1978, 1982; Huttenlocher & Lui, 1979). While Gentner (1975) presents 'evidence for the psychological reality of semantic components', Fodor, Fodor and Garrett (1975) argue for the 'psychological unreality of semantic representations.'

Eleanor Rosch put forth a theory in which she contended that "most 'real' categories are highly structured internally and do not have well defined boundaries; thus we may presently have a quite distorted view of how real categories are learned and how they function in cognitive processes" (Rosch, 1973, p.112). According to this model perceptual categories (e.g., color and form) have categorical structures which are universal across languages and the core meanings of these categories are 'given' in the human perceptual system. These core meanings are represented by prototypes, or best (most typical) examples of the category, which are at the center of the concept, with variations at distances from the core proportionate to their degree of 'family resemblance' to the prototype. The more peripheral a member of the category is--the more difficult it would be to categorize because of the fuzziness of the boundaries of the category. Rosch further asserted that this model may also be applicable to semantic categories. She further suggested the possibility that "children initially define a category by means of its concrete 'clear cases' rather than in terms of abstract criterial attributes" (Rosch, 1973, p. 142).

Prototype theories such as Rosch's have gained wide acceptance, but there are those who do not think that prototype theory is adequate to explain the nature of conceptual organization in all domains. For example, Osherson and Smith (1981) claim that while prototype theories may be adequate for "'kind' term concepts, i.e., animal, clothing,

trees, etc.," they may not be applicable to 'conceptual combinations' in which "relatively complex concepts are forged out of relatively simple ones" (p. 36). Their claim is that prototype theories may be useful for 'identification,' but not for the conceptual core. Keil and Batterman (1984) present evidence for a shift from concepts based on characteristic features to concepts based on defining features. Many theorists accept the coexistence, psychological reality and usefulness of both 'conceptual core' and prototypical representations, at least for some concepts (Wittgenstein, 1958; Landau, 1982; Keil and Batterman, 1984).

An example of this conclusion from research on kinship terms is Landau's (1982) study in which she interviewed 60 white middle-class children (aged 5 to 10) and adults. Her materials consisted of four picture sets repesenting five female kinship terms (mother, sister, daughter, grandmother, and granddaughter) with combinations of the presence or absence of age and reciprocal kin. Following the Roschean model, the subjects were first asked to rank-order the pictures as exemplars of the various kin terms; they were then asked to justify their choices. As expected, her results indicated that younger children showed preference for the 'typical age alone' pictures while older children and adults prefered the 'reciprocal kin alone' pictures. However, they all agreed that the pictures representing typical age and reciprocal kin were the best exemplars of the kin term. Most importantly, she found that even the young subjects who made

their selections based on symptoms rather than criteria were able to verbalize their justifications based on defining criteria. In other words, there was a task bias independent of age.

Landau concluded that both symptomatic and criterial representations were available to all subjects (albeit to varying degrees), depending on the task. She suggested some possible explanations for the developmental trends--young children's inability to represent criteria or lack of "specific information needed to appreciate the relevant biological relationships" (p. 61). Another possibility is that the young children develop "a new appreciation for the task-relevance of different aspects of his knowledge" (ibid.). Mervis (1981) found that very young children form different basic level concepts than adults from the same basic level terms. She suggested that differences between adult and child basic level concepts may be due to 1) lack of information, 2) adult-child differences in which attributes they consider salient, or 3) overextension by the child based on the erroneous inclusion of irrelevant attributes in his/her intension of the concept.

The majority of the research on conceptual and semantic development focuses of the adult-child differences and the deficits of the children. But there may also be inherent differences between domains which contribute to the variation. While taxonomic classification is usually considered the highest level of both conceptual and definitional

organization, Wierzbicka (1984) argues that there are other classification principles that may play a more important role in certain areas of the lexicon. Wierzbicka agrees with Rosch (1978) that 'basic concepts' stand for things that have perceptual characteristics and can therefore be imagined (and drawn), but she also believes that they can be imagined because they are truly taxonomic. She argues further that what enables certain objects to be imagined is not their psychological salience, but the fact that they stand for 'kinds of things' (p. 317).

Wierzbicka concludes that while we categorize the basic level concepts in our biological environment into higher level taxonomic concepts (superkinds) "With respect to the manufactured environment, we proceed differently--we group kinds of things into supercategories on a different basis. We no longer ask, What kind of thing is it?; rather, we ask, What is it for? How can one use it? Where does it come from? Why is it there?" (p. 325).

According to Nelson, a possible explanation for children's failure to use superordinate terms is the fact that their categorical or collective structures are spatiotemporally derived from representations of the real world and have not yet become established as semantic structures. Additionally, it is only as semantic structures that hierarchical relations between words are established (Nelson, 1985, p. 158). Moreover, the categories that each

culture or linguistic community chooses to name are somewhat arbitrary. In some cases, though, children do use superordinate level terms, but as same-level synonyms of basic level terms.

While the research reviewed varies in many aspects, there are several notions that tie the pieces together. Firstly, many of the researchers entertain the possibility of dual, if not, multi-representational systems. Additionally, they suggest that while young children's concepts may initially not be based on criterial features of objects, once they do begin to utilize these features, they do not stop drawing on the symptomatic aspects of their concepts--adults, as well as children, seem to retain at least two types of conceptual organization.

Based on these proposals, it seems that the child must acquire the sense aspect of meaning before s/he is able to use taxonomic categorization effectively, since sense represents the relationship that holds between words. This also means that the word is instrumental in organizing the concept (a notion similar to Vygotsky's [1962] explanation of the acquisition of scientific concepts) and that metalinguistic awareness is necessary to be able to express those relations. It seems then, that if more than one system is available to the older child, once meta- linguistic awareness is acquired, the child should possess the capabilities to verbalize knowledge based on all of them, provided the proper context is provided.

One of the objectives of this research is to investigate whether metalinguistic awareness, as well as the nature of the word itself, may be determinants of the way that the child defines it. For example, will the child give different types of definitions for words that are 'natural kinds,' 'manufactured kinds,' and 'social objects.' Additionally, since kinship terms are considered to have classical criterial definitions in that the features (i.e., sex and age) appear to be independent (Smith and Medin, 1981; Landau, 1982), will there be intra-subject variation in the way the child defines kinship terms as opposed to her/his definitions of words in the other categories?

Metalinguistic Awareness and Definition

The lack of metalinguistic awareness has often been cited as the underlying problem in young children's failure on many verbal tasks, (Benelli, Arcuri, and Marchesini, 1988; Markman, 1976). Benelli et.al. (1988) define metalinguistic knowledge as "awareness of the nature, uses, functions and rules of language," after Tunmer, Pratt and Herriman (1984). Others have defined it as a controlled process (Hakes, 1982) that divorces language from its context and treats it as opaque (something to be focused on) (Cazden, 1972).

Some researchers consider metalinguistic awareness a unitary acquisition (de Villiers & de Villiers, 1974), while others consider it an orderly acquisition of many separate, but coordinated skills (e.g., Clark, 1978; Saywitz and Wilkinson (1982); Cazden (1974). Much of the research in the

area of metalinguistic ability has been confined to one or another aspects of it, with the results taken to indicate mastery of the totality of such awareness (Saywitz and Wilkinson, 1982). They suggest further that "the development of metalinguistic awareness may begin as early as 2 years; however, full awareness is found only in the 7 to 8 year old who can repeatedly demonstrate awareness of many linguistic activities" (p. 247).

Although there is no empirical evidence linking metalinguistic awareness to other 'meta-' capacities, they all seem to emerge between the ages of 5 and 7. Sachs and Devin (1976) and Shatz and Gelman (1973) have certainly demonstrated that the skills required for certain 'inexplicit' aspects of metalinguistic awareness (i.e., adjusting one's speech to the listener) develop at a very early age. Giving a definition, on the other hand, which is considered an 'explicit' metalinguistic skill, is a fairly late development.

Vygotsky (1962) states that the acquisition of spontaneous (natural) concepts and the acquisition of scientific concepts, while closely connected, develop in reverse directions--spontaneous concepts develop from the bottom up while scientific concepts develop from the top down. A similar notion was been explored by Gelman, Collman & Maccoby (1986) who found that 4- to 7-year olds were better able to infer properties from knowledge of category membership (top-down) than they could infer category membership from properties (bottom up), in spite of conflicting perceptual

cues. "The inception of a spontaneous concept can usually be traced to the face-to-face meeting with a concrete situation, while a scientific concept involves from the first a 'mediated' attitude toward its object" (Vygotsky, 1962, p.108).

Vygotsky stated further that while a child may have a spontaneous concept, his metacognitive awareness of this concept, including the ability to define it in words, will be acquired relatively late compared to his metacognition of scientific concepts. "He has the concept (i.e., knows the object to which the concept refers), but is not conscious of his own act of thought. The development of a scientific concept on the other hand usually begins with its verbal definition and its use in non-spontaneous operations--with working on the concept itself." (Vygotsky, 1962, p.108).

Litowitz (1977) discussed the problems that children encounter in 'learning to make definitions.' When we ask a child to define a word, we are asking for two types of performances:

> Firstly, we are asking for a verbal statement, that is, words in a certain ordered form. . . . Secondly, we are asking for a verbal statement which passes information in a very particular sense. . . . Therefore we are asking for an abstraction from the individual's experiencing of a lexical item in terms of (1) class inclusion or membership and (2) salient attributes or properties (Litowitz, p. 293).

Litowitz suggests that the difficulty that researchers experience in eliciting Aristotelian definitions from children might be related to the 'shallowness of their taxonomies,'

because a child "must learn the highest, non-specific [superordinate] level of 'something' before he can fill in the various taxonomies" (p. 298). There is also the possibility that the child has the necessary depth of taxonomy, but has not yet learned the proper communicative strategy required in giving a definition.

That young children give functional definitions has been well documented (Al-Issa, 1969; Anglin, 1970, 1977; Nelson, 1977, 1978, 1983, 1985). The emergence of superordinate categorization has been taken as a sign of definitional maturity. However, adults also give functional, as well as taxonomic definitions, depending on such factors as discourse context and semantic domain. This also seems to be the case with young children.

For Watson (1985) the acquisition of a formal definitional format results from the adoption of a literate register which is learned through formal schooling and similar scholarly activities. It is also somewhat removed from the pragmatic functions of language. Like Vygotsky (1962, 1978) Watson stresses the importance of the teacher and the acquisition of 'teacher talk.' The increase in scholarly activity, according to Watson, also leads to an increase in the use of reference books such as dictionaries, which consequently shape the structure of 'explicit expressions of word meaning.'

Watson sees the function of literate register definitions as threefold: explicative, in that it "renders explicit the

implicit meanings underlying the use of words in ordinary discourse;" epistemic, in that "once the meaning is explicit, it can be analysed and revised;" and stipulative (constitutive), in that it "can be used to stipulate new meanings for the purpose of rational enquiry, as in mathematical or philosophical statements ...." (Watson, 1985, p. 194). Watson's functional taxonomy of definition is quite similar to Nelson's notion that meaning progresses from reference to denotation to sense. Watson's taxonomy, however, has four levels, as shown below:

A functional taxonomy of definition

Type of Definition	Function	Direction of Fit
1. Ostensive (+labelling,etc.)	Semanticity established	Word<------->World
2. Lexical-semantic	Semanticity made explicit	Word-->Def<-->World
3. Lexical-epistemic	Semanticity revised	Word<->Def<->World
4. Stipulative	Semanticity created	Word->Def->Possible World

(Adapted from Watson, 1985.)

Although Nelson (1985) was referring to meaning in her sequence, and Watson is refering to definition, there are certainly some similarities. Both begin with the relationship between the word and the world, but while Nelson's final step is sense, Watson's final step is the stipulative function of definition which is depicted as a dynamic relationship between word, definition, and possible worlds. In both cases, the final step is the decontextualization of the word. However, Nelson states: "Words are only decontexted in dictionaries.

The notion that words become decontexted in the course of development can mean only that they can be extended from their original context of use and be given an interpretation in a number of different contexts--eventually in all possible contexts" (Nelson, 1985, p. 60).

Most of the researchers mentioned in this review put a great deal of stock in the influence of formal education on the development of metalinguistic abilities. Scribner and Cole (1981) made a further distinction between literacy and schooling. In their estimation, literacy per se does not foster such skills as taxonomic classification, whereas schooling does. As Vygotsky notes, children are able to make deliberate use of scientific concepts more easily than spontaneous concepts because ". . . the teacher, working with the pupil, has explained, supplied information, questioned, corrected, and made the pupil explain." (Vygostky, 1962, p. 107). This process is hardly relevant to learning relations. Moreover, kinship terms are not really taught, except perhaps in introducing children to distant relatives, (geographically, as well as genealogically). In that situation the explanation might be very similar to being taught a scientific concept.

It appears that kinship terms for close relatives, i.e., father or mother, are either learned like spontaneous concepts or as labels much like proper names. Therefore, while the information may be available to the child, learning to express kinship terms in the literate register requires the same

'scholarly activities' as defining any other word, regardless of one's conceptual or lexical knowledge of the domain.

The Meaning of Kinship Terms

The possibility of developing a general theory of meaning has been argued by philosophers (Quine, 1960; Kripke, 1977; Putnam, 1975), linguists (Chomsky, 1975; Lyons, 1977) and psychologists (Clark, 1983). There seems to be disagreement as to what is meant by 'meaning.' Ogden and Richards (1923, cited in Lyons, 1977) even draw a distinction between the meaning of the noun 'meaning' and the verb 'to mean.' Each of these lexemes has various meanings (or senses), including intent, significance, value, reference, and so on. "The nature of these similarities and differences, however, is, to say the least, elusive and may vary considerably with the circumstances in which the sentences might be appropriately uttered" (In Lyons, 1977, p.3).

A recurring question in the discussion of meaning has been whether there are inherent meanings in words (signs) or whether meaning is relative to the situation or culture in which they are being used--"Do words mean or do people mean?" (Nelson, p.8). In Nelson's estimation, both words and people mean. She (Nelson, (1985) proposes that while there are necessarily conventional meanings for words which facilitate communication within a language community, ". . . individual speakers may use words in such a way as to convey different meanings on different occasions of use, depending upon

intentions and discourse context" (p.8). She suggests three different kinds of meaning: "subjective meaning, established within the individual's meaning system as a whole; shared meaning, established between two or more speakers within a given context; and objective meaning, a repository of the culture" (p.11)--individual, social, and cultural meaning, respectively. Just as the meaning of 'meaning' appears elusive, so does the meaning of many words and kinship terms are no exception.

Kinship Terms as Labels

Common nouns are generally assumed to have meaning apart from their referents; but there are those who believe that proper names do not 'mean' anything but are just labels for particular individuals (Greenberg and Kuczaj, 1982; John Stewart Mill, 1843, cited in Miller & Johnson-Laird, 1976). The contention is that proper nouns involve reference but not meaning. Miller and Johnson describe proper names as labels 'par excellence.'

Greenberg and Kuczaj (1982) distinguish between the object concepts needed for reference with common nouns and those needed for proper nouns. They cite Russell's explication of why proper nouns involve reference but not meaning:

> Reference with proper nouns entails object concepts that permit one to recognize various instances of an object as instances of the same object, whereas reference with common nouns involves object concepts that provide the basis for the decision that a particular object is an instance of a particular

> class of objects. In reference involving proper nouns, the crucial relation is that of identity--that is, deciding whether an object *is* a particular object. In reference involving common nouns, the crucial relation is one of *extension* or *inclusion* --that is, deciding whether an object is a member of a particular class of objects" (Russell, 1919, cited in Greenberg and Kuczaj, 1982, p. 277).

As Miller and Johnson-Laird (1976) point out, that then leaves the child with the formidable task of deciding which lexemes label individuals and which label classes of individuals. However, it does not take long for children to become sensitive to other linguistic (i.e., syntactic) signals to help them draw this distinction. For example, Katz, Baker, and Macnamara (1974) found that before the age of two children realize that the absence of an article signaled a proper name. As a matter of fact, female subjects were sensitive to the distinction by the age of seventeen months.

Kinship terms have been grouped with proper names in that they do not require conceptual knowledge of the referent (Miller and Johnson-Laird, 1976; Greenberg and Kuczaj, 1982; Nelson, 1985). We must consider, however the fact that persons can be labelled generically (doctor, spinster, etc.) as well as individually (i.e., by proper names).

Following these lines, unless one addresses one's male genitor as "Father," the word 'father' could be viewed as a common noun denoting that generic class of people. "Daddy," on the other hand, which appears to be a more common term of address in American English, might be viewed as a proper

noun much like a name. Therefore, if, as Russell proposed, the crucial relation in reference with common nouns is one of extension or inclusion the word 'father' should elicit heirarchical definition. On the other hand the word 'Daddy' should elicit a more experientially bound script-based definition, because the referent would be a particular person, rather than a class of people.

Terms of Address vs Terms of Reference

Anthropologists have traditionally distinguished between address and reference in the use of kinship terminology. Like proper names, kinship terms also have the referential function (as terms of reference) and the vocative function (as terms of address) (Lyons, 1977, p. 217).

One apparent difference between the use of proper names and the use of kinship terms is that, in most cases, the same proper name serves the vocative and the referential functions. This is only the case with some kinship terms. For example, one may use the parental kinship terms without a proper name since these particular kinship terms usually only have one referent. However, very seldom does one use such terms as 'cousin' or 'uncle' without adding a proper name, because it is quite probable that more than one person shares the same relationship with the addresser.[1]

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[1] It should be noted, however, that among many Southern American blacks 'Sister' and 'Brother' are used alone for address as well as reference when there is only one such relationship in the family; when there is more than one brother or sister those terms are reserved for the oldest sibling of each gender.

Terms of address share some properties with proper names and personal pronouns in that they all serve a deictic function, that is, they are dependent on the discourse context. As Bean (1975) puts it, deixis indicates an "existential relationship between an object and the situation of utterance. . ." (p. 313). An understanding of kinship terms consists not only of knowledge of the system of reference, but also of the "deictic system of address" (Carter, 1982, p. 179).

> Deictic terms are of particular interest because they quintessentially represent relations between language terms and pragmatic conditions in the world, rather than world-world or word-word relationships. That children do appear to master at least some of these shifting relationships (e.g., the 'I-you' contrast) at a very early age indicates that there is no essential difficulty in this particular type of relationship; the difficulty adheres in the complexity of particular application conditions. (Nelson, 1985, p. 220).

Carter (1984) studied the use of kinship terms among children in India with a focus on the acquisition of social deixis. As Carter points out, kinship term acquisition studies have consisted of asking children to define the terms (e.g., Haviland and Clark, 1974; Chambers and Tavuchis, 1977), asking them the conditions under which one could be a member of a certain class of kin (Piaget, 1928; Elkind, 1964), asking children to name the persons that certain terms referred to (Greenfield and Childs, 1977) and asking subjects to name the members of their households and describe the relationships (Levine and Price-Williams, 1974; Price Williams, et al., 1977). None of these researchers was able to find enough

evidence to ascertain the children's command of the nature of the reciprocal relationships involved.

Carter asked his subjects (aged 3 - 15 years) the following questions:

1. Who is this (pointing to the person)/X (name)?
2. He/she is _____? What do you call him/her?
3. You are his/her_____? He/she calls you _____?
4. Y is his/her _____? He/she calls Y _____?
5. He/she is Y's _____? Y calls him/her _____?
6. What is a _____? Could you be a _____? How? Why not?
7. What is the difference between _____ and _____?

(Carter, 1984b, p. 192)

As would be expected, the older children in Carter's study gave responses which were quite similar to adult responses. Their answers were usually based on genealogy (birth and marriage). The youngest children were unable to answer questions such as 'what does _____ mean?' but usually had no difficulty with questions such as 'what do you call him/her?' In fact, they were able to justify their adddress usages with such statements as 'he is my junior.' Interestingly, the justifications did not rely on genealogy.

Carter concluded that the young children's address systems were not imitations of adult usage nor completely (if at all) based on simplicity or complexity of semantic components (Haviland & Clark, 1974). The children could not base their responses on such perceptual features as absolute age, but rather had to consider age relative to speaker and therefore had to be able to shift perspectives from one viewpoint to another.

Carter's research indicates that, while young children may not be able to give a verbal definition of the referential aspects of kinship terms, their ability to utilize the terms of address in their daily social interactions is well developed at a very early age. In spite of the fact that they cannot describe the genealogical and/or relational aspects of the terms, they are well versed in the pragmatic aspects.

It seems, then, that even within a domain as specific as kinship, there may be variation in the child's ability to conceptualize, as well as verbalize, aspects of a concept as closely related as the vocative and referential functions of the same kinship term. If, as Piagetian theory suggests, kin-term meaning is anchored in the development of logical structures, the relationships involved should be accessible for all aspects of the concept once it has been acquired (unless, of course, they are not the same concept). One possible explanation of the seemingly contradictory research results is that the referential aspect depends on a semantic base, while address depends on a more contextual, pragmatic, social base. Consequently, one of the areas to be explored in this research is whether or not there are significant differences in the structure and/or the content of the definitions that children of various ages give for kinship terms that share the same referent, i.e., 'Mother' vs 'Mommy.'

Kinship Terms as Social Role Categories.

Kinship terms can be thought of as geneologically determined (Scheffler, 1976) or as having multiple determinants (Schneider, 1970; Carter, 1984). Schneider (1970) asserts that there are three distinct but closely related ways in which American kinship terms are defined: 1) a relationship of biogenetic substance; 2) a mode of interpersonal relationship governed by a code for conduct; and 3) both 1 and 2 at once -- blood relatives (p.88). Sheffler (1976), on the other hand, maintains that since it is the genealogical relationship which ascribes the social one, genealogy has to be the determining factor. Furthermore, relatives 'in-law' are so categorized by a simple extension of the 'blood-relative' category.

A major distinguishing point between those two views is that for Schneider the social aspect of the meanings of kinship terms stands in a paradigmatic relationship with the geneological aspect, while for Scheffler the social aspect is hierarchically subordinate to the genealogical aspect since the former is derived from the latter. Put another way, the question is whether the social connotations (nondefinitive meaning) of kinship terms are derived from the necessary and sufficient conditions (definitive meaning) or whether they are separate but related aspects of the complete meanings of those terms. This question could have serious implications for the discussion of concept acquisition and development particularly in the domain of social objects.

The research in the field of developmental psychology represents a variety of perspectives on the question of how children's acquire their concepts. There are those who focus on the functional aspects of the referent (i.e., Vygotsky, 1962, 1969; Nelson, 1981, 1983, 1985) and those who believe that the defining criteria (for at least some concepts) are perceptually based (i.e., Clark, 1973). But Clark admits that in order to understand kinship terminology the child has to have some knowledge about social roles.

Fischer, Hand, Watson, Van Parys and Tucker (1983) proposed an 18-step sequence as the course by which children develop social categories (behavioral role categories) in the preschool years, beginning with "agency of self" (age 1) and ending with "reciprocal role networks" (between 4 and 5 years). During this time the child is developing 'behavioral role categories' consisting of a collection of behaviors and characteristics related to a social role. Recognition of the reciprocal nature of the roles did not appear until the final step. (Clearly, Fischer anticipated this final step much earlier than Piaget (1928)).

Watson and Amgott-Kwam (1983) tested the generalizability of Fischer's social sequence to parental roles and found the same sequence. Additionally, they found that "children understand a given concept of family role relations in their own families before they could generalize it to family relations in general" (p. 11). Moreover, those children who were able to verbalize the various intersecting

relationships within traditional and alternative family units were able to give 'abstract' definitions of families in general. They admitted that language level may have been confounded with conceptual level.

It cannot be denied that children know a great deal about the roles of certain actors in their culture. They also learn a great deal about sociolinguistics--how one must interact linguistically with certain members of the community (Shatz and Gelman, 1973; Sachs and Devin, 1976; Carter, 1984). Andersen (1986) demonstrated that children as young as 3;9 already knew 'motherese,' the term for the special register used with beginning talkers.

It appears unlikely that children form their kinship categories on the basis of genealogy. It is more likely that those categories are based on what Fisher et.al. refer to as 'behavioral role categories' which are not necessarily organized like hierarchical categories. If their categories are organized by behaviors it is entirely reasonable to expect that they would describe these categorical concepts in terms of behaviors/activities.

Acquiring Kinship Terminology

The major research in children's acquisition of the meanings of kinship terms has taken one of the following two thrusts:

1. Piagetian cognitive development (Danziger, 1957; Elkind, 1962; Swartz and Hall, 19720) or

2. Componential analysis (Haviland and Clark, 1973; Romney and D'Andrade, 1964; Wallace and Atkins, 1966).[2]

Piaget (1928) in his experiments on children's acquisition of relational terms presents some of the earliest psychological data on the acquisition of kinship terms. The 1928 studies included only two such terms--brother and sister. He asked 240 children between the ages of 4 and 12 several questions about these terms including trying to elicit definitions. Based on his data he arrived at three stages in their development:

I primitive - brother = boy; (Only boys and not men are brothers.)

II relational - brothers = children of the same parents; however, only one of them was a brother/sister--the relationship was not reciprocal. At this stage men were usually allowed to be brothers and women sisters.

III relational and reciprocal - If you had a brother you were also a brother.

His data indicated that Stage III was normally achieved at the age of nine or ten.

The Piagetian oriented studies revealed conflicting results. Some appear to support Piaget's (1928) position (e.g., Elkind, 1962; Price-Williams, Hammond, Edgerton, and

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[2] Reproductions of the Wallace and Atkins (1960) and the Romney and D'Andrade (1964) Componential Solutions appear in Appendix A.

Walker, 1977), while others found indications that the terms with which the subjects had the most experience might be the ones which were articulated at the higher levels (Danziger, 1957; Deutsch, 1979). "If the level of conceptualization depended only on a general formal capacity and was independent of context, then each child should deal with all kinship terms on the same level" (Danziger, 1957, p. 230). Danziger's range of kinship terms was much wider than Piaget's--besides brother and sister he included daughter, cousin, and uncle. He noted that while all of the terms go through each of these stages, they do so at different times. Elkind (1962) concluded that there were two distinct concepts involved in the acquisition of the term brother: a) the brother concept itself, and b) the concept of having a brother. However, when Swartz and Hall (1972) replicated Elkind's study they did not find the systematic progression of two distinct concepts, but rather variable ones. "Thus the analysis did not substantiate (but also did not refute) the existence of two developmentally distinct concepts" (Swartz and Hall, 1972, p. 242).

Haviland and Clark (1973) explored kinship terms in children in an attempt to establish a predictable order of acquisition. This research was based on Clark's (1973) semantic features acquisition theory. They examined the componential analysis systems used by anthropologists (i.e., Romney and D'Andrade, 1964 and Wallace and Atkins, 1966) and found that these systems could not be used to explain the

available acquisition data because they could not adequately represent the lexical entries for kin terms--they were unable to deal with the relational and reciprocal nature as put forth by Piaget. Haviland and Clark offered an alternative approach to componential analysis--analysis by relational component in which the basic relational component is taken to be the parent-child relationship.

Haviland and Clark made several predictions: 1) The first features to be acquired would be based on the child's perceptions--size, sex, voice quality, clothing style, etc.; and 2) Since relational components have no perceptual correlates, they would be acquired after the property features. According to these researchers, the order of acquisition would be:

1. One relational component (child of or parent of--son, daughter, father, mother).
2. Both relations (brother/sister--child of parent of).
3. Same component recursed (grandparent, grandson--parent of parent of, child of child of).
4. Both relations and recursion (aunt, uncle--child of parent of parent of).[3]

They found that among their subjects (aged 3;0 to 8;10) the level of complexity of the term was correlated with the level of definition in 27 of 30 cases. Only 17 of the 29

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[3]. Based on their results they later revised the ordering of their complexity levels reversing levels II and III.

children showed levels of definition which correlated with their experiences.[4] Although their results did not fit their model, which had assumed that one relational component with recursion (parent of parent of, or child of child of) would be less complex than two relational components without recursion (child of parent of), they assumed that the original order of their categories had been reversed, and concluded that level of complexity, rather than experience, was the crucial factor in children's ability to define kinship terms.

The issues of experience, as well as linguistic input, were touched upon only briefly by Haviland and Clark, but were explored more completely by Deutsch (1979) who compared knowledge of kin terms in family children and orphans. His subjects were 84 German children between the ages of 6 and 10. Deutsch's study differed in several ways from the ones previously cited. Firstly, he used natural as well as artificial kin terms. Additionally, he used dolls representing several generations of males and asked the subjects to name the relationships between the dolls. Unlike the other studies, certain aspects of the relationships were explained to the children and they were required to identify others. The subjects were also asked to label the relationships between pairs of mice using an artificial system that was described to them. This aspect was employed to control for

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[4]. Experience was determined through parental interviews regarding the degree of contact with each of the relatives involved (if the child had such a relative).

familiarity since both groups of children would be equally unfamiliar with the artificial system.

Deutsch avoided the definition method because he thought it would not allow him to distinguish between a familiarity and conceptual deficit interpretation, since the children who lived in families were assumed to be more familiar with linguistic input relevant to the acquisition of the meanings of kinship relations.

Deutsch found that in each of his three age groups (5 & 6, 7 & 8, 9 & 10) there were generally differences between children raised in orphanages and children raised in families. As would be expected, the levels of sophistication of the responses increased with age within both groups. Because his data appeared to support Haviland and Clark's complexity hypothesis, Deutsch ruled out familiarity alone as the explanation for differences between orphan and family children's ability to use kinship terms. However, he concluded that "exposure to a specific linguistic input clearly also has specific conceptual consequences" (p. 324). He stated further that while interest and accessibility to information about kinship relations is not the crucial input factor for the acquisition process, the opportunity to get passive or active experience in the use of kinship terms might be.

Cross-cultural researchers have also been concerned with the acquisition of kinship terms in different cultures, particularly differences which may be due to the effects of

experience. Price-Williams, Hammond, Edgerton, and Walker (1977) studied the movement from an egocentric perspective to decentration in kinship term definitions among rural Hawaiian children between the ages of 4 and 14. The variety of family composition in the community allowed them to analyze their data by nuclear and non-nuclear groups. Their results supported Piaget's (1928) holistic logical structural position.

Greenfield and Childs (1977) explored the understanding of sibling concepts among Zinacantan children in Southern Mexico. Unlike Price-Williams et.al.'s community, the Zinacantan lived in primarily nuclear family units. Their subjects ranged in age from 4 to 18. They found the same sequence of stages that Piaget had found among his Swiss subjects although the system of sibling terminology is different from the one on which Piaget's research was based. These authors concluded that "kin terms can be learned through actual examples without the child analyzing a term into its semantic components" (p. 355). This use of kinterms without componential analysis is also stressed by Carter (1984) when he criticizes the 'deficit' model of children's meanings. He suggests that

> . . . before accepting the earlier studies of children's usages and definitions of 'kinship' terms as providing a complete account of their grasp of this particular domain of culture, it may be fruitful to examine the data from additional perspectives. In particular, we ought to ask if the peculiarities of children's usages and definitions of 'kin' terms may be

> regarded as reflecting not an incomplete grasp of an adult system of kinship terminology, but rather a coherent and relatively complete grasp of another, different component of adult language and culture (p. 183).

Carter concluded that what these children learn initially is not a system of kinship relations, but a system of terms of address. "The rules of social deixis concerned with appropriate forms of address do not, moreover seem to be related more than minimally, it at all, to the semantics of kintype classification. The young children in my study who use the Maharashtrian address system appropriately, including what seem to be (but are not) 'kin' terms, are unable to understand either the referential functions of kin terms or the genealogical grid which underlines that function" (p.198).

Although a certain level of development of language facility and general cognitive functioning is obviously necessary in order to be able to define any concept verbally, the effects of personal experience should not be minimized.

Greenfield and Childs point out that there are differences in the child's definitional development of kin terms and their application of them. Taking Nelson's (1973) functional core hypothesis, they consider definition a form of generalization and suggest that while earliest definitions of kin terms may refer to perceptual attributes, such as defining a brother as a boy (Piaget, 1928; Haviland and Clark, 1974), earliest comprehension "involves referents that are of functional importance to the child" (Greenfield and Childs, 1977, p. 356).

Haviland and Clark found that the highest (negative) correlations between semantic complexity and definitional levels (though not significant), were among the older children, while the highest correlations between experience and level of definition were among the youngest group. This brings up the possibility that experience may play a greater part in the acquisition of the meaning of kinship terms for younger children, while complexity level may play a greater part for the older children. In many of the cases, the younger children seem to be working on an extensional definition, while the older ones seem to have grasped the intensional definitions.

It is clear from a review of the literature that the findings from prior studies of the acquisition of kinship terms are by no means conclusive in any regard. The research indicates that many factors may be interacting in varying degrees in different situations. Some of the questions which emerge touch on the issues of comprehension vs. production, experience vs. cognitive level, experience vs. complexity level, pragmatics (address) vs. semantics (reference), experience vs. linguistic input vs. cognitive level vs. complexity level, as well as the effects of perceptual attributes on all of these. The attempts to tease apart these factors have had moderate success, but the issues have not been decisively settled.

Summary and Goals

As the literature review indicates, many factors have to be considered in determining why children define terms in the way that they do. While there appears to be some agreement that a good definition requires a certain Aristotelian syntactic format, what the contents should be is questionable. Some researchers propose that definitions should contain only definitive (necessary and sufficient) features (Brown, 1976), but others suggest that we also include their connotational components (Wallace and Atkins, 1960).

Various factors have been cited for young children's inability to give syntactically sound and semantically complete definitions. The focus of some of the research has been the child's inability to employ the concept of class-inclusion necessary for taxonomic classification (Piaget, 1926, 1945; Wolman and Baker, 1965). Markman (1983) however, suggests that all domains may not present the same level of difficulty for children who are trying to impose a hierarchical structure. She proposes that collections (i.e., family), which represent part-whole relationships, and consist of labels that are mutually exclusive, may be easier for children to learn than classes (i.e., animals) which represent classs-inclusion hierarchies and whose labels violate mutual exclusivity (i.e, 'A poodle is a dog.' and 'A

poodle is an animal.' are both true simultaneously.) Those who espouse a component process of concept acquisition suggest that the incomplete definitions are manifestations of missing semantic components in children's intensions (Clark, 1973; Gentner, 1978, 1981).

The afore-mentioned difficulties, for the most part, are concerned with the relationships between objects in the world, and the objects and words. It is possible, however that the 'deficit' that children exhibit results from either the lack of, or incomplete understanding of relationships between words and words--a metalinguistic feature of definitions.

Some assert that metalinguistic awareness is a better predictor of whether a child will give a syntactically, as well as semantically complete definition than any of the previously proposed factors (Saywitz & Wilkinson, 1982; Litowitz, 1977; Benelli, Arcuri, & Marchesini, 1988). In other words, while young children may possess all of the information necessary to provide the appropriate semantic units of a 'meaning,' they may not possess the meta-linguistic awareness that is evidenced in the definitions of older children and adults.

Metalinguistic awareness has been defined as "the ability to reflect upon the rule system as a disembodied entity and the object of knowledge" (Saywitz and Wilkinson, 1982). This knowledge does not appear to be a unitary ability, but a multidimensional capacity which involves several different

linguistic skills (Clark, 1978; Saywitz and Wilkinson, 1982). While the greatest number of these skills seem to emerge concurrently with concrete operations (six to eight years of age), some aspects may begin to emerge as early as two years of age, while others (e.g., the ability to provide Aristotelian definitions) are sometimes absent in children as old as eight or nine.

Even if a child is aware of the intensional components of a particular word based on his conceptual knowledge, the class inclusion aspect (the fact that the superordinate category subsumes the subordinate category) is not necessarily apparent in the relationship that exists between objects in the world. This is especially true if, in fact, children's concepts are based on thematic relationships in the world. Taxonomic classification, however, expresses a linguistically based relationship between words (Nelson, 1985; Benelli, et al., 1988). Moreover, children sometimes use superordinate terms, but the function of the terms does not appear to be superodination--they are sometimes used in a paradigmatic relationship, as if they represent the same level in the hierarchical structure. For example, in the presence of more than one kind of flowers, one may be known as a rose but, not a flower, while another may be a flower instead of an iris. In other words, the relationship between rose and flower becomes horizontal rather than vertical.

It stands to reason that the verbal definitions of concepts would have to reflect not only the 'depth of taxonomy' --that is, knowledge of the various hyponymic relationships (Litowitz, 1977) but also, whether or not that person has acquired a 'literate register' (Watson, 1985). This literate register includes the socially agreed-upon format for the verbal presentation of a definition and is presumably acquired through formal schooling. A well formed definition, then requires the decontextualization of the concept, which is particularly difficult for young children, whose concepts are contextually bound.

Kinship terms represent one of the most complex areas of definition. Firstly, there is no concensus as to what, if anything, the terms themselves 'mean'. They are at once labels for people, labels for categories of people, labels for social role categories, labels for relationships, and terms of address as well as terms of reference.

Kinship terms are also polysemic in that they may also denote non-kin relations, but additionally, the same referent may be known by different lexical items, i.e., mother, mommy, mom, etc. Moreover, words that are assumed to be synonymous, e.g., father and daddy, may in fact invoke different representations. Indeed, some researchers propose that we (adults as well as children) have dual repre-sentational systems--one which contains the definitive aspects of our concepts (necessary and sufficient features), and one which contains prototypes.

Carter (1984) demonstrated that children learn the deictic function of kinship terms of address, and are able to justify their usage in terms of relative age with regard to the speaker and adressee. Those same subjects were unable to 'define' the terms of reference for the same relationships. This led Carter to conclude that what children learn about kinship terms is not class-inclusion (Piaget, 1926), or semantic components or even relational aspects (Haviland and Clark, 1973), but a set of pragmatic skills. This position is close to that of Schneider's (1970) multiple determinants and is contrary to Scheffler's (1976) assertion of genealogically based determinants. The qualitative analyses in the present study should shed some light on the this issue by examining the types of information included in the definitions.

The goal of this research is to determine whether kinship terms which have the same referent (e.g., father and daddy) and which we assume to be synonymous, will elicit different definitions. If dual representational systems are involved, different aspects of the terms will be evoked by the address term (daddy) than by the reference term (father).

The research reviewed reveals many dimensions along which concepts and therefore definitions of words may differ. Many of the variations appear to be developmentally determined, but others seem to result from domain-specific characteristics. While the specific focus of this research is kinship terminology in general, and parental terms in particular, in order to address the issue of variations between ontological

categories, the study includes other domains (i.e., natural kinds, and manufactured kinds).

Within the kinship term group, there may also be intra-domain variation. For example, in the use of kinship terminology, some forms may be considered terms of reference (words used when talking about a particular relative, i.e., my mother) while others may be considered terms of address (those used when talking to a family member, i.e., mom, mommy, etc.).

A critical aspect of this research is the reference/address distinction. Recognizing that the kinship terms being compared (father/daddy, mother/mommy) may be considered synonyms, words in the other two categories are also paired with words that are generally assumed to have the same referent (i.e., house/home) to examine possible differences in their definitions as well.

Aside from domain-related differences, one of the underlying assumptions of much of the research is a shift from characteristic to defining features, and closely related is the categorical/functional factor. While both of those are assumed to vary developmentally, there may be categories in which the age differences in definitions may not be as dramatic due to the ontological status of the word. For example, it has been suggested that since human artifacts are usually manufactured for a specific use, the function of the item is necessarily part of the definition (Keil, 1987; Weirzbicka, 1984). Natural kinds, however, are alleged to be inherently hierarchically organized in nature and therefore

lend themselves to categorical definitions (Wierzbicka, 1984). Additionally, script theory (Nelson, 1986) suggests that conceptual development may be based on interaction with objects. This would suggest the possibility that animate objects (family members) may also be more likely than other types of words to elicit script-based functional definitions. These aspects are explored through the comparison of types of definitions (functional vs categorical) given for the three types of words--kinship terms, manufactured kinds and natural kinds.

The metalinguistic requirements involved in producing a verbal definition (i.e., the Aristotelian format) are also explored in this research. It has been suggested that while children may have knowledge of a particular concept they may not have mastered the 'ISA' format considered appropriate to verbalizing a definition.

Although superordination may reflect hierarchical categorization, a well-formed definition also requires additional descriptive information. In that regard, the research addresses the issue of the fulfillment of the semantic as well as the syntactic requirements of a definition, assuming that developmental differences along those lines will be manifested in children of different ages.

It is hypothesized that:

1. The youngest subjects (5-year olds), whose concepts will be relatively context bound, will define both terms of address and terms of reference functionally. Additionally, their definitions will lack the 'X isa Y' syntactic format.

2. The middle group (9-year olds), who will have had a few years of formal schooling, will give different definitions for the terms of address and the terms of reference. Their definitions will reflect greater metalinguistic knowledge than the younger children; however, the pragmatic aspect of the concept (daddy) will elicit funtional descriptions, while the reference term will evoke more definitive (necessary and sufficient) semantic units.

3. The oldest subjects (12-year olds) will produce definitions which reflect adult-like taxonomic depth, as well as a well-developed Aristotilean format for both the reference term and the address term. It is assumed that, not only does a child this age have the ability to give hierarchically organized definitions, but s/he will realize that the 'formal' context of school requires the conceptual core of meaning in a definition. Even if the term 'daddy' evokes primarily the 'symptomatic,' representation of the concept 'male parent,' the older child's awareness of the pragmatic requirements of the situation will prevail.

4. While the quality of the definition will vary as a function of age, there will also be variation as a function of the ontology of the domain--words which refer to manufactured

objects will elicit functional definitions, since they were created for particular 'functions,' while words referring to naturally occurring objects will elicit hierarchically organized categorical responses. Kinship terms of reference (e.g., father and mother) are also expected to elicit categorical responses. Terms of address, however, are expected to elicit predominantly functional definitions.

CHAPTER II

METHOD

Overview: General Method

Participants in this research are drawn from school groups in the U.S. Virgin Islands. The Virgin Islands school population is for the most part a mixture of several ethnic groups. There are students from the entire Eastern Caribbean basin, in addition to native blacks, native whites (mostly of French Catholic extraction whose families originally came from St. Barts and other French speaking islands), black and white continental Americans, and a growing Arab and East Indian community. While all of these ethnic groups are represented in the various schools, it would be difficult to recruit a large enough sample of each ethnic group in the same age level. Moreover, it is an assumption this investigation that regardless of cultural background, developmental differences will obtain. For this reason sub-cultural membership will not be a variable under investigation. Results that suggest specific cultural or linguistic influences may provide the basis for further research.

Subjects.

Sixty-seven kindergarten, third-grade and sixth-grade students from a public elementary school in St. Thomas, Virgin Islands participated in the study. The group consisted of twenty-one kindergardeners (mean age 5.88 years), twenty-six third graders (mean age: 9.16 years) and twenty

sixth graders (mean age: 12.15 years). The kindergarten group consisted of 12 females and 9 males, the third-grade group, 12 females and 14 males, and the sixth-grade group, 13 females and 7 males.

Materials

Lists of words were constructed to include specific types of entities: animates, inanimates, natural kinds, artifacts, and kinship terms. One of the questions posed in the literature is whether terms for animate objects will elicit different types of definitions than terms for inanimate objects; therefore, the lists included terms for both animate and inanimate objects. Additionally, the lists included natural kinds (gold, island, lime, rock and sea), manufactured objects (car, couch, house, and pants), as well as kinship terms. In the first interview each subject was asked to define all of the above terms. In the second interview a second list of words included three of the natural kinds (gold, lime, island), while synonyms for the other two were used (ocean = sea, stone = rock). Similarly, two of the manufactured objects were repeated (car, pants), while synonyms for the other two were used (home = house, sofa = couch).

Since the focus of the research is on kinship terms, parental terms in particular, the variation for these terms between List 1 (Form A) and List 2 (Form B) was somethat different. Form A included words that were assumed to be terms of reference (father and mother), and Form B included

words that were considered equivalent terms of address (daddy and mommy). The additional kinship terms included represented one pair of lineal relations (grandmother on Form A and grandfather on Form B) and two pairs of co-lineal relations (aunt on Form A and uncle on Form B, brother in Form A and sister on Form B), each varying only on gender, and one ablineal relation (cousin), which is neuter in English, appearing in both forms. The interview forms appear in Appendix B. Table 1 provides the complete lists used on each form.

Table 1
List of Words to be Defined for Each Interview

Form A		
Kinship	Manufactured	Natural
Aunt	Car	Gold
Brother	Couch	Lime
Cousin	House	Island
Daddy	Pants	Rock
Grandmother		Sea
Mommy		
Form B		
Kinship	Manufactured	Natural
Uncle	Car	Gold
Sister	Sofa	Lime
Cousin	Home	Island
Father	Pants	Stone
Grandfather		Ocean
Mother		

Procedure

Each subject was interviewed individually on two separate occasions, approximately four weeks apart. The interviews were conducted in a quiet place at their school. Each interview took approximately 30 minutes, during which each subject was asked to define a list of words. The second round of interviews was conducted under the guise of having

misplaced the original data. At the first round of interviews approximately one half of the subjects were asked to define the words on Form A, and one half were asked to define the words on Form B. At the second round those who had previously responded to Form A were interviewed using Form B and vise versa. Each interview was recorded on audio tape as well as on a data form.

To control for order effects the lists were randomized for each presentation. Each word was printed on a 3x5 index card and the cards were shuffled for each interview. For each word the subject was asked "What is a _____?"

The actual interview was preceded by a brief introductory session in which each subject was asked the following:

CAN YOU TELL ME WHAT A FAMILY IS?

Besides serving as an ice-breaker, this question also served as an indication of whether or not the subject used the formal definitional structure--(a family ISA...) as well as whether or not s/he normally used hierarchical organization in definitions.

Data Analyses

The responses were coded using Benelli et al.'s (1988) definitional coding categories, as follows:

1) Perceptual - referring just to the perceptual appearance of objects, i.e., "daddies have mustaches."

2) Functional - based only on functional/dynamic properties of objects, i.e., "mothers cook food."

3) Functional + Perceptual - containing both of the above, i.e, "daddies have mustaches and drive cars."

4) Categorical - superordinate category alone, i.e., "a mother is a woman/lady)."

5) Specified Categorical - some type of specification added to categorical term, i.e., "a mother is a member (a part of) your family who lives with you."

6) Generic Categorical - generic terms, such as "thing," "object," or in this case, "someone" or "a person" instead of more specific superordinate (a parent).

7) Specified Generic - generic superordinate, followed by specification, i.e., " A mother is someone who lives with you."

According to Benelli et al., the dimensions for the analysis of these categories are:

1) The absence or presence of the subordinate term, which represents the main distinction between the format "an ...x is..." or "an ...x has..." (categories 1, 2, and 3) and those having Aristotelian form, i.e., "An ...X ...IS A...Y." (categories 4, 5, 6, and 7).

2) The use of the appropriate generic superordinate, which according to Watson (1985), marks the shift from the use of just the syntactic/formal requirements of definition (categories 6 & 7) to the use of semantic requirements, as well (categories 4 & 5).

3) The number of information units contained in the definition. This would differentiate between those definitions containing only one type of information (1, 2, and 4) and those containing combinations of types of information (3, 5, 6, & 7). (See Wehren, De Lisi and Arnold, 1981).

Since the two forms (A and B) of the instrument were alternated for each subject (i.e., half received form A at the first session and half received form B), the responses were coded by round. (Round 1 designates those subjects who received Form A at the first session).

Crosstabulations by class and gender were computed for each word. The results of the crosstabulations were grouped according to Benelli et al's dimensions. Two additional categories were added--one to reflect 'no response or irrelevant response,' and 'examples' to reflect those responses in which the subjects cited examples rather than definitions. The results of the crosstabulations were entered into Chi-square analyses by round, grade, and gender. Additional analyses were performed to examine within-subject differences (if any).

Multivariate analyses of variance, with round, grade, and gender as the between group variables, and form and wordtype as within subject variables, were performed to ascertain significant group differences in specific response categories. The results of the analyses of the kinship terms appear in Chapter III, the manufactured and natural kinds in Chapter IV and a comparison of the three in Chapter V.

CHAPTER III

RESULTS: KINSHIP

As previously mentioned, the responses to each word were coded using nine categories--Benelli et al's 7, plus 'no response/irrelevant,' and 'examples.' The distribution of the percentages of responses to the kinship terms in each category can be seen in Table 2.

Table 2
Kinship Terms by Category of Response

	Daddy (A)	Father (B)	Mommy (A)	Mother(B)
Perceptual	3.0	3.1	0	1.5
Functional	9.1	16.9	9.1	16.7
Percept./Functional	0	0	1.5	1.5
Categorical	25.8	10.8	27.3	10.6
Specific/Categor.	34.8	47.7	37.9	42.4
Generic/Categori.	0	0	0	0
Specific Generic	21.2	15.4	18.2	16.7
Examples	3.0	0	3.0	1.5
Irrelevant/No Resp.	3.0	6.2	3.0	9.1

	Brother (A)	Sister (B)	Aunt (A)	Uncle (B)
Perceptual	3.0	0	0	1.5
Functional	7.5	13.8	8.2	1.5
Perc./Func.	0	1.5	1.6	0
Categorical	14.9	9.2	8.2	6.2
Specific/Categor.	43.3	43.1	55.7	43.3
Generic/Categor.	0	0	0	0
Specific/Generic	20.9	16.9	13.1	18.5
Examples	3.0	3.1	1.6	1.5
Irrelevant/No Resp.	7.5	12.3	11.4	13.8

	Cousin(A)	Cousin(B)	Grandma(A)	Grandpa(B)
Perceptual	3.0	1.5	1.5	1.6
Functional	7.6	15.2	7.6	14.6
Perc./Func.	0	1.5	3.0	1.6
Categorical	12.1	6.1	10.6	1.6
Specific/Categor.	43.9	48.5	53.0	50.0
Generic/Categor.	0	0	0	0
Specific/Generic	21.2	16.7	13.6	15.6
Examples	6.1	1.5	4.5	1.6
Irrelevant/No.Resp.	0	0	3.0	0

By inspection of the table it can be seen that the patterns of response for the daddy-mommy pair and the father-mother pairs are quite similar. Rank order correlations were computed using Spearman's rank-difference correlation method. The results are shown in Table 3.

Table 3
Rank correlations for parental terms, by Grade

	Kg.	Third	Sixth	Total
Daddy/Mommy	.4638	.6050**	.2887	.5463**
Daddy/Father	-.2319	.6410**	.3839	.4244**
Father/Mother	-.0296	.6428**	.8168**	.3829*
Mommy/Mother	-.0032	.4847*	.3651	.3729*

* $p = .01$
** $p = .001$

As the table shows, the only positive correlation for the kindergartners (although not significant) was that between daddy and mommy. For the sixth graders, father and mother yielded a highly significant positive rank correlation. The third graders differed from the other two groups in that all of their rankings were correlated. These results suggest that there was no set pattern of response for the kindergarteners, but a rather rigid one for the third graders. The sixth graders, on the other hand, appeared to discriminate more in the way they responded to each word.

Table 4 depicts the distribution of the responses for each of the parental terms by grade. The greatest percentage of the kindergarteners' responses to mother was functional and for mommy the greatest percentage was categorical. The third grade responses were fairly evenly distributed between specified categorical and specified

generic. The sixth grade responses were concentrated categorical and specified categorical groupings.

Table 4
Distribution of Responses to Parental Terms by Grade

	Mother(B)			Mommy(A)		
	Kg.	Third	Sixth	Kg.	Third	Sixth
Perceptual	5.0	0	0	0	0	0
Functional	40.0	11.5	0	25.0	3.8	0
Perceptual/ Functional	0	3.8	0	5.0	0	0
Categorical	15.0	11.5	5.0	35.0	23.1	25.0
Specific/ Categorical	5.0	34.6	90.0	5.0	34.6	75.0
Generic	0	0	0	0	0	0
Specific/ Generic	5.0	34.6	5.0	10.0	38.5	0
Examples	5.0	0	0	10.0	0	0
Irrel./N.R.	25.0	3.8	0	5.0	0	0
	Father(B)			Daddy(A)		
	Kg.	Third	Sixth	Kg.	Third	Sixth
Perceptual	10.5	3.8	0	10.0	0	0
Functional	47.4	7.7	0	15.0	11.5	0
Perceptual/ Functional	0	0	0	0	0	0
Categorical	15.8	11.5	5.0	40.0	19.2	20.0
Specific/ Categorical	5.3	50.0	85.0	0	26.9	80.0
Generic	0	0	0	0	0	0
Specific/ Generic	5.3	26.9	10.0	15.0	42.3	0
Examples	10.0	0	0	0	0	0
No Response	15.6	3.8	0	5.0	0	0

Note. Kindergarten $n = 21$, third grade $n = 26$, sixth grade $n = 20$.

Chi-squares of independence were performed on each word by grade. The results can be seen in Table D-1 (Appendix D). The results indicate that response category was not independent of grade. Mommy resulted in the lowest p value (.0001) while mother, father, and daddy all yielded p's of $<.00005$, indicating that mommy elicited the least variation between the grades.

Functional Responses

One of the predictions of the study was that the degree to which the subjects produced functional definitions would vary by grade level. The percentages of functional responses to kinship terms can be seen in Table 5.

Table 5

Percentages of Responses Using Functional Definitions for Kinship Terms, by Grade[a]

	Kindergarten		Third Grade	
	A	B	A	B
Mommy(A)/Mother(B)	25.0	40.0	3.8	11.5
Daddy(A)/Father(B)	15.0	47.4	11.5	7.7
Brother(A)/Sister(B)	31.6	19.0	7.7	3.8
Grandma(A)/Grandpa(B)	38.9	20.0	7.7	3.8
Aunt(A)/Uncle (B)	31.6	20.0	11.5	7.7
Cousin(A)/Cousin(B)	35.0	15.0	7.7	7.7
Overall Mean	29.5	26.9	7.0	8.3

Note. Kindergarten n = 21, third grade n = 26, sixth grade n = 20.

The table indicates that the third graders' responses were much more consistent across forms than were those of the kindergarteners.

The parental kinship terms were entered into a multivariate analysis of variance with three between-group factors (round, grade, and gender) and two within subject factors (maternal vs paternal and address vs reference). Since the sixth graders gave so few functional responses to the parental terms they were not included in the MANOVA.

[a] Grade 6 is omitted since so few of their definitions were solely functional in nature.

There was a significant main effect for grade [*F*(1,39)= 5.22, *p* = .028] with the kindergarteners giving significantly more functional responses overall than the third graders. There was also a significant main effect for address vs reference [*F*(1,39) = 6.31, *p* = .016], but not in the expected direction--overall, father and mother elicited more functional responses than daddy and mommy.

Both the kindergarteners and third graders produced significantly greater percentages of functional definitions for mother than for mommy, and the kindergarteners also gave more functional definitions for father than for daddy. The third graders, however, gave fewer functional definitions for father than for daddy. These results yielded a significant interaction between grade and address/reference difference [*F*(1,39) = 4.84, *p* = .034]. In other words, the kindergarteners gave more functional definitions for both terms of reference (mother and father), but among the third graders the maternal term of reference (mother) elicited more functional definitions than the maternal of address (mommy), while the paternal term of address (daddy) elicited more functional definitions than the paternal term of reference (father).

When brother and sister were compared in terms of functional responses the only significant main effect was for grade [*F*(1,55) = 6.84, *p* = .011]. The kindergarteners gave the greatest percentage of functional definitions.

A comparison of the aunt/uncle pair also yielded significant grade differences [$F(1,55) = 4.29$, $p = .043$]--again, the kindergarteners gave more functional definitions than the third graders. A significant main effect for word [$F(1,55) = 4.50$, $p = .039$] indicated that aunt elicited a greater percentage of functional definitions than uncle.

There was also a significant round by gender by word interaction [$F(1,55) = 4.50$, $p = .039$], caused by the fact that for uncle the males and females did not vary by round, but for aunt the females who received Form A first (the form which includes aunt) were less consistent than those who received Form B first (the form which includes uncle). Among the males the reverse was true--those who received Form A first gave significantly greater percentages of functional definitions for aunt.

When the two grandparental terms were compared the grade effect persisted [$F(2,55) = 5.12$, $p = .009$]; however, only the third graders and kindergarteners actually differed significantly [$F(1,55) = 9.74$, $p = .003$]. There was also a significant three-way interaction (round by grade by word), [$F(1,55) = 4.42$, $p = .040$], with those kindergarteners who received Form A in Round 1 giving a significantly greater percentage of functional definitions for grandfather than they gave for grandmother than those who received Form A in the second round.

Semantic/Syntactic Requirements

The responses were combined into three combined groupings. The first combined those responses which were 1) perceptual, 2) functional, and 3) perceptual + functional. These are the three categories which Benelli and colleagues considered neither semantically nor syntactically adequate. The second grouping combined those responses which fell into categories 4 (categorical) and 5 (specified categorical) --the categories considered both semantically and syntactically adequate. The third grouping consisted of categories 6 (generic categorical) ad 7 (specified generic), which are only considered to be meeting the syntactic/formal requirements of a definition. A fourth category was created to accommodate those in which the subject gave either an example rather than a definition, or an irrelevant response. The distribution of the responses in these combined categories can be seen in Table 6.

As the table shows, all of the sixth graders' responses to the terms of address were semantically as well as syntactically adequate (either categorical or specific categorical), as were most of their responses to the terms of reference. The greatest percentage of the kindergarteners' and third graders' responses for the terms of address also fell into those two categories. The terms of reference yielded somewhat different results with the kindergarteners' responses being concentrated in the first three categories (those that were inadequate on both the syntactic and the

semantic levels)--45 percent for mother and 57.9 percent for father. Chi-squares of independence by grade and gender were performed for each word to test whether those two factors were related to responses in those four category groups. The analyses by gender yielded no significant results. The results of those analyses are presented in Table D-2.

Table 6
Distribution of Responses in Semantic/Syntactic Categories, by Grade

	Mommy (A)			Mother (B)		
	Kg.	Third	Sixth	Kg.	Third	Sixth
Category 1 (Inadequate)	30.0	3.8	0	45.0	15.3	0
Category 2 (Sem. & Syn.)	40.0	57.7	100.0	20.0	46.1	95.0
Category 3 (Semantic)	10.0	38.5	0	5.0	34.6	5.0
NR/Irrel./ Examples	20.0	0	0	30.0	3.8	0
	Daddy (A)			Father(B)		
Category 1 (Inadequate)	25.0	11.5	0	57.9	11.5	0
Category 2 (Sem. & Syn)	40.0	46.1	100.0	21.1	61.5	90.0
Category 3 (Semantic)	15.0	42.3	0	5.3	26.9	10.0
NR/Irrel./ Examples	5.0	0	0	25.6	3.8	0

Note. Kindergarten n = 21, third grade n = 26, sixth grade n = 20.

When the sibling terms were compared, true to expectations, the older subjects were more likely to give responses that were both syntactically and semantically sound than the younger ones, resulting in a significant main effect for grade [$F(2,55) = 41.65$, $p < .0005$]. A comparison

of the two youngest groups revealed that they differed significantly [$F(1,55) = 82.47$, $p < .0005$].

The grades varied significantly in terms of which category their responses fell into, creating a significant interaction betwen grade and semantic/syntactic difference. While on the other dimensions the third and sixth graders did not differ, on this one, not only did the kindergarteners and third graders differ [$F(1,55) = 4.22$, $p = .045$], but the third graders also differed significantly from the sixth graders [$F(1,55) = 28.53$, $p < .0005$]. There was also a significant main effect for wordtype with brother eliciting a significantly greater percentage of definitions that were both semantically and syntactically complete than sister [$F(1,55) = 4.24$, $p = .044$].

The aunt/uncle pair produced significant differences between the two youngest groups [$F(1,55) = 16.33$, $p < .0005$], as well as between the third and sixth graders [$F(1,55) = 25.21$, $p < .0005$.

Superordination

Responses to the parental kinship terms were combined into three categories: 1) those that did not readily fit into the Benelli groups; 2) those that fell into the first three Benelli categories (perceptual, functional, perceptual + functional); and 3) those that fell into the remaining Benelli categories (4 - 7: the ones including superordinate terms in the responses. A MANOVA was performed with round, grade and

gender as between group variables and address/reference and response category (1,2,3) as within subject factors.

There was a significant main effect for response category [$F(2,110) = 87.72$, $p < .0005$], and a significant grade by response category interaction [$F(4,110 = 15.55$, $p < .0005$]. The interaction reflects significant differ- erences between the kindergarteners and third graders [$F(1,110) = 59.66$, $p < .0005$], in that the third graders, like the sixth graders, were very unlikely to give responses in the first two categories.

Cousin was the only kinship term that was repeated exactly on both forms. The numbers of supeordinate responses to that pair were entered into a MANOVA with round, grade and gender as between subject variables and form as the within subject variable. The only significant main effect was for grade [$F(2,55) = 30.66$, $p < .0005$]. Again, the third graders produced significantly greater percentages of responses which included superordinate terms than the kindergarteners [$F(1,55) = 60.09$, $p < .0005$], but did not differ significantly from the sixth graders.

Brother and sister were compared by round, grade and gender in terms of superordination. This comparison resulted in a significant main effect for grade [$F(2,55) = 41.65$, $p < .0005$]. While the third and sixth graders did not differ, the third graders gave significantly greater percentages of superordinate definitions than the kinder-garteners [$F(1,55) = 82.47$, $p < .0005$]. Both of the younger groups gave

significantly greater percentages of superordinate terms for brother than for sister, resulting in a significant main effect for word [$F(1,55) = 4.24$, $p = .044$].

The grandparental terms yielded a significant main effect for grade [$F(2,55) = 58.28$, $p < .0005$] with the kindergarteners vs third grade differences being partic-ularly great [$F(1,55) = 114.43$, $p < .0005$]. There was also a significant word effect [$F(1,55) = 8.74$, $p = .005$], reflecting a greater percentage of superordinate terms for grandmother than for grandfather. A grade by word interaction [$F(2,55) = 4.06$, $p = .023$] reflects the kinder-garteners' almost complete lack of superordinate responses for grandfather.

When aunt and uncle were compared in terms of super-ordinate responses the only significant result was for grade [$F(2,55) = 62.24$, $p < .0005$]. It should be noted, though, that that difference only obtained between the kinder-garteners and third graders [$F(1,55) = 122.33$, $p < .0005$], and not between the third and sixth graders.

Qualitative Analysis

In response to the titular question "Is a Father a Daddy?" the answer is "NO." Only six subjects (3 kindergarteners, 2 third-graders, and 1 sixth-grader) defined it as such. Table 7 shows the types of responses that those terms elicited.

As Table 7 shows, the modal response to father was 'mother's husband' (Marriage category). However, a daddy is a father (synonym) according to 10 of the kindergarteners, and

six each of the third and sixth graders. It is also noteworthy that only two sixth graders defined a father in biological terms, i.e., 'gives your mother a child.' None of the subjects defined daddy biologically. The results for mother were similar--while only a total of 4 subjects defined a mother as a mommy, 16 described a mommy as a mother.

Table 7

Responses to Parental Kinship Terms by Grade

	Kg.		Third		Sixth	
	Daddy	Father	Daddy	Father	Daddy	Father
Synonym	10	3	6	2	6	1
Gender	1	2	3	5	1	3
Parent	0	1	1	3	2	1
Relative/ Family	5	0	0	2	0	1
Marriage	0	0	2	5	0	8
Biological	0	0	0	0	0	2
Other[a]	1	1	0	0	1	0
	Mommy (A)	Mother (B)	Mommy (A)	Mother (B)	Mommy (A)	Mother (B)
Synonym	5	3	6	1	5	0
Gender	2	1	1	3	3	3
Parent	0	1	2	2	2	0
Relative/ Family	1	0	0	2	0	3
Marriage	0	0	2	2	3	4
Biological	0	0	0	6	3	5
Sibling's parent	0	0	1	1	1	0
Other[b]						

Note. Kindergarten n = 21, third grade n = 26, sixth grade n = 20.

[a] The 'other' category includes 1 kindergartener who described a father as a person, one who defined daddy as uncle's brother, and one sixth grader who defined daddy as grandmother's son.

[b] 'Other' includes 1 third grader who defined 'mother' as grandmother's daughter and one who defined 'mommy' as uncle's sister.

It should be noted that while the numbers of kindergarteners and sixth graders who described both a father and a daddy in terms of gender appear to be similar, only one sixth grader failed to give additional information, for example 'A father is a man that has a child.' The same was true for the maternal terms.

Also of interest is that fact that five kindergarteners stated that a daddy is either a part of your family or related to you, while none of them said that about a father. However, 2 third-graders and one sixth-grader mentioned relationship with regard to father. While the modal response for mommy was mother (16 subjects), the modal response for mother (11 subjects) was biological in nature.

The responses to the remaining kinship terms can be seen in Table 8.

Table 8

Responses to Kinship Terms by Grade[a]

	Kg.		Third		Sixth	
	Cousin (A)	Cousin (B)	Cousin (A)	Cousin (B)	Cousin (A)	Cousin (B)
Au/UnCh Mo/Fa	0	0	9	10	11	10
Ni/Ne	0	0	0	0	4	2
Gender	0	0	1	0	0	0
Friend	5	5	2	3	0	1
Relative/ Family	0	1	9	10	2	2
Other[b]	0	1	0	2	0	0

[a] Au= aunt, un = uncle, ch = child, mo = mother, fa = father, ni = niece, ne = nephew, pa = parent, sib = sibling.

[b] Includes one third grader who defined cousin(b) as a person, one as brother's cousin, and one kindergartener who defined a cousin as 'a baby.'

Table 8 (con'd.)

	Kg.		Third		Sixth	
	Aunt	Uncle	Aunt	Uncle	Aunt	Uncle
PaSib	0	0	10	12	14	8
Gender	1	0	1	3	0	0
Marriage	0	0	0	1	2	1
Friend	0	2	0	0	0	0
Relative/ Family	1	0	5	7	2	2
Other[c]	0	0	1	1	0	0

	Kg.		Third		Sixth	
	Brother	Sister	Brother	Sister	Brother	Sister
ParCh	0	1	5	4	10	8
Gender	3	1	4	8	6	3
Relative/ Family	1	1	9	10	3	4
Friend	1	1	0	1	0	0
Other[d]	1	0	1	0	0	0

	Kg.		Third		Sixth	
	Grandma	Grandpa	Grandma	Grandpa	Grandma	Grandpa
Au/Un/Mo/ FaPar	1	0	15	12	15	11
Gender	1	0	0	0	0	0
Relative /Family	0	0	5	0	1	0
Marriage	0	0	0	1	0	1
Other[e]	2	0	0	0	0	0

[c] Includes one third grader who defined 'aunt' as cousin's mother, and one defined an uncle as having a niece or nephew.

[d] Includes one kindergartener who defined a brother as a cousin and one third grader who defined a brother as 'sister's brother.'

[e] Includes one kindergartener who defined a grandmother as a person and one as a mother.

Most of the kindergarteners experienced great difficulty defining the avuncular terms (aunt and uncle), with two describing an uncle as a 'friend.' Cousins were also described as 'friends' by 5 kindergarteners on each form. Both the sixth and third graders seemed to be in command of the recursive nature of the grandparental terms (parent of, parent of). Only one of the kindergarteners displayed awareness that the main criteria for being a sibling is mutual parentage.

CHAPTER IV

RESULTS: MANUFACTURED KINDS AND NATURAL KINDS

The responses to the manufactured and natural terms were crossstabulated according to the amended Benelli categories. The distributions of the percentages of responses for each word in the manufactured group can be seen in Table 9.

Table 9
Manufactured Kinds by Category of Response

	Car(A)	Car(B)	Pants(A)	Pants(B)
Perceptual	3.0	1.5	3.0	3.0
Functional	20.9	28.4	22.7	24.2
Percep./Func.	6.0	1.5	1.5	0
Categorical	4.5	0	0	0
Spec./Categ.	34.3	37.3	24.2	25.8
Gen./Categ.	0	0	0	0
Spec./Gen.	28.4	26.9	45.5	40.9
Examples	0	0	0	0
Irrel./NR	3.0	4.5	1.5	3.0

	Couch	Sofa	House	Home
Perceptual	1.5	0	6.1	0
Functional	13.5	7.8	18.2	23.9
Percep./Func.	4.5	0	0	3.0
Categorical	6.1	17.6	3.0	6.0
Spec.Cat.	33.3	35.3	21.2	16.4
Gen.Cat.	0	0	0	0
Spec.Gen.	33.3	25.5	48.5	50.7
Examples	0	0	0	3.0
Irrel./NR	7.6	13.7	3.0	0

Functional Definitions

Table 10 shows the percentages of subjects at each grade level giving functional definitions to the manufactured terms.

The manufactured terms, which elicited the greatest percentages of functional responses, were paired in terms of words that were assumed to be synonyms (house/home, couch/sofa).

Table 10

Percentages of Responses Using Functional Definitions for Manufactured Terms, by Grade

	Kindergarten		Third	
	A	B	A	B
Car(A)/Car(B)	52.4	66.7	11.5	19.2
Couch(A)/Sofa(B)	33.3	16.7	8.0	10.5
House(A)/Home(B)	50.0	52.4	7.7	15.4
Pants(A)/Pants(B)	55.0	65.5	11.5	11.5
Overall Mean	47.7	50.4	9.7	14.2

Note. Kindergarten n = 21, third grade n = 26, sixth grade n = 20.

Those pairs were entered into a MANOVA to examine possible differences in the extent to which they elicited functional definitions. Round, grade and gender were the between group variables and word and synonymy were the within subject factors. There was a significant main effect for grade [$F(2,55) = 10.81$, $p < .0005$], in that the kindergarteners gave a greater percentage of functional definitions than the third graders [$F(1,55) = 20.26$, $p < .0005$], who did not differ significantly from the sixth graders. There was also a significant main effect for type (i.e, building vs furniture) [$F(1,55) = 12.09$, $p = .001$], reflecting the greater number of functional definitions for buildings (house/home) than for furniture (couch/sofa).

There was a significant grade by wordtype interaction [$F(2,55) = 7.00$, $p = .002$]. The differences were particularly striking between the third and kindergarteners [$F(1,55) = 13.94$, $p < .0005$], since the kindergarteners gave

significantly more functional definitions for all of the words, except sofa. This result can probably be attributed to the fact that neither the kindergarteners nor the third graders appeared to be particularly familiar with that word.

When the two repeated words (car and pants) were compared, again the third graders and kindergarteners differed significantly [$F(1,55) = 38,31$, $p < .0005$]. There was also a significant gender by wordtype interaction produced by the fact that the females gave more functional definitions for car than the males on both forms [$F(1,55) = 5.24$, $p = .026$; however, only the Form B differences were significant. A significant grade by gender by wordtype interaction reflects the fact that while the kindergarten females gave more functional definitions for car, the males gave more for pants.

Semantic/syntactic Requirements

When the manufactured terms were analyzed to determine the extent to which they met semantic and syntactic requirements, car and pants, the two manufactured items that were repeated on both forms, yielded significant differences between the third graders and kindergarteners [$F(2,54) = 47.90$, $p < .0005$].

Couch/sofa and house/home were also compared, yielding a significant main effect for grade [$F(2,55) = 14.23$, $p < .0005$]--as grade increased, the overall percentage of responses which were both semantic and syntactically sound increased. On this dimension the third graders did not differ significantly from the kindergarteners [$F(1,55) = 11.71$, $p = .001$], but they

differed significantly from the sixth graders [$F(1,55) = 15.76$, $p < .0005$]. There was also a significant main effect for wordtype [$F(1,55) = 12.79$, $p = .001$], with the two furniture words (couch/ sofa) eliciting more semantically and syntactically adequate definitions than the two abode words (house/home).

A significant grade by word interaction [$F(2,55) = 6.02$, $p = .004$] reflects the fact that while the kinder-garteners gave the greatest percentages of syntactically and semantically sound responses for couch and home (17.5 and 19.6, respectively), the third and sixth graders gave more syntactically and semantically sound responses for couch (31.0 and 71.0, respectively) and sofa (31.0 and 84.0,respectively). Not only did the kindergarteners and third graders differ [$F(1,55) = 5.91$, $p = .018$], but the third and sixth graders did as well [$F(1,55) = 6.13$, $p = .0116$].

Superordination

In the manufactured wordtype group, both car and pants were repeated on both forms. Those two words were entered into a MANOVA with wordtype and form as within subject factors and round, grade, and gender as between subject factors. That analysis yielded a significant main effect for grade [$F(2,55) = 43.00$, $p < .0005$]. The significant differences, however, only obtained between the kinder-garteners and third graders [$F(1,55) = 85.62$, $p < .0005$]. There was also a signficant grade by gender by wordtype interaction reflecting the fact that the kindergarten females

gave more superordinate responses to the clothing item, while the males were more likely to give superordinate responses to the vehicle term.

When the couch/sofa and house/home pairs were similarly compared there were significant main effects for grade [$F(2,55) = 4.85$, $p < .0005$], and wordtype [$F(1,55) = 12.09$, $p = .001$], a significant grade by wordtype interaction [$F(1,55) = 7.00$, $p = .002$], and a significant word by wordtype interaction [$F(1,55) = 5.10$, $p = .028$].

The grade effect is attributable to the kinder-garteners' significantly lower percentage of categorical definitions overall, while 95 percent of the sixth graders' definitions of home were categorical. The grade by wordtype interaction can be seen in the fact that the kindergarteners and third graders performance was similar to the sixth graders for three of the words (couch, house, and home) they shared the kindergarteners's lack of familiarity with the word sofa. The word by wordtype interaction, again reflects the different treatment of couch and sofa and the similar treatment of house and home across grades. The natural kind terms were coded using the Benelli et al. categories and the distribution of the responses appear in Table 11 below.

The majority of the responces were concentrated in two categories--Specified Categorical and Specified Generic--except for the word island for which there were no Specified Generic responses.

Table 11
Natural Kinds by Category of Response

	Gold(A)	Gold(B)	Lime(A)	Lime(B)	Island(A)	Island(B)
Perceptual	4.5	1.5	1.5	1.6	9.1	7.7
Functional	6.0	4.6	10.6	19.4	13.6	10.8
Perc.Func.	4.5	0	9.1	1.6	1.5	3.1
Categorical	10.4	18.5	10.6	4.8	4.5	3.1
Spec.Cat.	29.9	21.5	40.9	40.3	28.8	29.2
Gen.Cat.	3.0	3.1	0	0	0	0
Spec.Gen.	25.4	35.4	22.7	30.6	0	0
Examples	7.5	9.2	0	0	4.5	3.1
Irrel./NR	9.0	6.2	4.5	1.6	6.1	7.7

	Rock(A)	Stone(B)	Sea(A)	Ocean(B)
Perceptual	12.1	4.6	7.5	7.8
Functional	13.6	15.4	17.9	14.1
Perc.Func.	3.0	0	1.5	4.7
Categorical	6.1	12.3	19.4	6.3
Spec.Cat.	24.2	26.2	25.4	37.5
Gen.Cat.	1.5	1.4	0	1.6
Spec.Gen.	30.3	38.5	23.9	21.9
Examples	1.5	0	0	0
Irrel/NR	6.1	1.5	4.5	6.3

Functional Definitions

The distribution of the percentages of fuctional definitions among the kindergarteners and third graders appear in Table 12.

Table 12
Percentages of Responses Using Functional Definitions for Natural Kinds Terms, by Grade

	Kindergarten		Third	
	A	B	A	B
Gold(A)/Gold(B)	14.3	10.5	3.8	0
Lime(A)/Lime(B)	25.0	58.8	7.7	3.8
Island(A)/Island(B)	30.0	15.8	11.5	15.4
Rock(A)/Stone(B)	35.0	47.4	3.8	3.8
Sea(A)/Ocean(B)	42.9	27.8	11.5	15.4

Note. Kindergarten n = 21, third grade n = 26.

Gold, lime, and island were the natural kind terms that were repeated for each subject at both administrations. The

results from both administrations were entered into a MANOVA with grade and gender as between subject variables and form as the within subject variable. The MANOVA yielded a significant main effect for grade [$F(1,61) = 8.96$, $p < .0005$]. The third and sixth graders, however, did not differ significantly. There was a significant main effect for word, with gold eliciting fewer functional definitions than the others on both forms. The significant grade by word interaction reflects the fact that the kindergarteners gave fewer functional responses for gold than for the other words. There were no significant form differences.

When the words which were thought to be synonyms (rock and stone) were compared for functional definitions, the results indicated significant differences between the third graders and kindergarteners [$F(1,61) = 22.39$, $p < .0005$]. Again, the third and sixth graders did not differ significantly.

Semantic/syntactic Requirements

Gold, lime and island, the three repeated words in the Natural Kind wordtype, were compared along the semantic dimension. The sixth graders gave significantly more responses that were semantically and syntactically adequate than the third graders [$F(1,55) = 8.88$, $p = .004$], who gave significantly more than the kindergarteners [$F(1,55) = 18.02$, $p < .0005$], yielding an overall significant main effect for grade [$F(2,55) = 13.45$, $p < .0005$]. There was also a significant main effect for wordtype, with lime yielding

significantly greater percentages of complete responses than the other two words [$F(2,110) = 5.27$, $p = .006$]. Form also yielded a significant main effect [$F(1,55) = 23.30$, $p < .0005$], with Form A yielding 41.3 percent of adequate answers, while Form B yielded 30.3 percent.

The two-way (grade by wordtype) interaction reflects the sixth graders worst performance for gold, while the third graders' worst performance was on island; the kindergarteners' performance did not vary significantly by wordtype. There was a significant grade by gender effect as well [$F(1,55) = 3.51$, $p = .037$]. This interaction can be attributed to the fact that the kindergarten males consistently produced more semantically and syntactically sound responses than the kindergarten females, while the third grade females outperformed the males. For the sixth graders, the gender differences, overall, were not significant.

A wordtype by form interaction [$F(2,110) = 4.25$, $p = .017$], a round by wordtype by form interaction [$F(2,110) = 3.28$, $p = .041$], a grade by wordtype by form interaction [$F(4,110) = 3.81$, $p = .006$], as well as a round by grade by wordtype by form interaction were also revealed. The wordtype by form interaction is attributable to the significantly greater percentages of adequate responses elicited by stone and sea than rock and ocean. The round by wordtype by form interaction reflects the fact that those subjects who responded to Form B first gave more complete responses for stone than for rock and for sea than for ocean

than those who responded to Form A first, who remained relatively consistent. The grade by wordtype by form interaction resulted from the fact that the sixth graders performed significantly better on Form A for the word gold while the kindergarteners performed significantly better on that form for the word lime, while the third graders' performance was more consistent over forms and wordtype.

The synonymous pairs (rock/stone and sea/ocean) were compared for semantic/syntactic adequacy. This comparison yielded a significant main effect for grade [$F(2,55) = 24.54$, $p < .0005$]. Again, the percentage of semantic and syntactically complete responses increased with grade level, and the kindergartners were significantly different from the third graders [$F(1,55) = 15.45$, $p < .0005$], who were significantly different from the sixth graders [$F(1,55) = 33.64$, $p < .0005$].

Superordinate Responses

The natural kind words that were assumed to be synonyms (sea/ocean and rock/stone) were entered into a MANOVA with round, grade, and gender as between subject factors and wordtype and synonymy as within subject factors. There was a significant main effect for class [$F(2,55) = 55.96$, $p > .0005$]. The third graders gave a significantly greater percentage of superordinate responses than the kindergarteners [$F(1,55) = 108.45$, $p > .0005$]; the difference between the sixth and third graders approached significance [$F(1,55) = 3.48$, $p = .067$]. The significant main effect for round [F

(1,55) = 4.44, p = .040] is indicative of the fact that those subjects who received Form B first gave the greatest percentage of categorical responses.

There was also a significant round by gender by wordtype interaction [F(1,55) = 8.69, p = .005], which is probably attributable to the fact that while there were no significant differences by round between the males and females for sea/ocean, the females gave significantly greater superordinate responses than the males for both rock and stone when they received Form A first, the males gave more superordinate responses for rock when they received Form B first, and there were no differences on stone when Form B was administered first.

These pairs also yielded significant round by grade by form interaction [F(1,55) = 4.77, p = .033] and wordtype by form [F(1,55) = 4.65, p = .035] interactions. When the kindergarteners received Form B first (the form including ocean and stone) they gave more categorical responses for ocean and stone, but not for rock and sea. The third graders who received Form B first gave significantly more superordinates for stone and rock, but not for sea and ocean. The wordtype by form interaction reflects the significantly greater number of superordinates elicited by stone as compared to rock, whereas there were no such differences between sea and ocean.

The natural kind terms that were repeated (gold, lime, and island) were entered into the same type of MANOVA and

yielded a significant main effect for grade [$F(2,55) = 34.13$, $p < .0005$], with significant differences between the kindergarteners and third graders [$F(1,55) = 67.57$, $p < .0005$], but not between the third and sixth graders. There was also a significant grade by gender by form interaction, but those differences only existed between the two youngest groups [$F(1,55) = 7.91$, $p = .007$]. Additionally a comparison between those two groups also yielded a significant round by grade by gender by form interaction [$F(1,55) = 6.82$, $p = .012$] as well as a grade by form by wordtype [$F(1,110) = 4.62$, $p = .034$].

The round by grade by form by wordtype interaction was also significant [$F(4,110) = 2.87$, $p = .026$], with the kindergarten vs third grade differences again varying significantly [$F(1,110) = 10.90$, $p = .0001$] while the third and sixth graders showing no significant differences. The significant round by grade by gender by form by wordtype interaction [$F(4,110) = 3.63$, $p = .008$] obtained, not only between the third graders and kindergarteners [$F(1,110) = 9.19$, $p = .003$] but also between the third and sixth graders [$F(1,110 = 5.33$, $p = .023$].

CHAPTER V

OVERALL RESULTS

The distribution of responses for each word was entered into a Chi-square analysis of independence by round, grade and gender. In the analysis by round, the only significant result was for gold (Round 1: Chi-square = 6.02, $p = .04$); there were no significant results for gender. The analysis yielded highly significant results by grade for all words on both forms, indicating that response category was not independent of grade. (See Table D-1.)

Functional Definitions

The numbers of functional definitions were averaged across categories and a MANOVA was performed to determine whether the mean numbers of functional definitions in each wordtype category varied significantly by round, grade and gender. The results of the MANOVA appear in Table D-3.

The significant grade effect reflects the fact that the kindergarteners gave a significantly greater percentage of functional definitions than the third graders for all wordtypes [$t=4.41$, $p < .0005$]. The significant wordtype effect reflects the fact that the manufactured kinds elicited a significantly greater percentage of functional responses than the other two wordtypes across round, grade and gender.

The grade by wordtype interaction reveals the fact that the kindergarteners varied significantly in the degree to

which they gave functional definitions in the different domains, while the third graders' responses were relatively more consistent across domains.

Semantic/Syntactic Requirements

The responses were combined into categories which reflected those which were 1: (1, 2 3) - neither semantically nor syntactically adequate; 2: (4 & 5) - both semantically and syntactically adequate, 3) only syntactically adequate, and 'Other'.

Chi-squares of independence by grade and gender were performed for each word to test whether those two factors were related to responses in those four category groups. The analyses by gender yielded no significant results. The results of those analyses by grade are presented in Table D-4. The highly significant results confirm the prediction that the distribution of responses in those categories would be dependent on grade.

According to Watson (1985), the use of the appropriate generic superordinate marks the shift from the fulfillment of just the syntactic/formal requirements of definitions (categories 6 and 7) to the fulfillment of semantic requirements as well (categories 4 and 5). To examine the relationship between the fulfillment of both types of requirements and round, grade and gender, responses were recoded into : 1) those meeting syntactic as well as semantic requirements (4 and 5); and 2) those meeting only the syntactic requirements of a formal definition (6 and 7).

Chi-squares of independence by round, gender and grade were performed between those two response groupings. Both round and gender proved to be independent of response category. The distribution of responses in those categories by grade for each word can be seen in Tables D-5 (semantic and syntactic) and D-6 (syntactic only). The results of the Chi-squares by grade appear in Table D-2.

Superordination

The responses for each word were combined to reflect those that contained superordinate terms (4-7) and those that did not (1-3). The percentages of responses for each word in categories 4 through 7 appear in Table D-7. In order to determine whether responses in those categories were independent of grade and gender, chi-squares of independence by grade and gender were performed for each word. There were no significant gender effects; the results for the analysis by grade can be seen in Table D-8. All of the chi-squares reached significant levels. It should be noted however, that when just the third- and sixth-graders were compared, there were no significant results. It appears that by grade three the subjects almost always provided definitions which fell into the categories which included some sort of superordinate structure.

The responses in categories 4 through 7 (those containing superordinate terms) were averaged across words within each wordtype (kinship, manufactured, and natural). A Multivariate repeated measures analysis of variance was

performed on those percentages, with round, gender and grade as the between group variables and wordtype and form as within subject factors. The results appear in Table D-9. As the Table shows, there were significant main effects for grade and wordtype, a significant grade x wordtype interaction and a significant grade by form by wordtype interaction.

The sixth graders produced the greatest percentages of superordinate terms and the third graders produced significantly greater percentages than the kindergarteners; however, the third and sixth graders did not differ significantly overall.

Across grade, round and form the kinship category elicited the greatest percentage of superordinate terms, followed by the manufactured terms, with the natural kinds eliciting the smallest percentage. It should also be noted that within both the third grade and kindergarten classes, there were significant form by wordtype interactions [$F(2,110) = 6.31$, $p = .003$] and [$F(2,110)$ 6.60, $p = .002$], respectively. Additionally, both the third and sixth graders showed significant differences by wordtype (i.e., the sixth graders consistently produced greater percentages of superordinates for the kinship and manufactured terms than for the natural kinds on both forms, whereas on Form B, the third graders produced equal percentages of superordinate responses for both the manufactured and natural terms. While the kindergarteners did not differ significantly between wordtypes on Form B, on Form A they produced significantly greater percentages of

superordinates for the kinship group than for either the manufactured or natural kinds.

Since there were no significant effects for gender and round, the results were collapsed over those variables. The results appear in Table 13.

Table 13

Percentages of Superordinate Responses (Categories 4 - 7) for Each Wordtype, by Class and Form

		Category		
		Kinship	Manufactured	Natural
Form A				
Class	(N)			
Kindergarten	(21)	36.7	23.3	25.1
Third	(26)	92.1	87.5	72.0
Sixth	(20)	100.0	95.8	73.1
Overall Mean	(67)	77.4	69.8	55.8
Form B				
Class				
Kindergarten	(21)	19.1	21.7	24.6
Third	(26)	85.1	77.8	78.6
Sixth	(20)	98.7	94.0	76.2
Overall Mean	(67)	68.4	65.7	60.6

The fact that the subjects gave responses including a superordinate term did not necessarily mean that they responded using an Aristotelian (AN X <u>is a</u> Y) format. Table 14 shows the numbers of subjects at each grade level who responded in the Aristotelian format (An X <u>isa</u> Y).[5]

[5] Only those responses where the <u>isa</u> is followed by a superordinate term are included in these numbers.

Table 14
Number of Subjects Responding in Aristotelian Format

Manufactured Kinds					
	Form A			Form B	
	Third	Sixth		Third	Sixth
Car	6	13	Car	6	10
Couch	4	10	Sofa	5	10
House	4	12	Home	3	7
Pants	2	7	Pants	2	2
Natural Kinds					
	Form A			Form B	
	Third	Sixth		Third	Sixth
Gold	5	8	Gold	3	8
Island	5	11	Island	5	12
Lime	5	8	Lime	5	10
Rock	3	7	Stone	3	5
Sea	2	10	Ocean	4	12
Kinship Terms					
	Form A			Form B	
	Third	Sixth		Third	Sixth
Aunt	2	10	Uncle	2	11
Brother	5	10	Sister	4	11
Cousin	3	10	Cousin	6	8
Daddy	3	9	Father	6	10
Grandmother	6	11	Grandfather	8	7
Mommy	4	12	Mother	4	8

Note. Kindergarten n = 21, third grade n = 26, sixth grade n = 20.

One of the interesting points revealed in this table is that while the sixth graders were relatively consistent in their responses to the artifacts, home elicited fewer Aristotelian definitions than house. Also, only one subject (a sixth grader) referred to a home as a house, and none referred to a house as a home. Among the third graders, three called a house "a building," but only one applied that category to home. One of the sixth graders called a home a habitat," but called a house "a structure."

The third graders gave the fewest Aristotelian definitions for pants, presumably the item with which they have the most intimate familiarity. In the same vein, among the natural kinds, ocean elicited twice as many Aristotelian definitions as sea.[6]

Although the numbers of sixth graders who gave the appropriate format for the word car, the same number of third and sixth graders (three each on Form A and two each on Form B) actually said "A car is a vehicle."

Six sixth-graders and one third-grader referred to a couch as "furniture," and the third grader was the only one who called it "a kind of furniture." For sofa, while four of the sixth graders referred to a sofa as "furniture," none of the third graders did, probably due to their relative lack of familiarity with the term. Although most of the third-graders had not mastered the Aristotelian format, one said "A type of furniture;" another described it as "a part of furniture, like a couch;" still another described it as "a kind of chair." Two described it as a couch.

Only two sixth graders on each form categorized pants as "clothing," which was very similar to the third grade results (one on Form A and two on Form B). However, the sixth graders had other superordinate terms for pants, such as "garment." On the other hand, one respondent who did not use the correct

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[6] The word sea is used more commonly in the Virgin Islands than ocean. As a matter, one goes "in the sea," rather than "to the beach.

syntactic form was the only one who indicated that pants were "Some kind of clothing. . ."

Of the five third graders who used the Aristotelian format in the definition of the word gold, one each categorized it as 'a rock,' 'a color,' 'a metal,' 'a treasure,' and 'money.' The sixth graders, however, used such terms as 'substance,' 'metal,' and 'element.' Two of the sixth graders defined gold as 'jewelry.'[7]

While the sixth graders followed their ISA format with such terms as 'a piece of land,' the third graders were more likely to say 'a place.' However, one third grader did define island as 'a tropical land.'

Four of the five third graders using the formal definitional structure also categorized lime as 'fruit,' one of them calling it 'a kind of fruit.' One even called it a 'citrus' fruit. (Most of the younger subjects also discussed the function of a lime as 'for cleaning fish' and the fact that it grows on a tree, probably since that is one of the common usages in the Virgin Islands and many families do in fact have lime trees).

Two of the three third graders in the table described both rock and stone as 'a non-living solid,' giving me the impression that perhaps they had discussed it recently in

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[7] It should be noted that in the Virgin Islands where most people wear gold jewelry, they often speak of wearing one's gold as opposed to wearing one's jewelry.

class. While the sixth graders gave definitions of both sea and ocean as 'a body of water,' the closest one third grader came was 'a water.'

The analysis of the kinship terms was of necessity somewhat different from the other domains. The fact that kinship terms are relational terms appears to change the way in which they are defined. For example, although comparatively large numbers of sixth graders used the Aristotelian format for their responses, few defined a daddy or a father as 'a man' (one and four, respectively). One defined a daddy as a 'male parent' and a mommy as a 'female parent.' The majority used relations, such as 'mother's husband.' Also worth mentioning, is the fact that most of the descriptions were preceded by definite articles (an uncle is your mother or father's brother), rather than the indefinite article (an uncle is a man . . .). Of course, all of the sixth graders and many of the third graders were able to give accurate defintions of the terms, but many in both grades did not use the Aristotelian format in their responses, even when they used the appropriate superordinate term.

While several of the kindergarteners produced responses in pseudo-Aristotelian formats (an X is) none of them followed with a superordinate term, i.e., a person, a woman, a man). However, although the Aristotelian format was missing, one each described a mommy as a parent and a lady, and one each stated that a brother, a cousin, and a daddy were "your family."

CHAPTER VI

DISCUSSION AND CONCLUSIONS

The present research explores children's abilities to give definitions of terms in three different domains--kinship terms, manufactured items (artifacts) and natural kinds. Aside from the expected age differences, it explores the influences of other factors such as ontological differences and metalinguistic awareness on definitional abilities. In the area of ontology, it explores the possibility that children's definitions may be influenced by the specific domain--do children describe social objects differently from artifacts and/or natural kinds?

A secondary issue is whether metalinguistic awareness develops in a wholistic manner or whether different aspects develop at different times in different domains. This discussion will address the results in terms of the above issues as they relate to each of the three domains.

One of the predictions of the study was that the production of functional definitions would be dependent on grade--the kindergarteners would produce significantly greater numbers of functional definitions than the third and sixth graders, regardless of wordtype. It was also predicted that the third graders would produce a greater percentage of functional definitions than the sixth graders. The kindergarteners did in fact produce significantly greater percentages of functional definitions than the third graders across domains; however, the differences betwen the

third and sixth graders were not significant. Moreover, the sixth graders rarely produced primarily functional definitions in any of the categories (although they did sometimes mention functional aspects in further elaborations on some of their definitions).

It should be noted, however, that both third graders and kindergarteners produced significantly greater percentages of functional definitions for the artifacts than for either kinship terms or natural kind terms. This finding is in keeping with the proposition that the nature of artifacts--the fact that they were manufactured to serve particular functions--makes their functional aspects a critical part of their definitions at all ages (Keil, 1987; Wierzbicka, 1984).

Another prediction was that parental terms of address (mommy and daddy) and terms of reference would elicit different types of definitions. The distribution of responses to those terms indicate that this prediction was confirmed. For example, the terms of reference were more likely than terms of address to be defined in terms of their biological aspects. Interestingly, daddy was never defined in biological terms, while mother, and mommy (and father only by two sixth-graders) were. This phenomenon can probably be explained by the fact that the mothers' biological function is obvious, even to third graders.

Father was also more likely than daddy to be defined in terms of his relationship to the mother (mother's husband).

Additionally, daddy and mommy were defined as 'father' and 'mother,' respectively, to a much greater extent than father and mother were defined as 'mommy' and 'daddy.' It may be that the daddies and mommies are special cases of father and mother. The fact that one-third of the subjects defined a daddy as a father and nearly one-quarter defined a mommy as a mother may indicate that the two terms denote the same referent, but they may in fact have different connotations.

Haviland and Clark's (1974) conclusion that experience may play a greater part in younger children's concepts of kinship terms appear to be bourne out in the fact that the kindergarteners as well as third graders described cousins, uncles, brothers, and sisters as 'friends.' One sixth grader even defined a cousin as a friend. This finding also lends credence to Fischer et al.'s (1983) notion that young children learn 'social role categories' as opposed to semantic components.

The idea of semantic complexity, however, cannot be dismissed. Cousin (child of child of parent of parent of ego) seemed to be an area of particular difficulty for the younger children, perhaps because of its double recursion (Haviland and Clark, 1974). By the third grade (about 9 years of age for this sample) the subjects were able to express this relationship virtually as well as the sixth graders. Interestingly, when the third graders defined 'sister,' they were more likely to mention gender than common parentage.

Moreover, as Table 7 shows, very few subjects defined any of the parental terms as 'parents.'

Although Scheffler (1976) contends that genealogical relationships ascribe the social ones, genealogy did not appear to be a salient aspect of the definitions, even for the older children. The third and sixth graders were much more likely to define their parents in terms of marriage, i.e., father= mother's husband. These results are more in keeping with Scheffler's (1976) and Carter's (1984b) proposals of multiple determinants of the meanings of kinship terms.

The prediction that the terms of address would produce more functional definitions than the terms of reference was not confirmed since the kindergarteners gave more functional definitions for both parental terms of reference. One possible explanation is that the younger subjects appeared to give functional definitions for the terms with which they were least familiar, and therefore unable to "decontextualize" (Watson, 1985). This may also explain the finding that the female subjects were more likely than the males to give functional definitions for 'car.' As far as the use of superordination is concerned, not only did the three groups vary significantly, but the type of word being defined also appeared to influence the use of superordinate terms. Given the relational nature of kinship terms, it is certainly possible to give adequate definitions without utilizing the type of hierchical organization required by both the artifacts

and natural kinds. This is evident in the fact that regardless of grade, the response to the kinship terms was primarily relational. It should be noted, however, that what Piaget (1926) would consider a very unsophisticated definition for a kinship term (e.g., boy for brother) would be considered a categorical response in this analysis since 'boy' is in fact a superordinate term for brother.

The characteristic to defining shift (Keil and Batterman, 1984) appears to be dependent not only on age, but on the nature of the word. A comparison between the manufactured and natural kinds indicates that although the third graders defined the natural kinds more in terms of their necessary and sufficient attributes, they still defined the manufactured terms with regard to their functional aspects.

Researchers agree that giving an adequate definition requires not only fulfilling the syntactic requirements of form of a definition (Benelli categories 6 and 7), but also fulfilling certain semantic requirements (categories 4 and 5). The results indicate that the kindergartners, in most instances, were unable to meet either requirements of giving a definition. By the third grade, however, most subjects were able to meet at least the syntactic requirements.

On most of the measures, the third- and sixth-graders were not significantly different, but when it came to the semantic/syntactic aspect there was a distinguishable developmental sequence. In other words, the third graders and sixth graders were relatively similar in their abilities to

give categorical responses to most of the terms and both groups were signigicanlty less likely than the kindergarteners to give functional responses; the two groups differed in their ability to provide semantically and syntactically adequate definitions. This finding supports the proposition that metalinguistic awareness is likely to consist of separate abilities (Saywitz and Wilkinson, 1982), rather than a unitary development (deVilliers and deVilliers, 1974).

The rationale for the present study stemmed from a belief that developmental differences in children's definitions of words were a result of several factors, rather than a wholistic characteristic to definining shift. Keil (1987) argues ". . . against the posibilities that it is either a general response strategy shift or that it reflects a general stage of cognitive development" (Keil, 1987, p. 177). Keil further states that "there clearly is a developmental shift for natural kinds and not for artifacts" (p. 187), but it is possible that the apparent developmental differences are due to learning the semantic/ syntactic requirements of responding to a request for a verbal definition.

The ontology of the word appears to have some influence on the manner in which the definition is expressed. For example, items that are manufactured (artifacts) appear to elicit responses which are functional in nature, while natural kinds seem to elicit more hierarchically organized definitions (Wierzbicka, 1984).

Kinship terms, on the other hand elicit relational definitions, even from the youngest subjects. Moreover, the basis for the definitions do not appear to be genealogical factors (Scheffler, 1976) but rather interpersonal relationships (Carter, 1984). Even the subjects who were aware of the genealogical aspects of parenthood, did not appear to consider them of particular salience for the definitions. If, as Schneider (1970) suggests, American kinship terms are defined on the basis of biogenetic substance and/or interpersonal relationships, it is possible that what children initially learn about kinship terms is a system of deixis (Carter, 1974; Bean, 1975), or social role categories (Watson and Magott-Kwam, 1983 & 1984).

On the matter of denotation and connotation, particularly in the area of kinship terms, while it is clear that both father and daddy, and mother and mommy denote the same referent for the children in this sample, the connotations are different--all daddies may be fathers, but all fathers are not daddies. Moreover, a house is not a home.

Although the effects of experience, were not explicitly demonstrated, the extent to which the subjects tended to describe mothers in terms of producing children, may be an implicit confirmation its effects. Additionally, experiential factors appear to be at least a contributing factor to the within-domain 'decalage' exhibited by the younger subjects.

Before definitive conclusions can be drawn with respect to these issues, several other factors need to be considered in planning further research.

1. While the study was conducted in the United States Virgin Islands, a sample from the continental United States would probably provide additional information. It appears that many of the children in this study were first- or second-generation immigrants from other islands in the Eastern Caribbean with a strong British influence. It is possible that in British English father and mother are not considered terms of reference, but terms of address.

2. Experiential data should be systematically collected and compared with meaning data, particularly with regard to kinship, since many children do not live in traditional nuclear families.

3. An adult sample should be added to ascertain whether genealogy becomes a more relevant factor in verbal definitions of kinship terms in a mature semantic system.

Appendix A

Componential Solutions of Kinship Terms

1. Wallace and Atkins' (1960)

	c1		c2		c3	
	a1	a2	a1	a2	a1	a2
b1	grandfather	grandmother				
b2	father	mother	uncle	aunt		
b3	(ego)		brother	sister	cousin	
b4	son	daughter				
b5	grandson	granddaughter	nephew	niece		

a1 - male
a2 - female
b1 - 2 generations above ego
b2 - one generation above ego
b3 - ego's generation
b4 - 1 generation below ego
b5 - 2 generations below ego
c1 - lineal
c2 - co-lineal
c3 - ablineal

2. Romney and D'Andrade (1964)

	Direct		Collateral	
	M	F	M	F
+2	GrFa	GrMo		
-2	GrSo	GrDa	Un	Au
+1	Fa	Mo		
-1	So	Da	Ne	Ni
0	Br	Si	Co	

Appendix B

Stimulus List

KINSHIP	NATURAL	MANUFACTURED
Interview 1		
aunt	gold	car
brother	island	couch
cousin	lime	house
daddy	rock	pants
grandmother	sea	
mommy		
Interview 2		
cousin	gold	car
father	island	home
grandfather	lime	pants
mother	ocean	sofa
sister	stone	
uncle		
REPEATED TERMS		
cousin	gold	car
	lime	pants
	island	

REFERENCE-ADDRESS		SYNONYMS	
mother-mommy	ocean-sea		couch-sofa
father-daddy	rock-stone		house-home

GENDER VARIATION

sister-brother
aunt-uncle
grandmother-grandfather

PAIRS

aunt-uncle	brother-sister	car-car	couch-sofa
cousin-cousin	daddy-father	grandmother-grandfather	
house-home	island-island	mommy-mother	
pants-pants	sea-ocean	rock-stone	lime-lime
gold-gold			

APPENDIX C - DATA FORMS

DATA FORM

INTERVIEW A

NAME _____ GRADE/CLASS_____ DOB __/__/__

NO. OF BROTHERS_____ NO. OLDER _____ NO. YOUNGER _____

NO. OF SISTERS _____ NO. OLDER _____ NO. YOUNGER _____

GENDER_____

My name is Agatha Nelson, What's yours? I am doing some school work and I need some help. I need to know what children your age think about some things? Do you think that you can help me?
I am going to tell you some words and I would like you to tell me what you think they mean.

Can you tell me what a family is?

_____

_____

Notes:

What is an aunt?_____

What is a brother? _____

What is a car? _____

What is a couch? _____

What is a cousin? _____

What is a daddy?_____

What is gold?_____

What is a grandmother?_____

What is a house?_____

What is an island?_____

What is a lime?_____

What is a mommy?_____

What are pants?_____

What is a rock?_____

What is a sea?_____

INTERVIEW B

Remember when I came and talked with you before? Well, I cannot find the papers that I wrote down the anwers on, so I need to ask you the questions again. Will you help me again?

What is a car?_____

What is a cousin?_____

What is a father?_____

What is gold? _____

What is a grandfather?_____

What is a home?_____

What is an island?_____

What is a lime? _____

What is a mother?_____

What is an ocean?_____

What are pants? _____

What is a sister? _____

What is a sofa?_____

What is a stone?_____

What is an uncle?_____

APPENDIX D
TABLES

Table D-1
Relationship Between Response Category and Grade

Form A				
Word	N	Chi-Square	DF	Significance
Natural				
Gold	67	43.993	16	.0002
Lime	66	37.762	12	.0002
Island	66	55.198	14	<.00005
Rock	66	54.452	18	<.00005
Sea	67	57.988	12	<.00005
Manufactured				
Car	67	49.933	14	<.00005
Couch	66	48.763	12	<.00005
House	66	51.324	10	<.00005
Pants	66	48.798	12	<.00005
Kinship				
Aunt	61	56.559	14	<.00005
Brother	67	64.054	12	<.00005
Cousin	66	50.034	12	<.00005
Daddy	66	48.020	14	<.00005
Grandma	66	53.960	16	<.00005
Mommy	66	43.627	14	.0001

Form B				
Word	N	Chi-Square	DF	Significance
Natural				
Gold	65	43.658	14	.0001
Lime	62	48.823	12	<.00005
Isle	65	52.905	14	<.00005
Ocean	64	54.255	14	<.00005
Stone	65	57.878	12	<.00005
Manufactured				
Car	67	71.306	10	<.00005
Home	67	32.669	8	.0001
Pants	66	63.375	12	<.00005
Sofa	51	31.239	8	.0001
Kinship				
Cousin	66	45.007	14	<.00005
Father	65	42.272	10	<.00005
Grandpa	64	50.039	12	<.00005
Mother	66	51.506	14	<.00005
Sister	65	58.500	12	<.00005
Uncle	65	58.854	12	<.00005

Table D-2
Chi-Squares of Responses in Syntactic Only vs Syntactic/Semantic Responses

Form A			
Word	df	Chi-Square	Significance
Natural Kinds			
Gold	2	1.58239	ns
Lime	2	1.89711	ns
Island	2	13.39138	.0012
Rock	2	10.84200	.0044
Sea	2	8.56065	.0138
Manufactured Kinds			
Car	2	8.03276	.0180
Couch	2	6.34711	.0419
House	2	37.56125	<.00005
Pants	2	11.94386	.0025
Kinship Terms			
Aunt	2	7.17428	.0277
Brother	2	16.39554	.0003
Cousin	2	8.67972	.0130
Daddy	2	12.75449	.0017
Grandmother	2	8.40363	.0150
Mommy	2	10.44574	.0054

Form B			
Word	df	Chi-Square	Significance
Natural Kinds			
Gold	2	.63718	ns
Lime	2	10.92613	.0042
Island	2	11.15436	.0038
Ocean	2	10.68884	.0048
Stone	2	12.83315	.0016
Manufactured Kinds			
Car	2	25.39048	<.00005
Home	2	2.48005	ns
Pants	2	14.83153	.0006
Sofa	2	5.58405	.0613
Kinship Terms			
Cousin	2	3.16006	ns
Father	2	2.71085	ns
Grandfather	2	6.17281	.0457
Mother	2	8.11614	.0173
Sister	2	10.79059	.0045
Uncle	2	20.64873	<.00005

Table D-3
Analysis of Variance of Functional Responses
Across Categories by Round, Grade and Gender

Source	df	Sum of Squares	F-Ratio
Between Subjects			
Round	1	.01	.03
Grade	2	6.67	16.31***
Gender	1	.04	.20
Round x Grade	2	.37	.90
Round x Gender	1	.07	.35
Grade x Gender	2	.15	.37
Round x Grade x Gender	2	.14	.34
Within Subjects			
Wordtype	2	.54	7.44**
Round x Wordtype	2	.02	.22
Grade x Wordtype	4	.60	4.15*
Gender x Wordtype	2	.00	.01
Round x Grade x Wordtype	4	.22	1.50
Round x Gender x Wordtype	2	.01	.07
Grade x Gender x Wordtype	4	.15	1.05
Round x Grade x Gender x Wordtype	4	.07	.48
Form	1	.09	3.76
Round x Form	1	.03	1.11
Grade x Form	1	.05	1.07
Gender x Form	1	.01	.25
Round x Grade x Form	2	.04	.80
Round x Gender x Form	1	.00	.01
Grade x Gender x Form	2	.05	1.00
Round x Grade x Gender x Form	2	.05	1.16
Wordtye x Form	2	.08	2.67
Round x Wordtype x Form	2	.00	.04
Grade x Wordtype x Form	4	.12	2.07
Gender x Wordtype x Form	2	.00	.09
Round x Grade x Wordtype x Form	4	.04	.64
Round x Gender x Wordtype x Form	2	.01	.36
Grade x Gender x Wordtype x Form	1	.01	.12
Round x Grade x Gender x Wordtype x Form	4	.05	.92

* p = .001.
** p > .005.
*** p > .0005.

Table D-4
Chi-Squares of Responses in Categories 1,2,3; 4,5; and 6,7 for Each Word, by Grade

Source	df	Chi-Square	Significance
Form A			
Natural			
Gold	6	27.19	.0001
Lime	6	27.74	.0001
Island	6	36.81	>.00005
Rock	6	45.05	>.00005
Sea	6	42.31	>.00005
Manufactured			
Car	6	37.13	>.00005
Couch	6	40.42	>.00005
House	6	42.36	>.00005
Pants	6	47.92	>.00005
Kinship			
Aunt	6	47.91	>.00005
Brother	6	51.33	>.00005
Cousin	6	33.53	>.00005
Daddy	6	31.85	>.00005
Grandmother	6	41.37	>.00005
Mommy	6	35.68	>.00005
Form B			
Word	df	Chi-Square	Significance
Natural			
Gold	6	29.04	.0001
Lime	6	46.85	>.00005
Island	6	34.75	>.00005
Ocean	6	41.06	>.00005
Stone	6	37.10	>.00005
Manufactured			
Car	6	65.87	>.00005
Home	6	17.82	.0013
Pants	6	53.48	>.00005
Sofa	6	28.75	.0001
Kinship			
Cousin	6	33.81	>.00005
Father	6	35.82	>.00005
Grandfather	6	48.72	>.00005
Mother	6	40.30	>.00005
Sister	6	44.84	>.00005
Uncle	6	49.82	>.00005

Table D-5
Responses Fulfilling Syntactic and Semantic Requirements
by Grade

	Kg.	Third	Sixth	Total
Form A				
Syntactic/Semantic				
	n=21	n=26	n=20	n=67
Natural				
Gold	3 (14.3)	12 (46.2)	12 (60.0)	27 (40.3)
Lime	4 (19.0)	14 (53.8)	16 (80.0)	34 (50.7)
Island	3 (14.3)	5 (19.2)	14 (70.0)	22 (32.8)
Rock	2 (9.5)	5 (19.2)	13 (65.0)	20 (29.9)
Sea	4 (19.0)	9 (34.6)	17 (85.0)	30 (44.8)
Manufactured				
Car	2 (9.5)	9 (34.6)	15 (75.0)	26 (38.8)
Couch	3 (14.3)	8 (30.8)	15 (75.0)	26 (38.8)
House	2 (9.5)	6 (23.1)	8 (40.0)	16 (23.9)
Pant	0	4 (15.4)	12 (60.0)	16 (23.9)
Kinship				
Aunt	2 (9.5)	17 (65.4)	20(100.0)	39 (58.2)
Brother	7 (33.3)	12 (46.2)	20(100.0)	39 (58.2)
Cousin	4 (19.0)	14 (53.8)	19 (95.0)	37 (55.2)
Daddy	8 (38.1)	12 (46.2)	20(100.0)	40 (59.7)
Grandma	6 (28.6)	16 (61.5)	20(100.0)	42 (62.7)
Mommy	8 (38.1)	15 (57.7)	20(100.0)	43 (64.2)
Form B				
Natural				
Gold	3 (14.3)	12 (46.2)	11 (55.0)	26 (38.8)
Lime	1 (4.8)	11 (42.3)	16 (80.0)	28 (41.8)
Island	2 (9.5)	5 (19.2)	14 (70.0)	21 (31.3)
Ocean	3 (14.3)	8 (30.8)	17 (85.0)	28 (41.8)
Stone	5 (23.8)	5 (19.2)	15 (75.0)	25 (37.3)
Manufactured				
Car	0	6 (23.1)	19 (95.0)	25 (37.3)
Home	4 (19.0)	4 (15.4)	7 (35.0)	15 (22.4)
Pants	0	4 (15.4)	13 (65.0)	17 (25.4)
Sofa	2 (9.5)	8 (30.8)	17 (85.0)	27 (40.3)
Kinship				
Cousin	3 (14.3)	16 (61.5)	17 (85.0)	36 (53.7)
Father	4 (19.0)	16 (61.5)	18 (90.0)	38 (56.7)
Grandpa	0	15 (57.7)	18 (90.0)	33 (49.3)
Mother	4 (19.0)	12 (46.2)	19 (95.0)	35 (52.2)
Sister	2 (9.5)	13 (50.0)	19 (95.0)	34 (50.7)
Uncle				

Table D-6
Responses Containing Syntactic Responses Only
By Grade

	Syntactic Only			
	Kg.	Third	Sixth	Total
	n=21	n=26	n=20	n=67
Natural				
Gold	3 (14.3)	11 (42.3)	5 (25.0)	19 (28.4)
Lime	3 (14.3)	8 (30.8)	4 (20.0)	15 (22.7)
Island	2 (9.5)	15 (57.7)	4 (20.0)	21 (31.8)
Rock	1 (4.8)	16 (61.5)	4 (20.0)	21 (31.8)
Sea	1 (4.8)	12 (46.2)	3 (15.0)	16 (23.9)
Manufactured				
Car	3 (14.3)	13 (50.0)	3 (15.0)	19 (28.4)
Couch	3 (14.3)	14 (56.0)	5 (25.0)	22 (33.3)
House	2 (9.5)	18 (69.2)	12 (60.0)	32 (48.5)
Pants	4 (19.0)	19 (73.1)	7 (35.0)	30 (45.5)
Kinship				
Aunt	1 (4.8)	7 (26.9)	0	8 (11.9)
Brother	1 (4.8)	13 (50.0)	0	14 (20.9)
Cousin	4 (19.0)	9 (34.6)	1 (5.0)	14 (20.9)
Daddy	3 (14.3)	11 (42.3)	0	14 (20.9)
Grandma	1 (4.8)	8 (30.8)	0	9 (13.4)
Mommy	2 (9.5)	10 (38.5)	0	12 (17.9)

Form B

	Syntactic Only			
	Kg.	Third	Sixth	Total
Natural				
Gold	4 (19.0)	13 (50.0)	8 (40.0)	25 (37.3)
Lime	3 (14.2)	14 (53.8)	2 (10.0)	19 (28.4)
Island	4 (19.0)	15 (57.7)	4 (20.0)	23 (34.3)
Ocean	1 (4.8)	12 (46.2)	2 (10.0)	15 (22.4)
Stone	3 (14.2)	18 (69.2)	5 (25.0)	26 (38.8)
Manufactured				
Car	3 (14.2)	15 (57.7)	0	18 (26.9)
Home	5 (23.8)	17 (65.4)	12 (60.0)	34 (50.7)
Pants	3 (14.2)	19 (73.1)	5 (25.0)	27 (40.3)
Sofa	2 (9.5)	8 (30.8)	3 (15.0)	13 (19.4)
Kinship				
Cousin	2 (9.5)	7 (26.9)	2 (10.0)	11 (16.4)
Father	1 (4.8)	7 (26.9)	2 (10.0)	10 (14.9)
Grandpa	1 (4.8)	7 (26.9)	2 (10.0)	10 (14.9)
Mother	1 (4.8)	9 (34.6)	1 (4.8)	11 (16.4)
Sister	2 (9.5)	9 (34.6)	0	11 (16.4)
Uncle	2 (9.5)	10 (38.5)	0	12 (60.0)

Table D-7
Responses In Categories Including Superordinate Terms
For Each Word, by Grade

	Form A		
	Kg.	Third	Sixth
	n=21	n=26	n=20
Natural Kinds			
Gold	6 (28.6)	23 (88.5)	17 (85.0)
Lime	7 (33.3)	22 (84.6)	20 (100.0)
Island	0	20 (76.9)	18 (90.0)
Rock	3 (14.3)	21 (80.8)	17 (85.0)
Sea	5 (23.8)	21 (80.8)	20 (100.0)
Manufactured Kinds			
Car	5 (23.8)	22 (84.6)	18 (90.0)
Couch	6 (28.6)	22 (84.6)	20 (100.0)
House	0	24 (92.3)	20 (100.0)
Pants	4 (19.0)	23 (88.5)	19 (95.0)
Kinship Terms			
Aunt	3 (14.3)	24 (92.3)	20 (100.0)
Brother	8 (38.1)	25 (96.2)	20 (100.0)
Cousin	8 (38.1)	23 (88.5)	20 (100.0)
Daddy	11 (52.4)	23 (88.5)	20 (100.0)
Grandma	7 (33.3)	24 (92.3)	20 (100.0)
Mommy	10 (47.6)	25 (96.2)	20 (100.0)
	Form B		
	Kg.	Third	Sixth
Natural Kinds			
Gold	7 (33.3)	25 (96.2)	19 (95.0)
Lime	4 (19.0)	25 (96.2)	18 (90.0)
Island	6 (28.6)	20 (76.9)	18 (90.0)
Ocean	4 (19.0)	20 (76.9)	19 (95.0)
Stone	8 (38.1)	23 (88.5)	20 (100.0)
Manufactured Kinds			
Car	3 (14.3)	21 (80.8)	19 (95.0)
Home	9 (42.9)	21 (80.8)	19 (95.0)
Pants	3 (14.3)	23 (88.5)	18 (90.0)
Sofa	4 (19.0)	16 (88.9)	20 (100.0)
Kinship Terms			
Cousin	5 (23.8)	23 (88.5)	19 (95.0)
Father	5 (23.8)	23 (88.5)	20 (100.0)
Grandfather	1 (4.8)	22 (84.6)	20 (100.0)
Mother	5 (23.8)	21 (80.8)	20 (100.0)
Sister	4 (19.0)	22 (84.6)	19 (95.0)

Table D-8
Relationship Between Use of Superordinates and Grade

Form A				
Word	N	Chi-Square	DF	Significance
Natural				
Gold	67	43.993	16	.0002
Lime	66	37.763	12	.0002
Island	66	55.200	14	<.00005
Rock	66	54.452	18	<.00005
Sea	67	57.988	12	<.00005
Manufactured				
Car	67	49.933	14	<.00005
Couch	66	48.763	12	<.00005
House	66	51.324	10	<.00005
Pants	66	48.798	12	<.00005
Kinship				
Aunt	61	56.559	14	<.00005
Brother	67	64.054	12	<.00005
Cousin	66	50.034	12	<.00005
Daddy	66	48.020	14	<.00005
Grandmother	66	53.960	16	<.00005
Mommy	66	43.627	14	.0001

Form B				
Word	N	Chi-Square	DF	Significance
Natural				
Gold	65	28.794	6	.0001
Lime	62	35.010	4	<.00005
Island	65	21.532	6	.0015
Ocean	64	27.624	4	<.00005
Stone	65	22.182	4	.0002
Manufactured				
Car	67	35.203	4	.0000
Home	67	15.439	2	.0004
Pant	66	35.680	8	<.00005
Sofa	51	22.554	4	.0002
Kinship				
Cousin	66	30.543	6	<.00005
Father	65	32.351	4	.0000
Grandfather	64	44.593	6	<.00005
Mother	66	29.984	6	<.00005
Sister	65	32.17682	6	<.00005
Uncle	65	34.459	6	<.00005

Table D-9
MANOVA
Percentages of Responses Containing Superordinate Terms, by Round, Grade and Gender

Source	df	Sum of Squares	F-Ratio
Between Subjects			
Round	1	.16	.65
Grade	2	30.44	60.54***
Gender	1	.07	.30
Round x Grade	2	.20	.40
Round x Gender	1	.16	.16
Grade x Gender	2	.07	.13
Round x Grade x Gender	2	.12	.24
Within Subjects			
Wordtype	2	1.26	18.17***
Round x Wordtype	2	.02	.24
Grade x Wordtype	4	.63	4.52**
Gender x Wordtype	2	.07	.98
Round x Grade x Wordtype	4	.12	.86
Round x Gender x Wordtype	2	.0	.19
Round x Form x Wordtype	2	.11	2.68
Grade x Form x Wordtype	4	.20	2.56*
Grade x Gender x Wordtype	4	.16	1.14
Gender x Form x Wordtype	2	.12	2.93
Round x Grade x Gender x Wordtype	4	.09	.61
Round x Grade x Form x Wordtype	4	.04	.53
Round x Gender x Form x Wordtype	2	.04	1.00
Form	1	.09	3.72
Round x Form	1	.02	.78
Grade x Form	2	.06	1.30
Gender x Form	1	.03	1.07
Round x Grade x Form	2	.06	1.18
Grade x Gender x Form	2	.07	1.43
Grade x Gender x Form x Wordtype	4	.15	1.92
Round x Class x Gender x Form	2	.03	.67
Round x Grade x Gender x Form x Wordtype	4	.13	1.67

* p < .05
** p < .005
***p < .0005

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