IN THE NAME OF ALLAH

THE ACQUISITION OF SEMANTIC FEATURES BY CHILDREN IN LEARNING THEIR FIRST LANGUAGE

PART ONE

BY DR MAHMOUD FARROKHPEY
AZ-ZAHRA UNIVERSITY
TEHRAN, IRAN

چکیده:

در مقاله حاضر فراگیری عوامل معنائی توسط کودکان در یادگیری زبان اول مورد تحقیق قرار گرفته است. در این بررسی بحث شده است که تمامی روشها و اسلوبهائی که به تجزیه و تحلیل زبانهای طبیعی از نظر معنا می‌پردازند پیوسته براین اصل استوار بوده‌اند که معانی واژگان، مجموعه‌هایی غیرقابل تجزیه نیستند بلکه تصور این است که معنای یک واژه مجموعه‌ایست قابل تجزیه به اجزای تشکیل دهنده آن. فرضیاتی چند در باره نوع و کیفیت عناصر ابتدائی معنایی که ساختار زیربنایی واژگان را در زبان بشری تشکیل می‌دهند وجود دارد.

مقاله حاضر، که در دو قسمت در شماره‌های سوم و چهارم این مجله از نظر شما می‌گذرد، این فرضیات را مورد نقد و بررسی قرار داده است.

INTRODUCTION

The acquisition of language by children has long been of central concern of contemporary psychology. This interest is surprising, because everyone recognizes the enormous complexity of language use and laguage development in the child. In spite of a widespread recognition, that there is little hope of having a complete theory of these matters at any time in the near future, a general air of activity prevails about the progress being made. For example, recent attention has been focused on the acquisition of grammar by young children and a number of studies have been done of the early

grammatical development of English speaking children. A few studies have also been done in other languages, mostly Indo-European languages (see Bates et al 1973; Slobin 1966, for instance).

One of the goals of most of these studies has been to shed some light on what might be universal processes of language acquisiton. That is, research has been directed toward the study of not only how a particular chil acquires English, but how children acquive language.

It is now possible to cite a fairly large number of references in the literature on almost any aspect of language developement in the child, ranging from phonology to samantic comprehension, with probably the largest number of studies being on the syntactical developement of children's language. It is surely in this area that the most progress has been made over the past decade and a half. But I do feel that too great an emphasis has been placed on grammar or syntax, and too little on semanoics. I want to try to help redress the balance by making the case for a somewhat intensive research in the literature for what has been done on one aspect of the semantics of children's language.

This paper is about the acquisition of semantic factors by children in the process of language learning. I am aware, however, that an adequate account of language acquisition by children must deal with more than semantic factors. Since, as Melisa Bowerman says many aspects of language structure are purely formal, in the sense that they are not apparently linked to meaning at all. For instance, consider the restriction in English that renders sentences like "Put the hat on," Put it on" and "Put on the hat" grammatical while those like "Put on it" are not (Mc Cawley 1974). Since such constraints are not governed by semantic distinctions, their ultimate mastery by the child cannot be explained by reference to his semantic development.

In short, an adequate account of language acquisition by children must take into consideration not only the nature of early semantic development but also the way in which children deal with the formal characteristics of language. These matters are outside the scope of this paper, however.

I have chosen to study the acquisition of semantic features by children, chapter I deals with the differences between meaning postulates and semantic features. In Chapter II the semantic features are studied. chapter III deals with problems that feature analysis is faced with. In Chapter IV an evaluation of the theories of semantic developement in children is presented; the thory of component - by - component acquisition or the theory of semantic featrue acquisition is given proper prominence.

CHAPTER I: MEANING POSTULATES VERSUS SEMANTIC COMPONENTS

All approaches to the semantic analysis of natural languages are based on the insight that the meanings of lexical items are not unanalysable or undefinable wholes. This insight has been made explicit in essentially two ways. The first is based on meaning postulates, the other on semantic components into which the lexical meanings are analyzed. Meaning postulates, or semantic rules, formally introduced in Carnap (1956), might be illustrated by the following examples:

(1) (a) boy ⟶ male (b) girl ⟶ female

A rule like (1) says thast "boy" implies "male" or, what amounts to the same, that sentences like "a boy is male" or "if x is a boy, then x is male" are analytic. Meaning postulates might also involve

logical constants like "and", "or", "not", etc.

(2) (a) man ——→ male and adult

(b) woman ——→ female and adult

(c) boy or girl ——→ not adult

(d) female ——→ not male

The meaning of a lexical element is therefore specified, roughly speaking, by the set of all the meaning postulates in which it occurs. More precisely: the meaning of a lexical element of L is defined implicitly by the set of all meaning postulates associated with L.

The second approach is that of componential analysis, which underlies the linguists theories developed some time ago by such eminent linguistic as Katz and Fodor (1963), Weinreich (1966), Bierwisch (1969) and Parisi and Antinucci (Elements of Grammar, chapter 4) and others. It defines the meaning of a lexical element explicitly in terms of semantic components. These components are not part of the vocabulary of language itself, but rather theoretical elements, postulated in order to describe the semantic relations between the lexical elements of a given language. These components are connected again by logical constants. Thus we get the following oversimplified example:

(3) (a) boy: ANIMATE and HUMAN and MALE and NOT ADULT.

(b) girl: ANIMATE and HUMAN and FEMALE and NOT ADULT.

A system of such explicitly defined lexical elements might be supplemented by a set of implicational rules of the following types:

(4) (a) HUMAN ——→ (b) MALE ——→ NOT FEMALE

These implicational rules automatically complete a redundancy -free entry like (5 a) to its fully specified form (5 b):

(5) (a) boy: HUMAN and MALE and NOT ADULT.

(b) boy: ANIMATE and HUMAN and MALE and NOT FEMALE and NOT ADULT.

Rules of this type not only simplify the necessary dictionary specifications; they also express relevant generalizations about the semantic structure of the vocabulary described.

There is obviously a close connection between the two types of analysis just illustrated. In fact, as far as only systems of a particular kind are considered, a componential analysis of the type ilustrated by (3) and (4) can be direcly converted into a system of meaning postulates, and vice versa.

In terms of componential analysis, the meaning of a word is a complex of semantic components (or features, or markers) connected by logical constants. This assumption immediately allows to define certain semantic properties and realtions of lexical entries. Thus,a w'ord is semantically ambiguous if it has more than one momplex of semantic featrues assigned to it. Two entries E1 and E2 are synonynous, if their meaning consist of the same components connected by the same logical constants. E1 contains all the components occurring in the meaning of E2, but not vice versa. Thus "woman" might be a hyponym of "adult", since the former but not the latter contains e.g. the components FEMALE. E1 and E2 are antonyms, if their meanings are identical excepft that the meaning of E1 has a component Cwhere that of E2 had C', and C and C' belong to a particular subset of mutually exclusive components.

Sets of lexical entries wnose meanings have certain features in common form a semantic field.

(Lyons 1968: 428; öhman 1953). A famous example is that of kinship terms, to which we will refer in chapter III, whose elements share the feature configuration "ANIMATE and HUMAN and RELATIVE". The verbs of motion are another example.

Because of its special importance as an analytical tool, componential analysis will be studied in detail in Chapter II.

CAPTER II: SEMANTIC FEATURES

Many linguists now agree, on grounds quite independant of child language, that the most basic elements of language are not abstract syntactic configurations like grammatical relations but rather a universal set of prime semantic concepts that combine according to general and language - specific constraints to yield both words and sentences (e.g. Fillmore 1968, 1971; postal 1971; Lakoff 1971; Mc Cawley 1971). Attention to the role of meaning in language has led to the realization that many syntactic classes, configurations, and operations which were once assumed to be semantically arbitrary - i.e. not constrained by any particular meaning - are in fact governed by various subtle semantic distinctions (e.g. Postal 1971,pp. 252ff.).

The earliest and most influential propenents of componential analysis in the structuralist tradition were Hjelmslev and Jakobson. Their views are not identical, but they are similar enough as far as their advocacy of componential analysis is concerned: they both believed that the principles that Trubetzkoy (1939) had introduced into phonology could, and should, be extended into both grammar and semantics. Foremost among the representatives of this characteristcally European version of componential analysis are Greimas (1965, 1970) and Pottier (1974). Componential analysis in America appears to have developed independently.

Evidence for the psychological reality of semantic features came from experiments with memory. Clark and Stafford (1969) demonstrated that verbs are stored as a set of semantic features of tense and aspect, with tendency to simplify verbs in recall. For example, "has been watching" was often recalled as "was watching", conseving the semantic features of "past time" and of "limited duration," but omitting the feature of "completed by the present time". Clark and Card (1969) demonstrated in similar fashion that comparative sentences "are decomposed into independent semantic features for remembering".

Componential analysis was first proposed, not by linguists, as a general theory of semantic structure, but by anthroplogists as a technique for describing and comparing the vocabulary of kinship in various languages (cf. Goodenough 1956; Lounsbury 1956; Wallace and Atkins 1960). Only some years later was it taken up and generalized by such scholars as lamb (1964): Nida (1964, 1975) and Weinreich (1966) as well as by katz and Fodor (1963), in their paper, which led to the integration of semantics and syntax within the framework of transformational grammar. This last paper, because of its special prominance, will be studied in the following pages.

Katz and Fodor (1963) define semantic features as the means by which we can decompose the meaning of one sense of a lexical item into its atomic concepts, and thus exhibit the semantic structure

in a dictionary entry and the semantic relations between dictionary entries (1963; 185-186). Semantic features are analogous to phonological distinctive features in that they function as atoms of meaning that distinguish words, just as phonological distinctive features are the characteristics that distinguish phonemes. In principle, the denotative meaning of a word could be specified by listing a set of distinctive features for that word. This list would include all those features that differentiate one word from all others. For example, the words "man" and "woman" would share all their defining semantic features except one. Both have the features ANIMATE, HUMAN, but they differ on the feature of SEX. The number of shared features corresponds roughly to our intuitive judgements of the similarities among concepts.

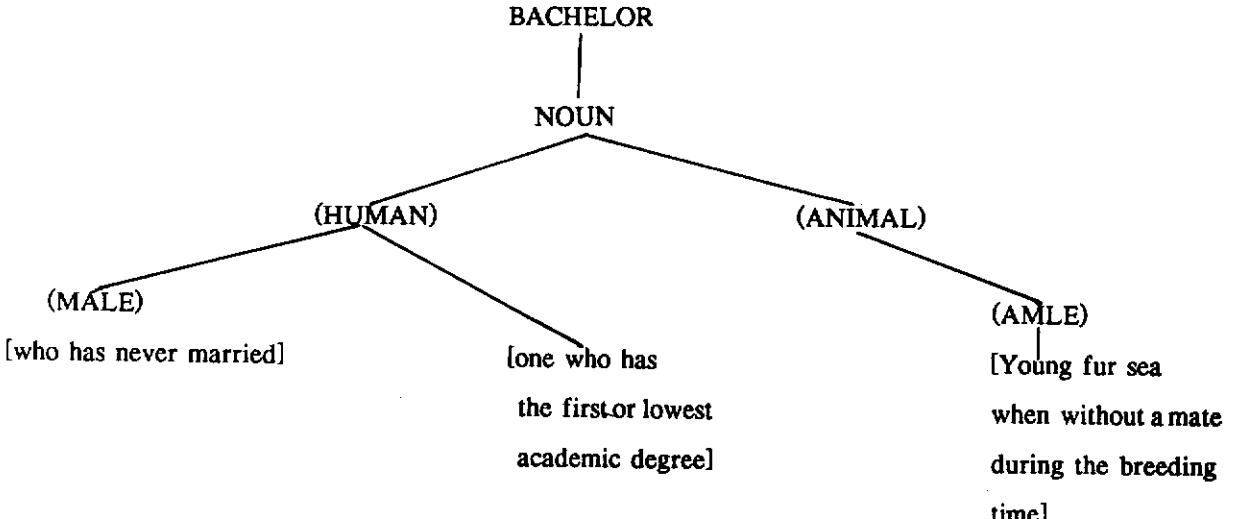
Katz and Fodor (1963), in their influential paper, "The structure of a semantic theory," argue that the distinctive feature approach is essential to any adequate theory of semantics. We can observe the same conviction in Katz (1967) and (1972). Katz and Fodor (1963) propose that a semantic theory must contain two components; a dictionary of the lexical items of the language and a system of rules called projection rules which operate on full grammatical descriptions of sentences and on dictionary entries to produce semantic interpretations for every sentence of the language. The central problem for such a theory is that a dictionary usually supplies more senses for a lexical item than it bears in an occurrance in a given sentence; for a dictionary entry is a characterization of every sense a lexical item can bear in any sentence. Thus, the effect of the projection rules must be to select the appropriate sense of each lexical item in a sentence in order to provide the correct readings for each distinct grammatical structure of that sentence.

We may contrast the typical dictionary entry for the word BACHELOR with a semantic feature representation:

Fig 1: DICTIONARY ENTRY:

BACHELOR —— NOUN
1. A young knight sevringunder the standard of another knight.
2. One who possesses the first or the lowest academic degree.
3. A man who has never married.
4. A young fur seal when without a mate during the breeding time.

fig 2: Semantic Feature Representation



Katz and fodor argue that an adequate semantic theory must have entries in the forms illustrated by Fig 2. Fig 1, they point out, will not do for a semantic theory, for the cahracterization are unsystematic. It must be revised to expose the markers, as shown in Fig 2. The unenclosed elements in Fig 2 are grammatical markers, the elements enclosed in parentheses are semantic markers; and the experssions enclosed in brackets are called distinguishers. Each sense of the word is exhaustively characterized by tracing the path from grammatical marker (noun) through semantic markers to distinguishers.

According to Katz and Fodor, semantic markers are the elements terms of which semantic relations are expressed in a theory. The distinguishers assigned to a lexical item are intended to reflect what is idiosyncratic about the meaning of that item.

Convincing as this theory appears to be, it suffers from several weakpoints. Although space does not allow me to present these in depth, noting some of them is in order here. Weinreich (1966) abserves that Katz and Fodor are concerned with an extremely limited part of the semantic competence: the detection of semantic anomalies and the determination of the number of readings of a sentence. The theoretical status, Weireich observes, of the syntactic markers in Katz and Fodor is not clear. The presence of syntactic and semantic markers with identical names (MALE, FEMALE, ABSTRACT, etc.) shows that the distiction between semantic and syntactic markers - a distinction theoretically crucial for katz and fodor - is ill - founded (Weinreich 1966: 314).

Lakoff (1976) does not find the work of katz and fodor convincing. He notices that their projection rules depend entirely on syntactic structures. They offer no semantic rules free of syntax. Lakoff points out some phenomena that any semantic theory will have to explain and this will put great strain on any interpretive semantic theory especially on one so closely related to syntax as the katz-fodor theory. Lakoff in the latter part of his paper presents several motivations for proposing a generative semantic theory. One motivation is the intuition that we know what we want to say and find a way of saying it. And there is the formal motivation. A generative semantic theory may well be, simpler and more economical than an interpretive theory. Lakoff presents several semantic features in his work. Some of them are presented here for a later reference.

1. + DS (Doing Something)

-- DS

2. + AFFECT

- AFFECT

3. EFFECT

- EFFECT

4. + POSS

- POSS

5. + PERCEPTION (to see is + PERS)

6. + VOLITION

7. ± TASTE

8. ± EXPECTATION

9. ± VALUATION

Still another problem with the Katz and Fodor theory is brought up by Mc Cawley (1968). katz and fodor (1963) treat a polysemous item such as BACHELOR as a single lexical item with a single dictionary entry containing four sub-entries, One for each of the four meanings of BACHELOR, as is shown in Fig 2 on page 10. Katz and Fodor's position like that of many lexicographers is to group together in a single dictionary entry all the readings which can be associated with a given phonological shape and belong to a single syntactic calss. There is no a priori reason for grouping items together in a dictionary at all; one could perfectly well take the notion "lexical items" to mean the combination of a single semantic reading with a single underlying phonological shape, a single syntactic category, and a single set of specifications of exceptional behavior with respect to rules. Under this conception of "lexical Items", which was proposed by Weinreich (1966) for the forst time, there would simply be four lexical items pronounced "bachelor" rather than a single four-ways ambigious lexical item.

A further problem with the katz-Fodor's theory is shown by Bolinger (1965) in his article "The atomization of meaning". He observes, "The chief fault of the marker/distinguisher dualism is that it does not appear to correspond to any clear division in natural language. (p.561)[1]. Bolinger has tried to show by examples that it is possible to do avaw withthe marker/distinguisher dualism by converting the distinguisher into a string of markers (p.560).

In spite of these drawbacks in their theory, katz and Fodor's work was an attempt to present a principled basis for the definition of linguistic meaning and this was crucial to the incorporation of semantics into grammar. Their work represents a cautious expansion of the domain of linguistic theories which regards and treats semantics as a completely secondary and subservient component of grammars. "The structure or a semantic theory" has been deservedly influential in promoting the notion of the semantic feature.

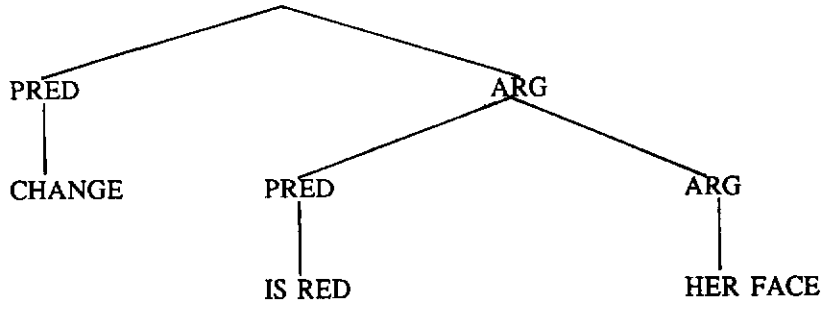
Componential analysis is a powerful device to capture explicitly and systematically the interrelation of meanings of lexical items, as Parisi and Antinucci (chapter 414) have tried to depict. They observe that the semantic component CHANGE captures the sameness of "redden" and "become red" in the following sentences:

(1) Her face reddened.

(2) Her face fecame red.

They draw these sentences as:

1- J.Katz(1972) in his paper "Semantic theory" does not accept thisand the other criticisms of Bolinger.

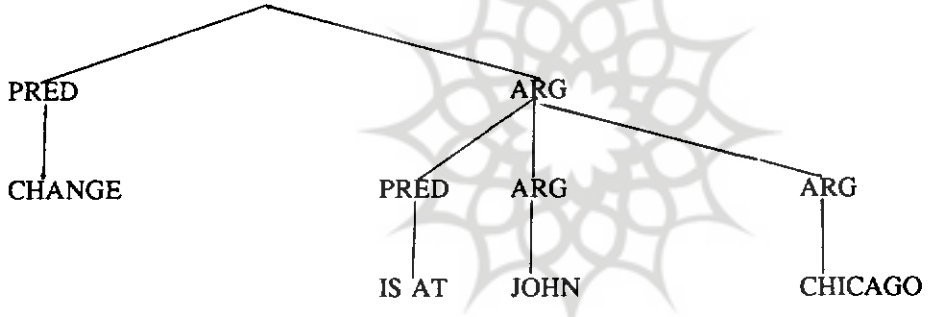


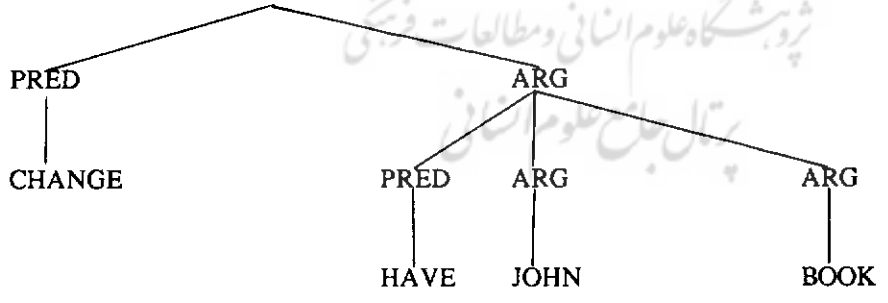
The component CHANGE exists these authors contend, as far as it explicitly represents the relation existing between "was Cool/Cooled"; "was open/opened". In the same way, they claim, the semantic component COINCIDE permits us to explain why in the sentences:

(3) John got to Chicago.

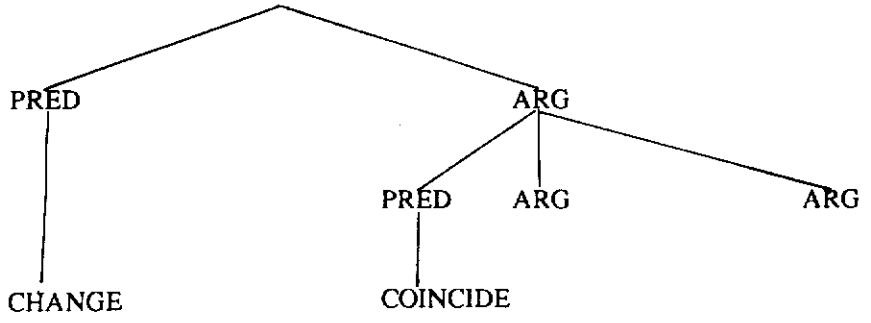
(4) John got a book.

the same predication Get can appear. If we did not have the component COINCIDE, we would have to represent the meaning of "get" in the two sentences in two completely different ways,





This would leave us unable to explain why the two different structures can be lexicalized with the same verb GET. if, however, We provide "get" with the following representation:



then it can function in both cases as a single underlying meaning for the verb "get" in both sentences (p 14)

CHAPTER III: PROBLEMS WITH COMPONENTIAL ANALYSIS

There are unsolved problems for a semantic feature analysis prevalent as this system may be.

1. Arbitrariness of Semantic Features:

The Particular classification schemes and the lists of relevant features are chosen more or less arbitrarily. We do not know whether the semantic features put forward by lakoff and represented in the present paper on page 76 are valid or not. We do not even know whether any finite set of features can be chosen so that they reflect universal properties of semantic systems.

2. Relative Importance Of Features:

A second unsolved problem of distinctive feature systems has to do with the relative importance of features. We assume that all feature are equally important. However, if we could assign differential weights to selected features, then we could weigh certain features more heavily than others.

3. Problems Of Organization And Dimensionality

This problem connot be solved by alternative feature - selection on feature - weighting systems. A distinctive feature system is inherently two dimentional, and is also likely to be hierarchical. For some sets of words, three or mor dimensions may be necessary to describe their meanings. The words in the American English kinship systems, for instance, are better represented by a three - dimentional system than two - dimentional one. The three relevant dimensions are SEX, GENERATION, and LINEARITY of relation with respect to self as used in studies done by Wallace, Goodenough, Atkins and others.

4. Psychological Reality:

Psychological reality of semantic features is an important question because many anthropologists hope that they are representing the cognitive structures existing in the minds of speakers, and not just inventing con venient summary systems of terminologies for their own benefit. And clearly this is the psychologist's interest in componential analysis. The question is most clearly posed when we have alternative componential analyses for a given domain. Is there any good way to choose between alternatives?

This question has been insightfully examined by Romney and D'Andrade, in an article called" Cognitive aspects of English kin terms (1964). In this paper they demonstrate that the Wallace and Atkins method mentioned above is not the only possible one for English kinterms. They propose an alternative analysis. (In their system, colineal and ablineal are collapsed into one category called collateral which is oppposed to "direct", SEX and GENERATION are still relevant components. And there is a new component called RECIPROCITY).

Now, Given two analyses -- that of Wallace and Atkins, and that of Romney and D' Andrade -- how can one decide which of these systems is the one which we really "carry around with us in our heads"; is it one of the two, neither, or both? It is possible that different Americans use different structures, or that an individual American uses several structurs for different purposes. Romney and D'andrade say: "it is our feeling that there will usually be several alternative analyses possible for any

set of kin terms. If we are to talk about psychological and cognitive implication of an analysis, we must specify what these implications might be. probably some analyses will be more useful for some purposes and less useful for others. There may be no single best soulution for a given system." (1964, 154)

5. The Range Of Applicability:

Studies such as the above represent some of the most detailed attempts to describe the structure of semantic domains and are of great significance not only to anthropologists, but to psychologists as well. However, a crucial question in regard to this method is that of the range of its applicability. What other domains are susceptible to this sort of analysis? Ther have been successful analyses of domains such as plant and animal taxonomies, but the rage of possibilites seems to be limited. The analysis seems to work best when dealing with discretely different referent classes. for example, a person is either male or female, either sibling or not, and so on. Each of these terms has a clearly distinguishable, objectively definable referent. But the terms such as "friend" and "acquintance" constitute a set in which the distinction seems to be in terms of degree, rather than presence or absence of a given component.

It is clear from a variety of semantic analyses that the notion of semantic components, or semantic primes (features), is a useful one. We are still a long way from adequately characterizing a set of semantic universals, but it already seems certaint that some of them will be discrete categories. Some of them will problbly be dimensions (like status, social distance, hue, and so on). It is not at all clear at this point that all the semantic information about a word can be stated in plus or minus terms, as in distinctive feature analysis in phonology. This is, however, the hope on which some semantic theories are currently being construted. componential analysis can make important contributions to understanding the nature of semantic structure. Research must be aimed at identifying what is presumably "a finite set of elementary components" (parisi and Antinucci, chap 4:49).These components in turn should prove to have a certain universality - that is, they should be useful for the analysis of lexical material in any human language.

To be continued.....