Rethinking the Acquisition of Kinship Terms

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This paper reconsiders the predominant views on the acquisition of kinship terms and challenges the argument that the ontogenesis of these terms reflects global processes of semantic development in which weakly constrained initial representations evolve in discreet stages toward mature representations. Instead, through a re-examination of existing experimental data, an alternative account of kinship acquisition is offered which attributes to the child a significantly greater native conceptual sophistication and argues that age-dependent advances in kinship semantics are constrained by *a priori* hypotheses the child maintains about human beings in groups rather than through changes in the capacity to handle logical relations or semantic features.

INTRODUCTION

A large body of experimental and interpretive literature now exists which is concerned with the acquisition and mental representation of kinship terms. Virtually all this work proceeds from the assumptions (i) that kinship terms form a distinct lexical domain, and (ii) that this domain can be exhaustively characterised by a limited number of genealogically derived predicates. The developmental literature (which is almost exclusively psychological and experimental in contrast to the predominantly anthropological and interpretive literature on mature representations) additionally presumes (iii) that the development of kinship terms involves the operation of a general learning device that ranges over a large number of domains

and underwrites the evolution of a wide variety of cognitive and semantic skills.

In contrast, the present paper will challenge (ii) and (iii) by attempting to show that the existing experimental data are more accordant with an alternative perspective, one which hypothesises a richer and more specific native endowment on the child's part. We will argue that previous re- search, by having focused on what the child does not know of the adult meaning of the terms, has difficulty accounting for the fact that even quite young children appropriately use and respond to utterances containing a wide variety of kinship terms. Additionally we will argue that the terms' development is not characterised by progression toward genealogically derived predicates but involves the recasting of intuitive beliefs about the social world.

The approach offered here is derived in part from recent work in developmental psychology that argues that different domains of conceptual knowledge are associated with unique initial states and distinct conditions of acquisition (Keil, 1988, 1981; Gelman & Brown, 1986; Carey, 1985; Kagan, 1981). This perspective places greater emphasis on the nature of early representational constraints and "the boundary conditions that limit the nature of the change" over time in cognitive skills (Keil, 1981: 159). It thus posits a significantly less powerful learning device while arguing for enhanced but domain-specific native endowments (Atran & Sperber, 1987 (Note 1)).

In what follows I will attempt to link the divergent trends in the analysis of the acquisition of kinship terms to a common set of assumptions about initial states and conditions of acquisition. Furthermore, I will try to show that this common thread has left a number of seemingly minor but critical empirical patterns unaccounted for. I will argue that the alternative view presented here captures not only the empirical patterns captured by other approaches but these paradoxical findings as well.

I. KINSHIP AND THE ONTOGENESIS OF LOGIC

The bulk of the existing psychological and psycholinguistic literature on the acquisition of kin terms flows from an early Piagetian probe into the logic of two kinship terms, *brother* and *sister*. Piaget was not concerned with kinship *per se*, even less so with the question of whether kinship was a lexically or conceptually unique domain. Rather he was interested in the child's developing logical skills. Accordingly he turned his attention not only to production tasks involving verbal definition (discussed later), but to comprehension tasks which supposedly implicated different levels of logi- cal understanding. His study included the following experimental tasks:

1. The three-brothers test in which 44 subjects (aged 9–12 years) were asked to find the "contradiction" between the proposition (i) that there are three brothers (sisters in the case of female subjects) in a family (Paul, Ernest, and me), and (ii) the judgment that "I have three brothers" (1928: 74).

2. *Brother* and *sister* test of the logic of relations: 240 subjects (100 female, 140 male, aged 4–12 years) were asked a series of questions: (i) How many brothers have you? And how many sisters? [Let us suppose that the child has a brother A and a sister B.] And how many brothers has A? And how many brothers has B? And how many sisters? (ii) How many brothers are there in the family? How many sisters? How many brothers and sisters altogether? (iii) There are three brothers in a family: Auguste, Alfred, and Raymond. How many brothers has Auguste? And Alfred? And Raymond? (iv) Are you a brother [or sister]? What is a brother [or sister]? (v) Ernest has three brothers, Paul, Henry, and Charles. How many brothers has Paul? And Henry? And Charles? (vi) How many brothers are there in this family? (1928: 98).

Piaget reports marked age-dependent differences in performance for both tasks. The results of the second series, which used subjects drawn from the widest range, are as follows: 19% of the 4–5-year-olds responded correctly, 24% of the 6–7-year-olds, 55% of the 8–9-year-olds, 87% of the 10–11-year-olds, and 100% of the 12-year-olds (1928: 85). Piaget ascribes the younger children's poorer performance to their "naive realism" and "infantile egocentrism," that is their inability to adopt the point of view of another person (ibid., pp. 1, 86–95).

The notion that changes in egocentricity play a critical role in the development of kinship terms has generally been echoed in most subsequent research on and discussion of kin term acquisition. Elkind (1962) replicated Piaget's study with 210 American children. Other studies have combined definition–elicitation with other protocols (for Australian children) Danziger, 1957: 229; (American children) Burling, 1970: 18; Swartz and Hall, 1972: 239; (Hausa children) LeVine and Price-Williams, 1974: 34; (Hawaiian children) Price-Williams, Hammond, Edgerton and Walker, 1978: 320–321. Two studies using comprehension data also report support for the Piagetian position: (Mayan children) Greenfield and Childs, 1978: 355; (English children) Macaskill, 1981, 1982 (cf. Chambers & Tavuchis, 1976; Carter, 1984).

There remain, nonetheless, at least two reasons (which to a certain extent are contradictory) for examining Piaget's original studies in some detail. On the one hand, in spite of the apparently broad-based and cross-cultural support for Piaget's conclusion, the claim that the young child is incapable of appreciating a perspective other than his own has been

challenged both generally (Macnamara, 1982; Donaldson, 1978: 58; Carey, 1985) and specifically with respect to kinship terms (Carter, 1984). On the other hand, as the number of studies cited in the paragraph above attest, Piaget's work has exerted a considerable substantive and methodological influence on subsequent research concerned with the development of kinship semantics. Thus, reservations following from Piaget's work are applicable to a larger body of research.

We will consider several specific issues: (i) Does Piaget present either normative or experimental evidence indicating that children spontaneously misunderstand or misuse kinship terms in ways consistent with the proposed immature logical incongruities? (ii) How valid are his measures? Are the levels of competence observed in naturalistic contexts consistent with the obtained results? (iii) Piaget and others have claimed that children's task performance with kinship terms reflects a general logical deficiency: Is there evidence to suggest that these logical errors are manifest in other, parallel contexts?

With respect to (i), Piaget notes that the results obtained are not necessarily associated with any naturally occurring patterns of errors in use. Rather his results involve what he terms "explicit understanding" or the ability to formulate the reason for doing something rather than the ability *per se* to do that something (Piaget, 1928: 83, 114). In fact, he observes without comment that a child confused by the three-brothers test has no difficulties "if one treats the [same] test as a game" (1967: 72) nor does the same child have difficulty listing his brothers and sisters or the brothers and sisters of his friends (ibid., 75). Nor does he explain why a child who fails the "how many brothers have you" test, *passes* the "there are three brothers in the family . . . how many brothers has Alfred? And Raymond? And Auguste?" In other words, when the experimental frame is modified, unexplained differences in performance occur. These results in fact seem to contradict his conclusion that "a relation as simple as that of 'brother' creates insurmountable difficulties for a child of 9 or 10 years" (Piaget, 1928: 82).

With respect to (ii), the issue of task validity, it might be questioned whether these data are really indicative of egocentrism at all. Children 2½ years old, who are significantly younger than Piaget's youngest kinship subjects, correctly use and comprehend the pronouns *you* and *I*. It is not clear why the child would be able to adopt the point of view of another in the case of pronouns at 2½ years of age yet be unable to engage the same perspective in the case of similarly structured kinship terms before 9 years of age. As Macnamara has argued, when children "fail on tests of egocentricity, the likelihood is that some other factor, such as memory load or unfamiliarity with the test concepts, is tripping them up (Macnamara, 1982: 44).

Moreover, it is not clear that in the case of the kinship terms *brother* and *sister* young children are even being significantly "tripped up" relative to adults. The stepwise improvement argument is convincing only to the extent that it is associated with a progressively improved grasp of mature representations. When citing Piaget's protocols earlier, the standard English translation of the French original was used. It might be objected that this translation appears stilted in that "How many brothers have you?" would better be rendered "How many brothers do you have," and so forth for many of the other test questions. In fact, however, the original French questions are peculiar structurally and arguably ambiguous.[1] In spite of the fact that they lend themselves to one interpretation—the one Piaget intended—they plausibly can be misinterpreted by any speaker, regardless of age.[2] This problem is not limited to Piaget's early studies: Macaskill's more recent experimental work also employs questions for which more than one interpretation is possible, and like Piaget's are questions critical for determining the basal levels of comprehension. For example, she asked children "The woman who had you as a baby is your ——" (correct response: "mother") (1981: 289). Inasmuch as *have* is polysemous, particularly with respect to children and babies, subjects could misinterpret the questioner's intent. This might account for the fact that on her protocols, it was not until a mean age of over 5 years that 75% of her subjects correctly completed the tasks for *mother*, *father*, and *grandmother*, in spite of the fact that other studies suggest that *mother* and *father* are mastered at a much younger age, often as early as one year (Lewis, 1981; Thomson & Chapman, 1976; Anglin, 1977; Greenfield, 1973).

Finally, with respect to (iii), other findings suggest that the tasks commonly used may not provide appropriate measures of the knowledge being assessed. Although reporting that Piaget's results were generally confirmed, Price-Williams et al. (1978: 309, 328) and Greenfield and Childs

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[1] *"Combien de frères as-tu? Et de soeurs? . . . Et A combien a-t-il de frères? Et de soeurs? . . . Combien de frères y a-t-il dans ta famille? . . . En tout combien de frères et de soeurs? . . . Es-tu un frère [ou une soeur]? Ernest a trois frères, Paul, Henri et Charles. Combien frères a Paul? . . . Combien de frères y a-t-il dans cette famille?* (1967: 83)

[2] There is anecdotal evidence that lends further support to this argument. At least some French *adults* do find such questions sufficiently confusing that they frequently err in responding to them. Questions of the form "*Combien de frères y a-t-il dans votre famille*" are posed on questionnaires to new inductees into the French armed forces. It seems that recruits quite often respond incorrecly, many interpreting the question "How many brothers are you?" as equivalent to "How many brothers do you have?" While it might be implausible but true that Piaget's Genevan subjects were more mentally adroit than the average recruit in the French armed forces, and without worrying what this might signify for the futures of France and Switzerland, we could reasonably view this as casting some doubt over Piaget's claims. I am indebted to Pascal Boyer for this information.

(1978: 355) also briefly note that children are able to correctly apply and process terms earlier than their performance on either production or comprehension tasks would imply. As observed above, Piaget (1928: 114) acknowledges much the same when he remarks that from comprehension data it appears that the child is capable of using complex kinship terms "in sentences which make sense" before he can define them on production tasks. When the *verbal* aspect of the task is attenuated or removed altogether performance improves significantly. Chambers and Tavuchis' study (1976), which used photographic stimuli to test children's understanding, were unable to replicate Piaget's findings. It should be stressed that the issue here is not production versus comprehension tasks, on which differential levels of performance are not unexpected, but the question of test validity, the extent to which the results derived from these instruments actually assess the child's representations of kinship terms.

Thus, although Piaget's claims represent something of the received view and his results have in part been replicated by a number of researchers, it is apparent that (i) children of less than 2 years of age (half the age of Piaget's youngest subjects) display a decentrated understanding of terms referring to the human world; (ii) the questions Piaget and other researchers posed their subjects are structurally misinterpretable and consistently misinterpreted by at least some adults; (iii) subjects were capable of solving the same problem given certain minor changes in procedure, which suggests that it is the latter not the logical relation that is problematic.

II. KINSHIP AND SEMANTIC DEVELOPMENT

As already noted, Piaget was not substantially concerned with the meaning of kinship terms, the role such words play either in determining the truth conditions or fixing the reference of an utterance. Rather he was interested in how the ability to handle logical relations changed over time. He never explicitly addressed the question of how these logical relations figured in the meaning of kinship terms, only that evidence of their development would be "found in the definitions of the word[s]" (Piaget, 1928: 104).

An alternative interpretation of Piaget's results might involve arguing that the child's performances are not (or are not entirely) the result of a logical deficiency, but follow from the fact that the child actually means something different by the term from the adult. The issue, then, would be lexical rather than conceptual. In essence this is the position that Haviland and Clark and a number of other researchers have adopted in subsequent analyses of kinship terms. Concern for global logical issues such as decentration were replaced by interest in the ascription of general semantic primitives and their evolution.

Clark's theory of semantic development, called the semantic feature

acquisition hypothesis (SFA) states that "when the child first begins to use identifiable words, he does not know their full (adult) meaning: He only has partial entries for them in his lexicon, such that these partial entries correspond in some way to one of the features or components of meaning that would be present in the entries for the same words in the adult's lexicon" (Clark, 1973: 72). Word meanings, on this view, are built up component by component—using a simple combinative calculus—out of semantic features, which, for early features, are perceptually given (Clark, 1973: 104). The child's underlying conceptual "preferences" direct him to supplement the original, and incomplete, semantic mappings with additional features until the adult conditions of application are attained (Clark, 1977: 166).

Ultimately Clark abandoned the SFA hypothesis in favour of an approach she called "lexical contrast theory" according to which words are learned in a manner sensitive to the lexicon as a whole rather than simply in terms of (adult) features. Conditions of application, particularly for words like kinship terms, are seen on the lexical contrast theory as determining the relative complexity of the task, not the features themselves (which she acknowledges were unmotivated and lacking in principled criteria of identification on the SFA hypothesis [Clark, 1983]). Nonetheless, it is important to examine the earlier, SFA hypothesis in some detail, not only because it exercised such influence on the study of developmental semantics in general, but because the componential theory of semantics on which it is based has been and continues to be so central to the analysis of kinship semantics in particular (see Hirschfeld, 1986; Carter, 1984).

The test involved asking 50 subjects from 3 years to 8 years 10 months "What is an X?" for 15 kin terms. Answers were scored on a scalar metric of "correctness" parallel to that used by Piaget (1928: 104), Danziger (1957), etc. Responses were judged to belong to Category One (to use Haviland and Clark's labels) if they were either "blatantly wrong," "irrelevant," or named a person. Category Two responses involved the use of a property feature such as sex or age. Category Three responses were "relational but not yet reciprocal." Category Four responses were "both relational and reciprocal" (Haviland and Clark, 1974: 37–38). Examples of each include (I) "What's a grandson?"/"I don't know, but I guess it's a girl"; (II) "What's a brother?"/"A brother is a boy"; (III) "What's a grandmother?"/"Somebody who's your mother's mother"; (IV) "What's a niece?"/"A niece is like a mother had a sister, and I'd be her niece", so that the child "had become aware that BEING an example of a certain kin relation meant HAVING its reciprocal" (ibid., p. 38).

Now, with the exception of the Category One answers, all the responses are correct in the sense of being sensible. Although not necessary and

sufficient conditional definitions, they are nonetheless meaningful, and often correct, responses to the questions. That the child does not understand that the experimenter wants, or for whatever reason cannot provide, a *definition* (in the above sense), is relatively unenlightening with respect either to the child's cognitive capacities or his semantic representations of the terms involved. The fact that Haviland and Clark's subjects did not provide, say, a Category IV response may be interpreted to suggest that the subject did not fully understand the term in question. But as Haviland and Clark (1974: 46) observed themselves, asking subjects to give definitions of terms is "not an especially good method for assessing exactly how much the child knows about the meaning of each kin term." An acceptable (non-technical) definition of *grandfather*, for instance, makes no mention of the fact that *grandfather* and *grandchild* are reciprocals.

Haviland and Clark characterised semantic development in terms of incompleteness (rather than indeterminacy). There is no reason on their theory for immature lexical entries to be associated with differential performance in comprehension as opposed to production tasks. A term overextended on one task should be overextended on the other, since the overextension is a function of an incompletely bounded lexical entry. Nonetheless, their results vary significantly from those obtained by other researchers. Thomson and Chapman (1976), for example, using five much younger subjects (mean age 22.4 months) found that although all five overextended *daddy* in production, four out of five did *not* do so on a comprehension task (ibid., 370). In contrast, eight of ten of Haviland and Clark's subjects between 3 years 5 months and 5 years 11 months, six of ten between 6 years and 6 years 9 months, and three of ten between 7 years and 8 years 10 months did not attain Category III ("relational but not reciprocal") level definitions. In all, only one of 30 subjects offered a Category IV level definition (1974: 40).

Again, Greenfield and Childs, in an investigation of Mayan children's understanding of sibling terms, used a comprehension protocol in which subjects were asked to provide the proper names of members of their family for whom the investigators provided kinship labels. They report that their youngest age group gave correct responses 47% of the time (1978: 347). In contrast, none of Haviland and Clark's youngest subjects (of roughly the same age) gave Category IV (i.e. correct, adult) definitions for *sister* and only two offered such definitions for *brother*.

Care must therefore be taken when using the results of definition elicitation techniques in determining what the child actually knows, since as Thomson and Chapman point out, results like Haviland and Clark's strongly suggest that "accounts of the child's representation of word meaning and its development cannot safely be based on production data alone" (1976: 371). The relation between production and comprehension is

not independent of task; a theory intending to describe the child's repre-
sentation must describe a representation compatible with both the *best* and
the worst results. Given the nature of Clark's theory, if the child typically
performs well on one task but not another, it is reasonable to take the
latter as evidence for a retrieval error or response bias (see Richards, 1979;
Carey, 1982). Or as Thomson and Chapman (1976: 372–374) argue, such
results may suggest an unstable representation.

III. THE LANGUAGE LEARNER AS NAIVE THEORIST

On one estimate, at any given moment the young child is working out the
meaning of 1600 words (Carey, 1978: 274). Given the scope and complex-
ity of this challenge, the notion that the young child's lexical entries are in
part indeterminate if not unstable seems plausible. At the same time it is
clear from the between-subject consistency evidence in the above-mentioned
and other studies, that the language learner is also capable of applying
some boundary conditions, even for rather vaguely understood terms.
Accordingly, it is plausible to imagine that one of the young child's most
significant semantic skills is the capacity to individuate entries in the
lexicon in virtue of the partial assignment of properties to those entries.
Lexical development consists of a movement away from initial and partial
entries toward complete and accurate ones. What is more controversial is
the character of the initial representations, particularly the nature and
source of those properties first attributed to a given lexical entry, and how
change in these entries occurs.

Common to virtually all models of kinship term acquisition proposed to
date is a characterisation of initial property assignment in terms of induc-
tions the child draws from exposure to a phenomenal context. The initial
state is thus the result of a data-driven inferential process dependent on
perceptually given environmental cues. For Piaget (1928: 131) this is "the
immediate point of view" of the household; for Haviland and Clark it is
"first features . . . based on the child's percepts . . . property features such
as size (or height), sex, voice quality . . ." (Haviland & Clark, 1974: 34; see
also Clark, 1973: 104); for Greenfield and Childs (1978: 355) it is via
"learning through actual examples"; for Price-Williams et al. (1978: 321) it
is "On the basis of perceptual attributes"; for Burling (1970: 18) it is
through 'initially obvious" perceptual features. A second shared presump-
tion of these studies is the notion that the acquisition of kinship terms
reflects processes common to the development of categorical knowledge in
general. In other words, concepts ranging over diverse domains of the
world develop in much the same way, implicating processes with global
cognitive scope.

Recently a number of researchers have argued that together these assumptions tend to obscure a particularly pertinent aspect of the developmental process: Namely, that the young child's early lexical representations often seem to be at once more narrowly constrained and less phenomenally derived than the traditional view would allow. This observation has prompted a greater interest in the initial and partial projection of properties onto early lexical entries and the strategies that the young child employs in making these projections (Keil, 1988, 1986, 1979; Carey, 1985, 1978; Gelman, 1988; Gelman & Markman, 1987, 1986). In contrast to earlier work, which emphasised how children group objects into categories, many of these studies have focused on the naive theories embedded in the conceptual networks; that is, to the way children use categorical structure to draw otherwise unexpected inferences about the members of category (Gelman & Markman, 1987; Hirschfeld, 1989).

The rich categorical knowledge these studies have described permits the child to assign an incomplete entry to a more or less discrete class of terms (thus in part individuating a lexical entry and translating relatively vague contextual cues into likely lexical properties). Clearly such knowledge also greatly enhances the child's ability to process a large number of terms simultaneously. A number of steps are involved in this process, implicating a variety of conceptual strategies. Carey (1978, 1985) has described the embryonic stage of lexical acquisition, during which such assignment occurs, as "fast-mapping": "What is included in that initial mapping—that the new word is a word, along with some of its syntactic and semantic properties—must allow the child to hold onto that fragile new entry in his lexicon and keep it separate from hundreds of other fragile new entries, and it must guide his further hypotheses about the word's meaning" (1978: 275). In producing this initial representation, which as noted above often entails deriving relatively accurate semantic information from ambiguous contextual cues, a number of constraints guide the young child's early representations. Lexical (Clark, 1985), syntactic (Katz, Baker & Macnamara, 1974; Macnamara, 1982: 17–31), and ontological (Keil, 1979) constraints have been proposed that would significantly limit the sorts of initial definitions a young child will tender. How these boundary conditions emerge is not always clear, and it is possible to interpret at least some of them as being the result of inductions from prior knowledge or responses to contextual conditions. In other domains of categorical knowledge it is less evident how prior knowledge or contextual information could account for the constraints on early representations. This is particularly evident in what Gelman (1988) calls theory-based knowledge, categorical understanding in which the child engages complex conceptual structures that allow inferences about and capture similarities between unfamiliar objects and unforeseen instances.

For example, Keil (1986) told subjects that a particular animal species had been modified in outward appearance so that it now resembled a different animal species (by, for example, painting one kind of animal to look like another kind of animal). Even preschoolers, however, did not take this alteration in appearance to be a change in the stimulus animal's category membership. On the other hand, the same subjects did accept that when man-made objects, artifacts, were similarly altered, category membership did change. The fact that an object is attributed living kind rather than artifact status significantly limits what can and cannot be true of it in a way that appears to be partially independent of individual experience. In other words, something about attribution of living kind status—of having fast-mapped the lexically tagged object as animate—significantly constrains what the child will sensibly infer about the object and hence the meaning of the lexical item associated with it (Keil, 1979).

Striking results were also obtained by Gelman and Markman (1986, 1987; Gelman, 1988) in a series of studies concerned with young children's inductions over natural kinds. They were able to assess the importance of physical similarity relative to category membership (while controlling for prior knowledge) in 3- and 4-year-old children's projection of properties from one living kind or artifact stimulus to another. In one study subjects were shown a picture of three natural kinds (for example a tropical fish, a shark and a dolphin) and were asked to determine whether a property true of one stimulus was true of the others (for example, whether the shark breathed more like the tropical fish than the dolphin). In spite of the fact that the shark, labelled "fish", was perceptually more similar to the dolphin than the tropical fish, Gelman and Markman (1987: 1533) found that preschool children generally "use natural kind categories to support inductive inferences even when category membership conflicts with appearances."

In a similar study Carey (1985) taught 4- and 6-year-olds that certain living kinds (alternatively people, dogs, and bees) have internal organs called *omenta* (spleens). They were then asked whether other animals, plants and inanimate objects (including a mechanical monkey) had omenta. All subjects, including preschool children, denied that inanimate objects or plants could have omenta, a finding consistent with Keil's (1979) and Gelman, Spelke and Meck's (1983) conclusion that generally children do not attribute animal properties to inanimate objects. As with the Gelman and Markman studies, it is apparent that when taught that a dog has an omentum, children are not inferring that people do and mechanical monkeys do not have omenta primarily on the basis of the perceived physical similarity—mechanical monkeys resemble people more than bees do, yet children do not project omenta onto the former but do onto the latter.

Taken together, these studies strongly suggest that neither linguistic context, prior knowledge, nor perceptual similarities are sufficient to explain the rich constraints that range over the preschoolers' knowledge of living kinds. The traditional view, that the child builds up knowledge of the world through inductions from experience, thus seems inadequate in capturing the scope of the child's early conceptual representations of living kinds and the sorts of hypotheses he will subsequently entertain about them. Rather it appears that even young children are applying what might be called a rudimentary theory of biology that posits certain regularities in intrinsic structure between organisms, even for those categories whose lexical entries are extremely fragmentary.

IV. DEVELOPMENT AND DOMAIN SPECIFICITY

In the case just described the naive theory reflects the fact that living kinds seem to form a distinct domain of knowledge (Atran, 1987), one whose conditions of development appear to be significantly unique (Keil, 1988; Atran & Sperber, 1987 (Note 1)). While formal conditions for domain specificity have not been described, several intuitive tests are available when attempting to determine whether or not a pattern of related meaning reflects an instance of domain specificity.

First, is the pattern universal? The exhaustive and transitively structured taxonomies of living kinds appear to vary remarkably little across cultures and historical epochs (Berlin, Breedlove, & Raven, 1973; Atran, 1986).

Second, is the regularity a function of a lack of variation in learning environments? The mnemonic salience of the same focal colours in spite of significant variation in both colour nomenclature and chromatic environment strongly suggest that colours form a unique conceptual domain whose consistency is independent of the supporting environment (Berlin & Kay, 1969; Rosch, 1975, [Heider], 1972; Miller & Johnson-Laird, 1976).[3]

Third, does reference to a member of a given domain spontaneously invoke the domain as context? To put it another way: what does the domain contribute to the apprehension process? Quine (1960), for example, has argued that humans must logically proceed *in general*, both in the

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[3]While the human colour visual system is neurophysiologically constrained in a way which privileges the perception of focal colours (Bornstein, 1975), the relationship between conceptual predispositions—as with the case of the *mnemonic* saliency of certain colours—and perceptual biases is nonetheless complex. For example, the conceptual salience of the phonemic processing of linguistically relevant input is related to phonetic feature discriminators, but underdetermined by them (Aslin, Pisoni & Jusczyk, 1983). Conversely, the mnemonic salience of the human face relative to other parts of the body does not appear to be linked to a *perceptual* device uniquely targeting human faces (Davies, Ellis & Shepard, 1981).

aquisition of knowledge in childhood and during radical translation, from a priori limits on natural inference. The illustration he uses is the following: When the speaker of an unfamiliar language indicates a moving, white rabbit and says "*gavagai*" we can reasonably conclude that *gavagai* is the word for rabbit, not for animal, running, rabbit leg, or the colour white (see Markman & Hutchinson, 1984 for experimental support that this conjecture holds even for young children). The limitation on inference is intuitively plausible in this case because it involves an aspect of the object referred to which is so natural that we need not specify our intention to refer to it. It is what Atran (1987: 50) has called an expected ostension, "the act of making apparent (one's intention to make apparent) what every human being would naturally expect to be manifest to anybody."

We might ask, however, whether the intuitive plausibility of such expected ostensions when the target is an animal follows from a general constraint on inference as Markman and Wachtel (1988: 12) argue, or one specifically linked to living kinds. When one ostensively defines for a young child an animal by, say, pointing to a buffalo while uttering "That [thing over there] is a buffalo," the child almost certainly understands that the indicated object is a sort of living kind with a presumed, but unknown underlying nature (Atran, 1986, 1987; Keil, 1988). The child will subsequently be able to recognise other instances of it under vastly varying conditions and process phenomenally peculiar types of living kinds in essentially the same manner (the young child will recognise that aardvarks and wombats are animals when introduced to them only through photographs and without additional commentary [Anglin, 1977: 258]). The young child apparently will also accept with little difficulty that many species undergo radical morphological changes in ontogenesis (tadpole to frog) (Atran, 1987). Yet in contrast to proposals like Quine's, in which the child is simply (and implausibly) recognising patterns of perceived phenomenological similarity, Gelman and Markman's, and Keil's, studies suggest that these sorts of expectations and dispositions to believe are neither the result of a perceptually derived constraint on inductive inference nor a general processing constraint, but entail the child's domain specific theories of what are and what are not salient elements of the world as well as critical aspects of the relationship between these elements.

V. AN ALTERNATIVE APPROACH TO KINSHIP

The study of these naive theories and the processes underlying them strongly suggests that our understanding would profit from a concern with what the child never does wrong as well as what he cannot do right (see Keil, 1981). To return to the case at hand, are there any regularities in young children's representations of kinship terms that prevent them from

making certain kinds of errors? Are there things that children are extre-
mely unlikely to deny about kinsmen that cannot be inferred from the
social context? In other words, what if anything is there to suggest that the
acquisition of kinship terms is constrained by a universal, domain-specific
naive theory involving expected ostensions?

With respect to the conditions for domain specificity reviewed above, it
appears that the first condition, universality, is *prima facie* met: Few
scholars concerned with the topic would challenge the view that kinship
term systems are found in all known human societies and in all known
historical epochs. Similarly uncontroversial, in sociocultural anthropology
at least, is the claim that the universality of such classes of individuals
reflects the specific and invariant kind of relationship that ranges over
those individuals classified as being kinsmen.

The dominant view in formal semantics in anthropology as well as in
psychology and philosophy assumes that this relationship is a function of a
limited number of genealogical predicates, including but not limited to
CHILD OF and PARENT OF. It is further presumed that kinship forms a
single semantic field precisely because the terms figuring in that field can be
adequately characterised in terms of these genealogical predicates. (For a
detailed discussion of these assumptions, see Hirschfeld, 1986.) To the
extent that terms can be defined in terms of a relatively small set of
predicates that exhaustively captures them, investigations into how these
predicates are acquired or processed is reasonably straightforward. As we
observed earlier, it is this putative feature of kinship terms that has
attracted most psychologists.

Given the nature of the genealogical predicates, that understanding
them entails having a certain sophistication about biological processes, has
meant that the young child's early representations assume a disjunctive
character *vis-à-vis* mature representations: "until the child has learned
something of the biological context of parenting, he cannot have the
concept of *brother* according to which adults and animals have brothers"
(Carey, 1982: 96). If this were indeed the case, it would help explain why
Piaget, and most other researchers, have concluded that "a simple rela-
tionship like that of brother still presented insurmountable difficulties to
the child of 9–10" (1928: 96). Immature representations of the terms would
presumably be limited to simpler (less theory-laden), perceptually given,
and broad-scoped predicates like gender (Haviland & Clark, 1974: 34–35).

In treatments as diverse as Piaget's (1928: 104) and Carey's (1982: 373)
the kinship-learning preschooler is seen to start out from an essentially
atheoretical perspective on which kinship terms are simply mapped onto
some other already mastered lexical entry. In the case of *brother* and *sister*
the young child's equation of *brother* with *boy* and *sister* with *girl* simply
reflects what Carey (ibid.) calls the "dominant use of the word," which

captures the fact that boys in a common household tend to be brothers. Being a boy, accordingly, would not be an attribute of being a brother; rather the two terms would be synonymous.

There are at least two problems with this argument: First, if *brother* and *boy* are lexical equivalents, how are we to account for the child's poor performance on the very tasks from which this conclusion is derived, those tasks meant to assess the young child's understanding of kinship terms? It may be recalled, for example, that Piaget asked his subjects (i) how many brothers there were in his family, (ii) how many brothers there were in Ernest's hypothetical family, and (iii) whether or not the subject was a brother? Seventy-five per cent of his subjects did not respond correctly to these questions until the ages of 6, 9 and 10 years respectively (1928: 100). If we accept the view that *brother* and *boy* are synonyms then we are forced to accept the curious and implausible conclusion that 5-, 8- and 9-year-olds are incapable of counting the number of juvenile males in either their own or a hypothetical household. Nor would they be capable of identifying themselves as boys.

A more plausible interpretation might take the following tack: *brother* entails BOY (or something like MALE OF SAME RELATIVE GENER-ATION AS SPEAKER or alternately JUVENILE MALE). When responding "a boy" to the question "what is a brother", subjects are not offering necessary and sufficient conditional definitions. Rather their response is analogous to saying "an animal" to the question "what is a dog?" They answer by providing a non-uniquely determining entailment. As we have already observed, such answers are perhaps the most common first-level responses to the kinship definition tasks: they are neither incorrect nor are they unreasonable responses to definition elicitation tasks involving terms that are incompletely represented in the child's lexicon.

The proposed solution also accommodates those things that the child does *not* do during the acquisition of kinship terms: While the child apparently does not lexically identify *boy* with *brother*, evidence reviewed below demonstrates that he does consistently mark the latter with the appropriate gender and relative generation. It might be argued that the child does this by mapping an evident perceptual cue onto a linguistic regularity. Yet if this is so, it is not clear why young Zinacanteco children do not follow adult usage by marking Zinacanteco sibling terms with sex of speaker, a feature that is *prima facie* neither more complex logically nor more perceptually opaque than sex of referent, a feature they and other young children world-wide correctly map onto sibling terms (Greenfield & Childs, 1978).

Our suggestion is also consistent with an additional aspect of the data that is seldom explicitly addressed but extremely interesting: No one has doubted that even young children individuate and represent kinship terms

in their lexicons to the extent that they (i) spontaneously and correctly produce meaningful utterances in which kinship terms figure, and (ii) appear to comprehend utterances in everyday speech in which a significant number of kinship terms figure. When LeVine and Price-Williams (1974), for example, asked Hausa children to list the coresident members of their household compounds and then identify each member in response to questions in the form, "Who is ——?", they found that even though they did so less frequently than older children, the youngest subjects (4–5 years) readily identified their coresident members with kinship terms. Like Greenfield and Childs (1978: 354), LeVine and Price-Williams found that most errors involved omission rather than commission; the issue was more whether the young children were familiar with a given term, less whether they incorrectly used it.

Price-Williams et al. (1978: 309) concluded that while their data confirm Piaget's findings, all their subjects were able to "apply the term before they would attempt to define it categorically. . . . In short, children use terms correctly before they can even begin to define them" (p. 328). As remarked above, Piaget (1928: 114) made much the same observation, in spite of the fact that such findings seem strikingly inconsistent with the claim that children do not master terms such as *brother* and *sister* before 9 years of age. Clearly much younger children have complex representations of kinship terms in their lexicons; whether or not they can provide necessary and sufficient conditional definitions for them is another matter, having little bearing, for the adult no less than for the child, on the question of those representations' content. What *can* we infer from the existing data about the way kinship terms are represented in the lexicon? To phrase the question in terms accordant with our earlier discussion of living kinds: What boundary conditions apply to the early representations of kinship terms and how are they initially individuated in the lexicon?

Early constraints on kinship terms

Gender. As already noted, there is ample evidence that the terms are correctly marked for gender at even the earliest stages. Haviland and Clark (1974: 43) found no evidence for an age-dependent difference in definitional acuity with respect to gender. Greenfield's infant daughter extended *dada* to females only up until the point when she was introduced to the term *mama* (*dada* till then being taken to mean "caretaker," according to Greenfield [1973: 38–40]). Other researchers have obtained essentially the same results with slightly older toddlers: Lewis (1981: 409) reports that the term *daddy* (or some equivalent) appears at about 15 months but is generally overextended only to adult males. Katz (1983: 49) found that the

concepts MOMMY and DADDY, "although rudimentary . . . are already accurate by about 18 months."

Relative generation.   Lewis went on to describe another salient feature of toddler linguistic production: "By 18 months, [*daddy*] was overgeneralised to include other faces. The nature of the errors is instructive because 90% of the errors were applied to *adult male* faces" (ibid.). In other words, it also appears that very young children recognise a predicate something like RELATIVE GENERATION and project it onto kinship terms. For slightly older children, the effect is more comprehensive: Danziger found that children often denied that an adult could be a brother. When asked why, they typically responded either that the adults were not children (of the correct relative generation) or that in virtue of being married they could not be brothers (1957: 223; see also Chambers & Tavuchis, 1976: 71; Piaget, 1928: 106; Price-Williams et al., 1978: 303).

Keil and Batterman (1984) provide experimental evidence demonstrating that generation is initially a particularly pertinent feature of kinship terms. They presented young subjects with the following two stories: "This man your daddy's age loves you and your parents and loves to visit and bring presents, but he's not related to your parents at all . . . Could that be an uncle?" and "Suppose your mommy has all sorts of brothers, some very old and some very, very young. One of your mommy's brothers is so young he's only 2 years old. Could that be an uncle?" (ibid., p. 227). They found that kindergarteners invariably assented to the first and dissented from the second stories. It is not until 4th grade that children consistently provide "adult" answers (and rationales) to the stories. Whitehead's (1961: 7, 13 (Note 1)) finding that for many children siblingship is not part of the definition of *aunt* and *uncle* and that children frequently include "courtesy" aunts and uncles among lists of their relatives, supports Keil and Batterman's claims (see also, Burling, 1970: 17–18).

The notion of the family.   A third constraint on kinship terms involves the cognitive significance of the family concept. In many respects it is the most important *kinship* constraint because it provides the basis for discriminating a specific lexical domain of kinship terms. Unlike gender and relative generation, which individuate kinship terms relative to each other, the notion of family sets off kinship terms from the rest of the child's lexicon and thereby provides an alternative to the genealogically derived predicates which are too adult-theory-laden to serve that purpose for the young child.

A number of researchers have observed that the notion of family seems to play an important role in young children's definitions of kin terms. Price-Williams et al. (1978: 330) noted that the family serves as a reliable frame

which children turn to when they do not know enough, or have not had sufficient experience, to map more extensively less familiar kin terms. Macaskill (1981: 284) considered it to be sufficiently self-evident to young children that she successfully used it as a priming example in her study of kinship terms.

Other research has shown that the notion of family is inherently relevant, that it has wider conceptual importance. For example, Markman (1973) tested the influence of collection versus class terms in conservation and class inclusion problems. In her initial study *family* was used as the collection term stimulus. Interestingly, in a subsequent set of studies, using *family* as well as *army* (versus soldiers), *hockey team* (versus hockey players), etc., Fuson et al. (1988) were unable to replicate Markman's findings—that collection terms facilitate conservation judgments—*except* in those studies in which *family* was the stimulus collection term used. *Family* seems to provide a spontaneously more salient collection concept than do other frequently occurring collection terms, and is associated with more efficacious processing of inferential tasks, which are presumably unrelated to kinship *per se*.

Piaget (1928) analysed another pertinent aspect of the family concept: it is closely associated with the notion of CORESIDENCE. Other researchers have found the association of kinship and coresidence to be especially relevant in younger children's definition of kinship terms generally. Price-Williams et al. (1978: 331) note that "persons who lived in the same household unit are labelled "brothers" and "sisters," while persons of two different household units are typically "cousins." Greenfield and Childs observed that children "infrequently name people outside their sibling group in answer to sibling questions" (1978: 355).

These associations could presumably be interpreted as the product of a data-driven inferential process—kinsmen being people who live together and to whom kinship terms apply—and would be consistent with the view, cited above, that early representations are perceptually based. Such an interpretation would mean that the child construes *family* as a synonym for *coresident*, in a manner analogous to the *boy* and *brother* example discussed above. At least two factors suggest that the matter is more complex. First, as Price-Williams et al. note in the quotation mentioned earlier, persons of different households are not necessarily thought to be of different families, but are thought to be referred to by different kin terms from those members of the family who are coresident with ego. Second, grandparent terms are among the earliest kinship terms acquired, yet grandparents are typically not coresident in the Euro-American households where many of the data were derived (Macaskill, 1981). It appears then that even young children realise that different households instantiate

the same family, rather than equating family with the immediate coresident household (see also, Piaget, 1928: 116).

These data suggest that while coresidence may be phenomenally fixed, family is not. Piaget himself argues that the notion of family is the result neither of "direct or spontaneous experience" nor "observations of the external world" but of the child's interpretation of the adult (verbal) concept. While the juvenile notion of family is image-like, in the sense of phenomenally bounded, "it is not the image that has given rise to [the child's representation] but conversely" (ibid., p. 114). Price-Williams et al. also report that the notion of family figured most prominently, not in the representation of coresident kinsmen, but in the analysis of "semantic components in the [youngest children's] errors for naming other-centered kin" (1978: 330).[4] By arguing that coresidence does not phenomenally fix the extension of *family* we are not denying that it plays an important role in the way it is apprehended. In fact, coresidence is important precisely because it signals a perceptible regularity on which children can map the terminological system of kinship, a system which is generally thought to be opaque to such phenomenal patterning (Miller & Johnson-Laird, 1976: 360).

Still, it is not self-evident that the child should link coresidence with family at all. Most object- as well as person-categorisation in fact involves a spontaneous distinction between the thing categorised and the local conditions under which it is learned; categorical knowledge generally involves context-independent equivalence classes. Consider another phenomenal array which the child could conceivably associate with his immediate surroundings: The child's initial exposure to furniture is that of the furnishings in his own home, yet it is implausible that the predicate CORESIDENT, to speak loosely, *ever* figures in the child's definition of *furniture*. In the case of the notion of family, however, the generalising aspect of categorisation is in part modified and the nature of the child's conception appears to be underdetermined by how the child typically experiences object- and person-phenomenon.

Another assessment of such underdetermination is uniformity in knowledge unpredicted from wide variation in learning contexts or supporting environments. There are a number of findings which suggest that such uniformity is characteristic of the acquisition of kinship terms. Several researchers have reported that differential levels of experience, either with a specific kinship term or with the kin-type named by a specific term, do not

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[4]Price-Williams et al. (1978: 297) contrast ego-centred terms ("used by the child for his kin" with other-centred terms ("used between other pairs of the child's kin").

produce differential levels of performance on tasks in which those particular terms figure:

> It is a remarkable thing that there is no noticeable difference between only children and others [in their performance on tasks using *brother* and *sister*]. (Piaget, 1928: 107.)

> The prediction that experience with kin would affect the level of definition given for the kin term was therefore not supported by the present data. (Haviland & Clark, 1974: 43.)

> What is the role of individual experience in shaping the acquisition of kin-term definitions? Apparently very little with regard to which kin terms will be defined first. . . . Our data also indicated no apparent difference in performance between children who live in nuclear families and those who live in nonnuclear families. . . . (Price-Williams et al., 1978: 331–332.)

> We also explored the roles of age, sex and family composition with regard to level of knowledge and ability. The latter proved to be the least illuminating. . . . We also found that many children responded knowledgeably to questions concerning relationships which were not reflected in the composition of their own families. (Chambers and Tavuchis, 1976: 77.)

Another assessment of the influence of differing supporting environments is provided by cross-cultural studies. Here again we find evidence in support of domain specificity. On the basis of their study of Zinacanteco kin-term acquisition, Greenfield and Childs (1978: 353–356) concluded: Basically the structure of the terminological system had no effect on the level of performance in our task. . . . It is interesting and somewhat surprising that our results manifest clearly the influence of supposedly universal processes, like decentration and memory development, but do not show any effect of the distinctive features of the Zinacanteco environments. . . .[5]

What is perhaps most surprising about these results is the lack of discussion they seem to have provoked. Virtually all the studies reviewed

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[5]Their data also lend support to our claim (and in contrast to both the Piagetian and SFA positions) that relative generation and gender are privileged by the young child regardless of whether or not other dimensions are equally pertinent in a given system (Greenfield & Childs, 1978: 355).

Greenfield and Child also assessed the extent to which specific features (semantic dimensions) were violated in errors of commission (which accounted for 11% of all experimental errors). Most errors involved two dimensions, (i) misidentification of the correct reciprocal and (ii) misidentification of relative age (within a generation), the first being approximately twice as frequent as the second. In contrast, Zinacanteco subjects displayed very few errors involving the features of common parentage (which is more or less coextensive with coresidence) and sex.

here construe at least the initial properties of kinship terms as derived from an empirically driven and perceptually contingent process. Yet this emphasis on an inductive process, which argues that as a result of exposure to some external regularity the child assigns certain properties to the term, is clearly paradoxical, given the lack of association between environmental conditions and the acquisition process.

These findings are no less curious even if it is argued that the invariant pattern of development is a function of invariance in the nature of all kinship systems. This proposal might account for the lack of variation found in cross-cultural studies, but would do little to explain why different levels of individual experience with any given system produce such little effect on the developmental pattern. That is, even if the system that the child acquires does not vary that much across cultures—which in fact does not appear to be the case empirically—and thus it is not invariance in the child's conceptual endowment that accounts for the absence of a local effect, it is not clear why intracultural differences in experience would be found to count for so little.

In this light, consider the semantic primitives approach on which the child supposedly adds increasingly complex predicates to a given lexical entry, eventually arriving at the proper adult combination of features (Clark, 1973: 72). Inasmuch as these predicates are not assumed to be *a priori*, the child is seen as inferring them through exposure to a certain sociocultural environment. Such environments clearly differ, both in terms of individual differences (say, being an only child) and in terms of the variations in experiences associated with differing systems of shared belief (say, growing up in a Zinacanteco household). To the extent that this local variation is not empirically reflected in differing patterns of acquisition, it is implausible to argue that the acquisition process is primarily an inductive learning process. Another, and stronger, hypothesis might argue that the adult (genealogical) predicates are given *a priori*. Such a claim seems ill-supported by the significant age-dependent differences in performance on tasks presumably sensitive to the acquisition of these predicates. Finally, Piaget's view that these changes reflect differential ability in the logical processing of the predicates engenders an additional paradox in that it introduces an incapacity to master a logical operator in a domain essentially equivalent to a domain in which the child has already evinced mastery of the logical operation.[6]

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[6]The issue here differs fundamentally from the apparently similar case of conservation, for which Piaget reported analogous differences in the sequence of the acquisition of logical skills associated with different tasks. In that case, Piaget (1952, 1960) appealed to the notion of *horizontal décalage* to account of age-dependent differences in performances on conservation tasks requiring similar operations. He claimed that the various tasks—involving the conserva-

VI. DISCUSSION

Several conclusions can be drawn which, though necessarily tentative, are also rich enough to yield testable predictions and suggest the kinds of data needed to confirm or reject the claims made. First, the child possesses from the outset some hypotheses about the nature of (at least some aspects of) the social world. As Greenfield and Childs (1978: 357) remark: "Perhaps the lack of influence of culture-specific factors relates in some way to the universal importance of kinship as the basis for all human societies." Second, the child's early semantic representations appear not to be by nature wrong, simply less determinant than their adult counterparts (hence the differential levels of performance on *some* production and comprehension tasks).

The child's and the adult's representations are clearly not coextensive, but they are nonetheless invariably closer than would be predicted on the accounts reviewed above. It is evident that kinship terms bear a special developmental relevance and are among the very earliest, often *the* first, words acquired (Anglin, 1977: 34). Given exposure to minimal linguistic cues (as with Greenfield's daughter's acquisition of *dada* and *mama*), the young child very quickly grasps the notions of relative generation and sex (Anglin, 1977). Another way of putting this is to observe that the very young child has a spontaneous disposition to characterise humans in terms of invariantly salient aspects. This much is hardly controversial: presumably few of the authors whose work has been reviewed would deny that the young child is capable of distinguishing male from female or adult from child.

These capacities, coupled with some general disposition to group together phenomenally similar things and invest them with epistemic saliency, might suffice to account for the very earliest representations of *mama* and *papa*, in that at this point they seem to be more or less general category words, meaning something like adult male and adult female. But these capacities will not capture what the young child seems to recognise intuitively about his social world, particularly the universe of kinsmen, once the terms become kinship terms proper, and are identified with the family and with the household. Accordingly, our first empirical prediction

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tion of number, mass and volume—were mastered at different ages because the tasks differed in the degrees of abstraction they required. Without worrying here whether this explanation is adequate in accounting for the variations in the results of conservation tasks (where the differences between number, mass, and volume could arguably be interpreted as modal differences), the notion of décalage does not seem to be very useful in explaining the apparent differences between the levels of egocentricity encountered in kinship and pronominal terms. The two instances would seem to entail precisely the same sort of (social) decentration and be of the same level of abstraction.

is that once this occurs, the frequently reported (Anglin, 1977) overexten-
sions of these terms would disappear and the terms would be generalisable,
in the sense that other children are assumed to have mothers and fathers as
well.

We thus contend that the child must be spontaneously disposed not only
to believe certain things about humans as individuals (i.e. that they are
male or female, adult or child), but certain things about humans in groups.
Specifically, we argue that young children conceptualise humans as living
in and interrelated within certain kinds of highly salient collections, reason-
ably called families. We propose that the young child's notion of family is
an attempt to capture a sense of relatedness (or resemblance) reflected in
certain aspects of coresidence. Furthermore, we propose that the child is
disposed not only to see that humans are associated within the context of a
family, but that the family is internally differentiated in terms of rôles or
positions predicted on gender and relative age. We hypothesise that the
names for these positions are kinship terms.

By maintaining an epistemic connection between (i) how a family is
physically and interpersonally installed, coordinated, and localised, and
(ii) what it means to be a member of a family, the young child has gone a
long way toward representing some of the salient facets of social life.
Additionally, by conceptualising the family as internally differentiated,
rather than simply the household, the young child would be capable of
associating phenomenally evident kinsmen, those with whom he coresides,
with those which are not—grandparents, uncles and cousins—something
which, as we saw earlier, young children have been empirically found to
do. (See note, p. 568.)

We propose that what follows in the evolution of kin term is a process
whereby new kinship terms are added to the lexicon as largely undecom-
posed primitives. Thus, and in contrast to the SFA hypothesis, we argue
that these early representations do not consist of bundles of features, but
are category names for additional positions within a family. The fact of
being a family member would entail attribution to the domain of kinship.
While these added terms would also be marked with properties like SEX,
RELATIVE GENERATION, such markings would not represent seman-
tic primitives defining the terms, but likely associations which guide the
child's hypotheses concerning the nature of the relation linking the posi-
tions which the various terms name.

To take the term *brother*, considered earlier, it would be surprising, for
instance, if *brother* could ever be shown to be truly synonymous with *boy*,
inasmuch as there may never be a semantic state in which the term *brother*
is not attributed to the domain of kinship, marked as a FAMILY MEM-
BER. Hence, according to our hypothesis the early mappings of the word
would capture (i) that the word is a kinship term, (ii) that it applies to a

member of (and position within) a family, and (iii) that the individual to
whom it refers is a male and of the same relative generation as self.
Habitual or dispositional properties of brothers might also be assigned on
such early mappings (that they are tall or mean-spirited, for example), in a
way analogous to what Haviland and Clark (1974: 34) predicted and Keil
and Batterman (1984) found.

Eventually the child begins to tender other hypotheses about what things
are characteristic of the usage of this kin term; thus *brother* and *sister*
would not be reciprocal in virtue of common definitional elements (i.e.
reciprocal because they share a constituent feature which renders them
thus), but would be reciprocal when the attribute "has a reciprocal" is
mapped onto the term (i.e. marked by the property of being
RECIPROCAL).[7] *Grandfather* and *grandson*, for instance, would be
defined in terms of their (generational) positions within the family struc-
ture rather than in terms of a recursive combination of features (the father
or one's parent/the son of one's child). This interpretation would account
for the unwillingness of younger children to attribute child"ship" or
siblingship to parents (Danziger, 1957; Price-Williams et al., 1978). Terms
like *parent* and *grandparent* would not be relationally defined categories,
but superordinates for certain classes of individuals defined in terms of the
position they occupy within the family. A parent or a child is a member of a
subclass of the family, part of the latter's hierarchical structure; they are
neither relations for recursively or reciprocally defining the member terms,
nor are they biological inferences.

Treating the notion of reciprocity in this manner allows us to capture
another frequently encountered empirical paradox: Children are often able
to identify who are and who are not brothers, while performing poorly on
tasks assessing their appreciation of the reciprocal nature of sibling terms
(Piaget, 1928: 104; Greenfield and Childs, 1978: 351). We argue that the
child is able to use and comprehend a number of kinship terms appropri-
ately, including *brother* and *sister*, in a manner instantiating the necessary
reciprocal (same generation) and transitive (across generation) relation-
ships between the terms, even though he has not yet mastered the notion of
siblingship that the genealogical concept implies. The "same generation"
relationship of siblingship genealogically entails the "cross-generational"
one: To be a sibling means having common parents. While for the adult,
the reciprocal nature of sibling terms might be construed as a consequence
of the parallel biological link to common parents, it is plausible that the
young child, who does not possess the genealogical–biological knowledge

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[7]This is consistent with Greenfield and Childs' (1978: 351) finding that: ". . . children seem
to be learning reciprocal pairs of relations by treating each member of a question pair as an
independent one-way relation rather than as part of a reciprocal pair."

on which this rationale is based, would encounter difficulties in grasping this fact. Consistent with this interpretation is the finding that the acquisition of certain features, including reciprocity, displays less between-subject consistency than features like gender and relative age (Danziger, 1957).

All of this is consistent with the claim that kinship terms represent a domain-specific conceptual array with innately guided unique conditions of acquisition and an enriched initial state. What is universal about kinship terms is not necessarily the fixed character of their overall development, but the predisposition to conceptualise both kin terms and kinsmen in terms of theory-based categorical knowledge. Moreover, changes in such knowledge do not necessarily represent movement toward a comprehensive and empirically fixed adult model, but articulate an increasingly more sophisticated folk-theory of society. Again, to the extent that variation in exposure to different systems of kinship and differing levels of experience with different kin terms and kin types seem to exert limited influence on the way this categorical knowledge develops suggests that such changes represent a good deal more than a simple recapitulation of the child's experience with human collectivities.

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Note: The young child's task of spontaneously distinguishing a set of abstractly defined family members, as opposed to a class of perceptually-defined co-resident individuals, is facilitated by two linguistic constraints. The first is a semantic constraint which marks off a limited set of social relationship terms (kinship terms as well as nominals for neighbours and friends) such that being an uncle, for example, entails being someone's uncle, just as being a neighbour entails being someone's neighbour, or being a friend entails being someone's friend (in a manner different from being a baker, which does not entail a necessary relationship) (Hirschfeld, 1986: 224). This condition, however, does linguistically discriminate relations which are abiding from those which are not. Thus the importance of a second constraint described by Pica (1988) (reflecting what he [ibid., p. 218] calls the "metaphysics of language") such that nominals characterising *inalienable* aspects or properties of the referent are syntactically distinguished from those which are alienable. The intersection of the nominals over which these two constraints range is kinship terms, and the combined operation of these constraints could provide the young child with the linguistic conditions for marking off the domain of kinship.