# COMPONENTIAL ANALYSIS AND SEMANTIC PRIMITIVES

A Survey of some recent approaches to the identification and description of minimal features in semantics

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Componential Analysis and Semantic Primitives

In the dissertation, a survey is made of some recent approaches in the United States of America and in Europe to the problem of identifying and describing minimal semantic features in language. Cultural anthropologists in the 1950s extended certain linguistic techniques to the analysis of kinship terminology. Their primary interest was the investigation of non-linguistic behaviour within a family or a society but semantic analysis provided a key to the investigation of the structure of these institutions.

The development of these techniques coincided with a re-awakened interest in semantics following publication of Chomsky's 'Syntactic Structures' in 1957. Six years later, Katz and Fodor made the first significant contribution for some years to the study of semantics. Their theory generated considerable debate and a number of attempts were made to refine its basic notions. Most scholars, however, have found their conceptual analysis of word meaning unsatisfactory. Many turned to modified forms of symbolic logic for a key to semantic analysis which was more to their taste. This work was undertaken in general within the framework of transformational-generative grammar, although more recent scholars have questioned the nature of the relationship between syntax and semantics. An objective common to all these linguists is the identification of semantic features in language which can be regarded as universal.

On the other hand, the European scholars surveyed occupy a quite different theoretical position. Hjelmslev's theory is hypothetico-deductive and he subscribes to a 'relativist' rather than a 'universalist' view of language. This is true also of both Greimas and Hervey. While Hjelmslev sees it as his task to provide an 'algebra' of language, both Greimas and Hervey attempt to go further by accounting for the connection between the theory and the world of the denotata.

The dissertation ends with a broad critical appraisal of the main ideas presented in the survey.

T.J.Burness December 1974

## PREFACE

I hereby declare that I have composed this dissertation myself, that work of which it is a record is entirely my own and that it has not been accepted in any previous application for a higher degree.

Date of admission as a candidate for the degree under Resolution of the University Court, 1967, No. 9 - October 1972.

I hereby declare that the conditions of the Resolution of the University Court, 1967, No. 9 and the regulations attached to the said Resolution have been fulfilled by the candidate.

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Introduction

Componential analysis is a technique for reducing the meaning of a word to its ultimate or minimal constituents. These minimal constituents (or components) are arrived at in different ways by different writers and a variety of terms is employed to describe them. But whether the writer is referring to semantic components, features, markers, primitives, criterial attributes, pleremes or sememes, his purpose is to devise a means of describing the structure of denotative or 'conceptual' meaning in such a way that the identification of these semantic elements accounts for the various interrelationships of meaning existing between words. These elements are intended to be of a contrastive, distinctive nature and in this respect are clearly analogous to the identification of distinctive features in phonology.

"A minimal definition of an item will be a statement of the semantic components necessary and sufficient to distinguish the meaning paradigmatically from the meanings of all other items in the language" (Bendix - The Data of Semantic Description).

Philosophers have been interested for at least 3 centuries in the analysis of terms into their semantic components. The aim of such speculation is to establish a universal, finite set of components from which any language would draw its atomic elements of meaning and combine them in its own unique way into senses and concepts. This quest for universal semantic components, existing independently of the semantic structure of any one language, underlies much of the recent exploratory research in semantics. The impetus for most of these investigations, particularly in the United States, has developed directly from the work on grammar of Noam Chomsky. Prior to the publication of 'Syntactic Structures' in 1957, linguists were reluctant to concern themselves with meaning. Indeed, in his very important/

important work 'Language' (1933), Bloomfield emphasised that the "Statement of meanings is therefore the weak point in language-study, and will remain so until human knowledge advances very far beyond its present state".

However, while this problem lay heavily on linguists who subscribed to Bloomfieldian ideas, the problem of meaning was a matter of interest and active concern to linguists (mainly outside the United States) who approched the whole question from a different point of view. Perhaps the most comprehensive and theoretically rigorous approach is that of the Glossematic school led by the Danish linguist Louis Hjelmslev. His work has been developed and extended by linguists in Europe and the U.S. who have been influenced by ideas in 'Prolegomena to a Theory of Language' (orig. 1943) and in his less technical 'Language' (1970). While these approaches to the description of the nature of semantic structure do share a concern to discover the componential properties of meaning, they differ in a number of important respects, not least their starting points. It will not be surprising therefore to discover that emphasis on a deductive approach leads to recognition of different concerns from that of an inductive approach. Inevitably, adherents of each approach will be concerned to a greater or lesser extent with such questions as the admissibility and importance of intuition, of questions of universality and relativism, of the relevance of logical categories in the establishment of the semantic structure of a language. The studies which follow will reveal these differences in greater detail.

However, one of the corner stones of the modern approach to a study of semantics is the recognition that such a study must be <u>linguistic.</u> "A linguistic theory .... must seek a constancy .... when this constancy has been found and described, it may then be projected on the 'reality' outside language, of whatever sort that 'reality' may be (physical, physiological, psychological, logical, ontological) so that /

so that, even in the consideration of that 'reality', language as the central point of reference remains the chief object .... with linguistic structure as the dominating principle" (Hjelmslev). That is, the proper concern of semantics is an exploration of the various semantic relations that exist between words and sentences in a language.

The term 'componential analysis' has been employed by anthropologists for some time as a technique in studying kinship relations. Studies by Lounsbury and Goodenough and Conklin published shortly before 'Syntactic Structures' attracted the attention of linguists and led, in the early 1960's, to applications in linguistics.

1. Anthropological Insights : Componential analysis of kinship terms

At a time when the mainstream of linguistic enquiry in the United States was concerned with a linguistics that saw the investigation of meaning as falling outside its scope, cultural anthropologists were very much interested in the whole question of meaning. The reason for this relates to the anthropologist's interest in human behaviour in society and to study this he "uses semantic analysis of a society's kinship terminology only as a tool for getting at the structure of non-linguistic behaviour within the family and kindred of that society. The best works in this field have consisted of careful semantic studies followed by careful studies of social interaction between variously related pairs of kinsmen" (Lounsbury). Anthropologists such as Lounsbury, Goodenough and Conklin were already familiar with the techniques that had been developed in American schools of linguistics for describing and recording the phonological and syntactic structures of languages, particularly those of the native Indian tribes or of tribes whose languages were in danger of disappearing altogether. An analogy is drawn by Goodenough between how the linguist arrives at the phonemes of an object language and how the anthropologist identifies significant kinship relations. "A linguist arrives at a statement of (the acoustical percepts which in varying combinations make up the phonemes of a language) ... by testing various hypotheses which he formulates about them until he finds a hypotheses which fits the acoustical phenomena as he has noted them ... The first step in this procedure is, of course, to record as many discriminable differences as possible in the acoustical phenomena by means of a phonetic system of notation .... It is an object of linguistic analysis by systematically examining the mutual distributions (in recorded speech) of the acoustical phenomena as phonetically noted, to produce the most adequate possible theory as to what are the languages phonemes, its elementary phonological components".

In this respect, there are two techniques for defining a class. The first is to name all the members of a class; in this instance, a phoneme is defined by listing all the allophones which belong to it. A second way is to define it as the class of phones sharing certain identified distinctive phonetic features. In the case of the analysis of kinship terms, application of the first technique would result in information on the segmentation of the semantic field by a process of definition by naming. Such definitions, however, do not show the underlying principles of organisation and these will be shown only if by application of the other technique the analysis can lead to definitions in terms of distinctive semantic features which enable the semantic structure of the whole set to be identified. This is what Conklin refers to as a "lexical set" i.e. a set consisting "of all semantically contrastive lexemes which in a given, culturally relevant context share exclusively at least one defining feature." The semantic range of all such lexemes defines the "domain" of the lexical set.

But, as Lounsbury points out, these defining features, "the so-called obligatory categories in language", may be 'covert' rather than 'overt'. To illustrate the point he gives an illustration from English and Spanish forms:

| | | | | | |
|---|---|---|---|---|---|
| tio | : | tia | uncle | : | aunt |
| hijo | : | hija | son | : | daughter |
| abuelo | : | abuela | grandfather | : | grandmother |
| hermano | : | hermana | brother | : | sister |

The semantic relation male:female is common to each pair but it is only in Spanish that it is overtly recognised in the morphological structure of the terms. To support his case for recognition of covert categories, Lounsbury draws attention to Harris' criticism of the view that the linguistic structure of an utterance is presumed to be fully stated by a list of the morphemes which constitute /

constitute it and by their order. Harris noted that the Latin morphemes -us, -um, -i, -os "are considered as expressing ... such categories as case and number", and that these categories "are not readily identifiable as consisting of any particular phonemes in the utterances". Accordingly, he called them 'components' but, as Lounsbury points out, although in Harris's methodology the components are labelled semantically, he does not in fact deal directly with meaning but with 'linguistic meaning' which is defined distributionally.

From this starting point, Lounsbury sets out to develop a semantic approach to the componential structure of the kinship terminology of the Pawnee. In this respect he is dealing with a lexical set of a sort that Ullman (1973) has called a 'concrete field with discrete elements'. The set is a paradigm except that no component is ever represented directly in the segmental structure of the forms but only 'such that each (morpheme) in the set is identified by its contrast with all the others in the set' (Harris, 'Language' 24, 1948). So in Lounsbury's terms, the paradigm is a structure or set of 'covert' categories and the analysis which he develops will concern "the components ... semantic features rather than distributional features" of Pawnee kinship usage. There is yet a strong analogy between the techniques of structural linguists and cultural anthropologists illustrated by Lounsbury as

| | | |
|---|---|---|
| phones | : | unique events |
| kinsmen | : | unique individuals |
| phone type | : | a class of phones heard and transcribed as the same by the phonetician |
| kin type | : | a class of kinsmen given the same designation by the ethnologist |

Phoneme/

phoneme : a class of non-contrastive phone types which share a distinctive bundel of phonetic features

kin class : a class of kin types which are not contrasted terminologically and which share some distinctive bundle of semantic features

In his analysis of Truk kinship terms, Goodenough employs the same approach as Lounsbury. "The first step in analysis is to gather together all expressions whose denotata make it appear on inspection that there may be some common element in their significata". If the term for 'kinsman' can be identified, all to the good, since all expressions whose denotata are entirely included within the denotata of this expression will therefore belong to the kinship set. Goodenough's informant provided him with the information which is contained in the following chart. In addition, the lexeme tefej was seen to be capable of denoting something already implied by each of its lexemes in the table and it can therefore be assumed that it signifies the universe in question. Goodenough analysed the terms in the table in respect of their "conceptual variables and their values" as follows:

| Lexemes | Samples of Denotata |
|---|---|
| semej (*sama, *ji) | Fa, FaBr, MoBr, FaFa, MoFa, FaFaBr, FaMoBr, MoFaBr, MoMoBr, FaSiSo, FaSiDaSo, SpFa, SpMoBr, SpFaBr, SpFaSiSo, MoSiHu, FaSiHu, etc. |
| jinej (*jina, *ji) | Mo, MoSi, FaSi, MoMo, FaMo, FaFaSi, FaMoSi, MoFaSi, MoMoSi, FaSiDa, FaSiDaDa, SpMo, SpMoSi, SpFaSi, SpFaSiDa, FaBrWi, MoBrWi, etc. |
| semenapej (*sama, *napa, *ji) | Fa, FaFa, MoFa. |
| jinenapej (*jina, *napa, *ji) | Mo, FaMo, MoMo. |
| jinejisemej (*jina, *ji, *sama, *ji) | FaSi, FaSiDa, FaSiDaDa, FaMo, FaMoSi, FaMoMo, etc. |
| pwiij (*pwii, *ji) | For male ego: Br, MoSiSo, FaBrSo, FaMoBrSo, FaSiSoSo, WiSiHu, etc. — For female ego: Si, MoSiDa, FaBrDa, FaMoBrDa, FaSiSoDa, HuBrWi, etc. |
| feefinej (*feefina, *ji) | For male ego: Si, FaBrDa, MoSiDa, FaMoBrDa, FaSiSoDa, but NOT WiBrWi. — For female ego: no denotata. |
| mwääni (*mwääni, *ji) | For male ego: no denotata. — For female ego: Br, MoSiSo, FaBrSo, FaMoBrSo, FaSiSoSo, but NOT HuSiHu. |
| mwēgejej (*mwēgeja, *ji) | For male ego: same as feefinej. — For female ego: same as mwääni. |
| jēēsej (*jēēsa, *ji) | For male ego: SiHu, WiBr, FaBrDaHu, etc. — For female ego: BrWi, HuSi, FaBrSoWi, etc. |
| pwynywej (*pwynywa, *ji) | For male ego: Wi, WiSi, BrWi, FaBrSoWi, etc. — For female ego: Hu, HuBr, SiHu, FaBrDaHu, etc. |
| jääj mwään (*jaa, *ji, *mwääni) | For male ego: o.Br, o.MoSiSo, MoBr, MoMoBr. — For female ego: o.Si, o.MoSiDa. |
| mwäninyki (*mwääni, *nyky, *ji) | For male ego: y.Br, y.MoSiSo, SiSo. — For female ego: y.Si, y.MoSiDa. |
| neji (*nēwy, *ji) | So, Da, ChCh, BrCh, SiCh, MoBrCh, MoMoBrCh, FaBrChCh, MoSiChCh, FaSiSoChCh, FaSiDaSoChCh, FaMoMoBrChCh, etc. |

A represents the constant of being tefei to ego (i.e. the person from whom the relationship is traced);

B seniority of generation, with the values B1 senior, B2 same and B3 junior;

C sex of the relative, with C1 male and C2 female;

D Symmetry or parallelism of relationship to the connecting matrilineal group, with D1 symmetrical and D2 asymmetrical;

E sex relative to ego's sex, with E1 same sex, E2 opposite sex;

F mode of relationship, with F1 consanguineal, F2 affinal;

G age relative to ego's age, with G1 older and G2 younger;

H matrilineal group membership relative to ego's, with H1 member of ego's group, H2 member of ego's father's group and H3 member of neither group;

J collateral removal, with J1 lineal and J2 not lineal.

This notation now allows the contents of the kinship terms to be expressed in the form of conceptual variables. This method of notation "is a method of symbolising concepts which is functionally and structurally equivalent to the phonemic method of symbolising speech forms. Such concept forms as AB2D1E1 are structurally analogous to morphemes. The structural phonological relationship of English pet and bet, for example, parallels the structural conceptual relationship of AB1C1 and AB1C2".

However useful this method of notation was for the semantic analysis of kinship terminologies, Goodenough clearly foresaw this as only one application out of large range of possibilities. "I am convinced that further development of a notation for sememes will open the way for equally rigorous analysis of the content of conceptual systems as far as linguistic and other behaviour forms provide a pathway /

pathway into them".

It would be a mistake, however, to regard these 'universals' as other than relations which are determined by the strictly limited possibilities of relations of a genealogical nature. A kinship system may be analysed in more than one way. For example, in the proportions -

(1) brother - sister : father - mother : son - daughter

(2) brother - sister : uncle - aunt : nephew - niece

the pair 'brother - sister' in sentence (1) has the component 'direct line' whereas the same pair in sentence (2) has the component 'co-lineal'.

Each analysis may be considered 'correct' because it rests on a different but consistently interpreted set of proportions. This is what anthropologists mean when they refer to the 'cognitive validity' of semantic components. The components are culture-related.

Goodenough, Conklin and particularly Lounsbury have all developed their ideas and notational methods from those that have been discussed here. However, the techniques which they demonstrated in the late 1950's and early 1960's coincided with a period in the development of linguistics in which new methods and fresh approaches were eagerly taken up, particularly those that might advance discussion on the general question of the existence of universals in language. It is perhaps ironic that the ethnologists themselves were anxious to justify their approach to semantic analysis on the grounds that the techniques were essentially those employed by linguists in phonology and that the very notion ' component' was merely an extension of the term as it had been used in morphology.

Georges Mounin (1972) has produced a semantic analysis of the Kinship terms of French in the following table, constructed on the same basis as for the phonological /

phonological system: (G + O is generation of 'ego')

grandpère
Sm, G + 2, L1
grand-mère
Sf, G + 2, L1
père
Sm, G + 1, L1
mère
Sf, G + 1, L1
frère
Sm, G + O, L2
soeur
Sf, G + O, L2
fils
Sm, G - 1, L1
fille
Sf, G - 1, L1

petit-fils
Sm, G - 2, L1
petite-fille
Sf, G - 2, L1
oncle
Sm, G + 1, L2
tante
Sf, G + 1, L2
cousin
Sm, G + O, L3
cousine
Sf, G + O, L3
neveu
Sm, G - 1, L2
nièce
Sf, G - 1, L2

| | | grandpere | grandmere | pere | mere | frere | soeur | fils | fille | petit fils | petite fille | oncle | tante | neveu | niece | cousin | cousine |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Génération | G + 2 | + | + | | | | | | | | | | | | | | |
| | G + 1 | | | + | + | | | | | | | + | + | | | | |
| | G + O | | | | | + | + | | | | | | | | | + | + |
| | G - 1 | | | | | | | + | + | | | | | + | + | | |
| | G - 2 | | | | | | | | | + | + | | | | | | |
| Sexe | Sm | + | | + | | + | | + | | + | | + | | + | | + | |
| | Sf | | + | | + | | + | | + | | + | | + | | + | | + |
| Lignée | L1 | + | + | + | + | | | + | + | + | + | | | | | | |
| | L2 | | | | | + | + | | | | | + | + | + | + | | |
| | L3 | | | | | | | | | | | | | | | + | + |

## 2. The Semantic Component and its Critics

In 1963, Katz and Fodor published their influential article "The Structure of a Semantic Theory" which became the basis for the rules of the semantic component in Chomsky's 'Aspects of the Theory of Syntax' (1965). Katz and Fodor, accepting as their starting point the case outlined in 'Syntactic Structures', could then state that "linguistic description minus grammar equals semantics". In this respect transformational grammars are claimed to offer a solution in that they provide "rules which generate the sentences of the speaker's language" and these rules "generate infinitely many strings of morphemes which, although they are sentences of the language, have never been uttered by speakers".

The semantic theory sought to provide a systematic account of a speaker's interpretative competence by accounting for his ability

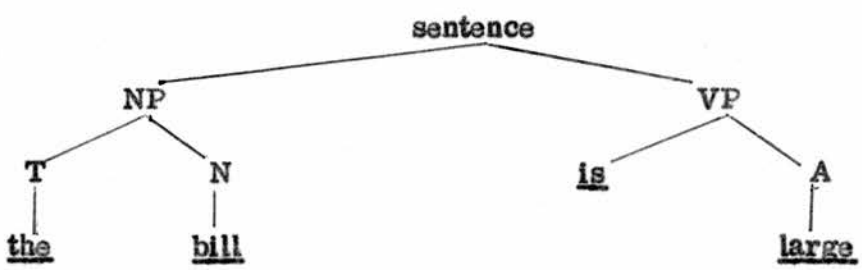
(a) to distinguish the number and content of the readings of a sentence

(b) to detect semantically anomalous sentences

(c) to identify paraphrases, and

(d) to mark every other semantic property or relation that plays a role in this ability.

Katz and Fodor noted that certain features of sentences cannot be fully accounted for in terms of syntactic description alone. The sentence "The bill is large' could refer to either (a) a document requiring payment or (b) the beak of a bird.




"... the fact that this sentence is ambiguous between these readings cannot be attributed /

attributed to its syntactic structure since, syntactically, its structure on both readings is (the same)".

The ambiguity of the sentence "The bill is large" arises from the two possible meanings of the word bill. Consequently a full description of a language would have to include a full list of all the possible meanings of the individual words. But K. and F. also recognised that it is necessary to know not only the meanings of individual words to understand a sentence but also the syntactic relations between them; and in this respect the semantic rules applied to sentences the syntactic structures of which already existed in the form of phrase structure tree diagrams.

Since Katz and Fodor's theory was published some two years before "Aspects", no reference was made to the difference between deep and surface structure. Clearly, however, one of the main justifications for deep structure is that the meaning relations between sentences are established at this level and consequently deep structure phrase markers were proposed as the input to the semantic component which was considered to operate by means of the sort of projection rules proposed by Katz and Fodor.

It is only right to point out at this stage that Katz has continued to develop his theory since publication of the original statement by Katz and Fodor in 1963. He has replied specifically to many of the comments made by his critics (see especially Weinreich in next section) and revised a number of the statements to be found in the 1963 article, particularly as a result of later revisions in the syntactic theory itself.

A more representative statement of Katz's current thinking is contained in his 'Semantic Theory' published in 1972. For the purpose of this survey, however, only the 1963 article has been considered in any detail. Because of its impact, many /

many linguists once more became interested in attempting to establish the relationship between syntax and semantics. As we shall see in chapter four, this has led a number of linguists to question the nature of the relationship and particularly the role of syntax.

The grammar that Katz and Fodor referred to in their dictum "Linguistic description minus grammar equals semantics" was that outlined in "Syntactic Structures". Briefly, Chomsky proposed that the system of grammatical rules for generating sentences should consist of three parts

(1) phrase structure rules,

(2) transformational rules, and

(3) morphophonemic rules.

The application of rewriting rules in the phrase structure component would result in the production of structural descriptions which could be expressed in the form of tree diagrams. These phrase markers would then be operated on as strings in the transformational component of the grammar. The transformational rules would be of different kinds (optional, obligatory, generalised) and operations such as permutation, deletion and addition would be applied where appropriate to the underlying strings.

The function of the morphophonemic component is to provide a set of rules for converting the output of the transformational component - the symbols in terminal strings - into a representation of their actual spoken form e.g. take + past / took, walk + past / walked.

The initial problem facing Katz and Fodor was to determine what mechanisms a semantic theory employs in reconstructing the speaker's ability to interpret sentences in isolation. The first component required, they deduced, is a dictionary of that language because (1) a grammar cannot account for the fact that /

that some sentences which differ only morphemically are interpreted as different in meaning (e.g. "The tiger bit me" and "The mouse bit me") while others that also differ only morphemically are taken to be the same in meaning (e.g. "The oculist examined me" and "The eye doctor examined me"); nor (2) can a grammar alone satisfactorily explain why certain sentences which have very different syntactic structures are synonymous.

But a dictionary and a grammar in themselves are still insufficient to account for the fluent speaker's ability to interpret sentences. Were a machine supplied with this information it is clear that it would have the immediate problem of selecting the correct sense of a dictionary entry for any word containing more than one entry in the dictionary. It has no means of recognising such semantic relations as may exist between one element and another in the sentence. Accordingly, Katz and Fodor concluded that a semantic theory must contain not only a dictionary of the lexical items of the language but "a system of rules (which we will call projection rules) which operates on full grammatical descriptions of sentences and on dictionary entries to produce semantic interpretations for every sentence of the language". The projection rules must account for the fluent speaker's ability to detect semantic ambiguity in a sentence, to sense anomalies and to recognise sentences which are paraphrases of each other.

The traditional dictionary of a language normally indicates the grammatical status of each entry and then a list of the various senses in which it may be found, e.g.

<u>bachelor</u>:

bachelor - Noun

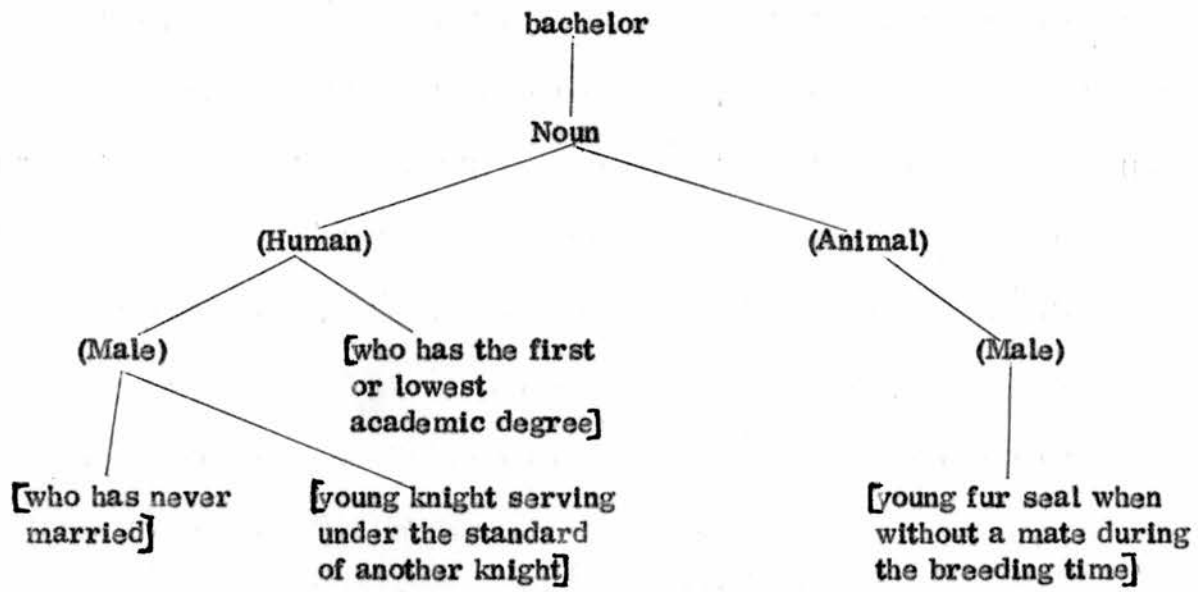
1 A young knight serving under the standard of another knight

2 One who possesses the first or lowest academic degree

3 A man who has never married

4 A young fur seal when without a mate during the breeding time

Katz and Fodor translated this information into a tree diagram because for their purposes it was a more useful form for bringing out certain essential notions in the development of the theory. Their purpose was to "decompose the meaning of a lexical item (on one sense) into its atomic concepts" by means of which they are able "to exhibit the semantic structure in a dictionary entry and the semantic relations between dictionary entries".




To distinguish the atomic concepts, the terms grammatical markers (elements not enclosed in brackets), semantic markers (elements in round brackets) and distinguishers (elements in square brackets) were devised.

The grammatical marker 'noun' indicates that only those senses of a word classified as that part of speech are being displayed. The terms in round brackets, the semantic markers, are the 'atomic concepts' which are found throughout the dictionary distinguishing 'sense characterisations' between whole sets of words e.g. human/non human; male/female; animate/inanimate. The semantic distinguishers in square brackets are intended to distinguish between the senses of a particular word and are therefore specifically related to that word.

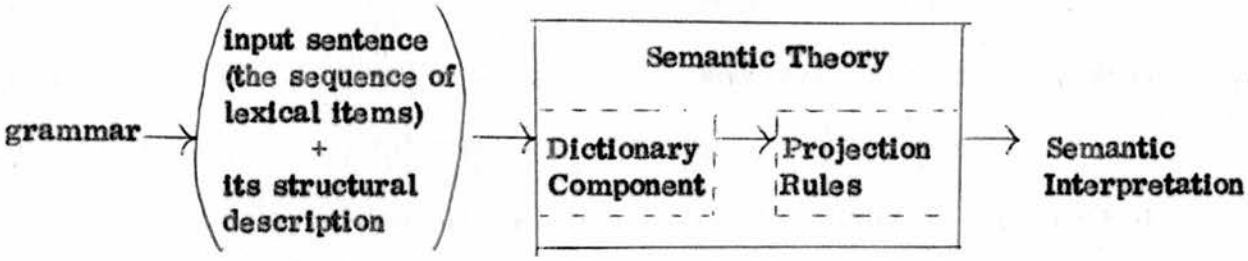
Katz /

Katz and Fodor suggest that certain distinguishers could be re-analysed as semantic markers because they make more general distinctions but it would greatly increase the number of semantic markers. As will be seen in the next section, many critics have taken issue with Katz and Fodor on this point. A method of reducing the number of markers that have to appear in each dictionary element is suggested by Katz and Fodor, namely to include redundancy rules which indicate that certain markers are automatically entailed by superordinate markers. 'Human', for example, would subsume the markers (animate), (organic), (physical object) etc.

Having determined the nature of the dictionary, the other main problem was to devise a procedure that could cope with the need to combine individual dictionary meanings in a sentence in such a way that a meaning for the whole sentence was arrived at that was semantically acceptable. In 'Syntactic Structures', Chomsky pointed out that one of the unsatisfactory characteristics of a phrase structure grammar is that (even with context-sensitive rewrite rules) phrase structure rewrite rules operate on single symbols. Consequently, any attempt to generate all but the most simple of sentences immediately comes up against the problem that the selection of individual words in a sentence depends on what other words have already been selected. To some extent, context-sensitive rewrite rules take care of the problem but Chomsky's proposal of transformational rules that operate on strings of symbols (i.e. the terminal strings of the phrase structure rules) provided a much more economical answer.

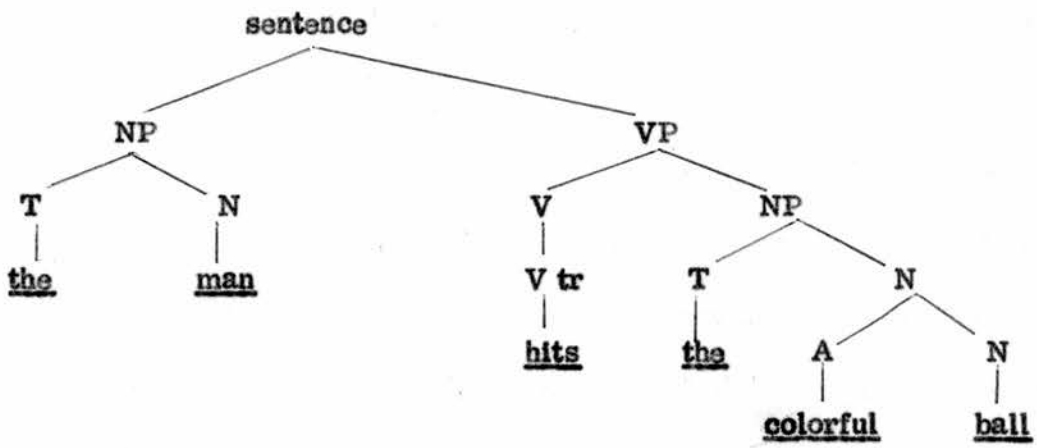
As noted previously, Katz and Fodor took as their starting point the provision of a structural syntactic description of each sentence as the input to the semantic theory. To cope with a problem similar to that solved by Chomsky's transformational rules, Katz and Fodor proposed a system of projection rules/

rules which would govern the combination of individual dictionary meanings in such a way that an acceptable semantic interpretation of a sentence could be arrived at.




While emphasising that the projection rules "can take account of information about the transformational history of a sentence which is not represented in a tree diagram", Katz and Fodor illustrate the operation of the projection rule component on each derivation of sentence whose constituent structure "can be represented by a tree diagram".

They supply the derived constituent structure of the sentence "the man hits the colorful ball" as -




The projection rules require that words occurring together in units at the lowest level of the tree diagram must be combined first. The process goes on up the tree combining larger and larger units according to the structural description until the meaning of the whole sentence is arrived at. In this particular example/

example that would mean that the and man or colorful and ball could be combined as a first step but not hits and the or man and hits because this would violate the syntactic structure of the sentence.

However, it is clear from the discussion of the dictionary component that such a structure at this stage has potentially more than one sense interpretation since the lexical items themselves have a number of possible senses associated with them. To overcome this problem, Katz and Fodor take account of context-sensitivity in the notion of selection restrictions. They illustrate how the projection rules would operate in the amalgamation of colorful and ball.

The set of components (markers, distinguishers, and selection restrictions) for colorful are:

(1) Colorful → adjective → (color) → [abounding in contrast or variety of bright colors] ⟨(Physical Object) v (Social Activity)⟩

(2) Colorful → adjective → (Evaluative) → [Having distinctive character, vividness, or picturesqueness] ⟨(Aesthetic Object) v (Social Activity)⟩

Those for ball are:

(1) Ball → Noun concrete → (Social Activity) → (Large) → (Assembly) → [for the purpose of social dancing]

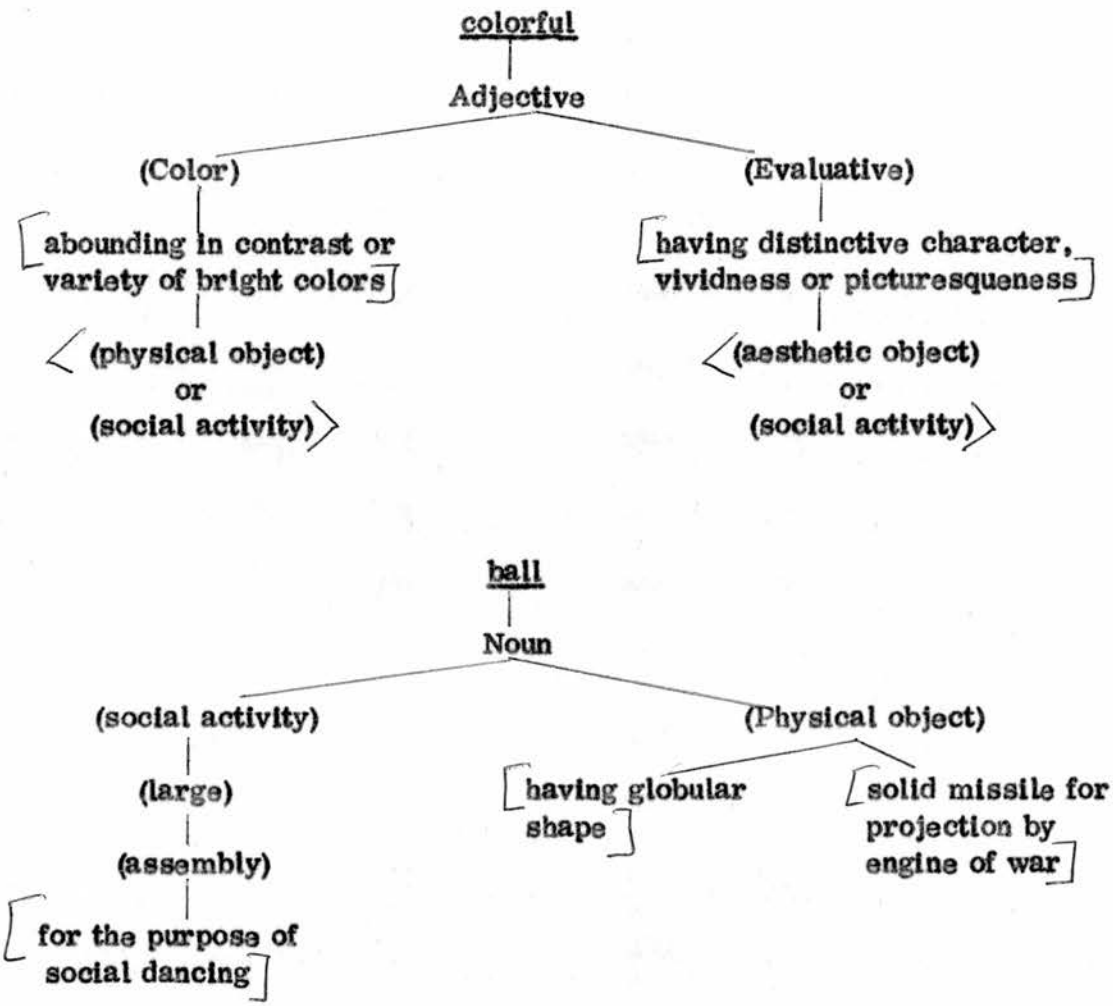
(2) Ball → Noun concrete → (Physical Object) → [Having globular shape]

(3) Ball → Noun concrete → (Physical Object) → [Solid missile for projection by engine of war]

These may be represented as tree diagrams:

colorful

Adjective /




The selection restrictions shown in angle brackets at the end of the branches for colorful indicate which types of noun can be associated with the various senses of the adjective. In this way, there is no need to list (even if it were possible) all the individual nouns to which colorful could apply because all that is required is that any such noun will have the appropriate semantic marker in its dictionary entry. Thus, colorful in the sense of 'abounding in contrast' can apply to nouns which include among their markers (physical object) or (social activity).

In contrast, Katz and Fodor give an example of a semantically anomalous expression. 'Spinster insecticide' would be regarded as unacceptable by a fluent speaker of English and this would be predicted on the basis of the projection rule (R1) and the dictionary entries for the individual lexical entries.

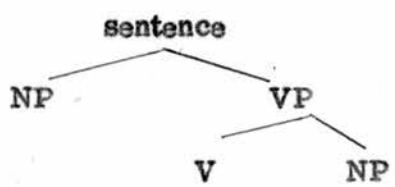
Spinster → Adjective → (Human) → (Adult) → (Female) →

[who has never married] <(Human)>

The projection rule assigns no reading to spinster insecticide (that is, it is anomalous) because the path for **insecticide does not contain the semantic** marker (Human) and so the selection restriction attached to spinster cannot be met.

So the projection rules for combining adjectives and nouns require that all the semantic markers of both the adjective and the noun are amalgamated (selection restrictions permitting). Of the six possible amalgamations of colorful and ball, only four derived paths satisfy the selection restrictions. Three of these include the [brightly colored] sense of colorful which can go with all three senses of ball because it can apply to (physical object) or (social activity). The other possible amalgamation is the [picturesque] sense of colorful with the [dance] sense of ball. But this sense of colorful cannot apply to either of the (physical object) senses of ball because it only applies to nouns which have either (aesthetic object) or (social activity) as markers.

The next step in the process of amalgamation would be to add the [some contextually definite] to man and all four combinations of colorful ball leaving the constituent structure tree as




The next stage is the amalgamation of the verb hits. Again, there are selection restrictions and for verbs these will relate to possible subjects and objects. So that the two senses of hits read:

(1) hits → Verb → Verbtransitive → (Action) → (Instancy) → (Intensity) → [collides with an impact] < subject: (Higher animal) v (improper part) v (Physical object). Object: (Physical object) >

(2) /

(2) hits → Verb → Verb transitive → (Action) → (Instancy) → (Intensity) →
[strikes with a blow or missile] ⟨ Subject: (Human) v (Higher Animal),
Object: (Physical object), Instrumental: (Physical object)⟩

In sense (1), both subject and object can be any (physical object); in sense (2) the object may still be (physical object) but the subject must be (human) or (higher animal). The combination of hits and the colorful ball in its four senses would result in two of the senses being marked as anomalous - [brightly colored] or [picturesque dance] - since they have no marker (physical object) which is required by hits as its direct object. Since man included the markers (physical object) and (higher animal) there is no difficulty in amalgamating man as subject with both senses of hits.

So, after the operation of the projection rules, there are four acceptable amalgamations rendering four possible meanings of the sentence.

"The man collides with the colorful globular shape."

"The man collides with the colorful missile."

"The man strikes the colorful globular shape."

"The man strikes the colorful missile."

Katz and Fodor are aware that by providing such detailed notes on the operation of the dictionary component and the projection rules, it may be forgotten that they are concerned to outline the "abstract form" of semantic theory and not to produce a manual of operation. Nonetheless, while they regard the examples given as merely illustrative of how results of a linguistic analysis may be formally presented to the projection rule component, they do claim they have tried to make their examples "account for the fundamental semantic features" of which they are composed. In spite of the many difficulties which it will be seen attach to this attempt, Katz and Fodor's ideas on breaking down word meanings/

meanings into semantic features or 'atoms' opened up for many linguists the renewed possibility of evolving a systematic theory of meaning that took account of both lexical and syntactic information.

Before considering some of the responses that Katz and Fodor's paper provoked, it is useful to recognise the relationship of their ppoposals to those of Chomsky' contained in 'Aspects of the Theory of Syntax' published some two years later in 1965.

In both 'Syntactic Structures' and 'Aspects of the Theory of Syntax' Chomsky proposed a three-component grammar. However in the latter he set out to account for the complete linguistic competence of the native speaker, incldding his ability to produce and understand meaningful sentences. He identified the three major components of the grammar as the phonological component, the syntactic component and the semantic component. In broad terms, the phonological component may be compared with the morphophonemic rules of 'Syntactic Structures' (although there are differences between the rules of both). The syntactic component includes a set of base rules, partly equivalent to the phrase structure rewriting rules and a lexicon. The semantic component is completely new and consists of rules for the semantic interpretation of the meaning of sentences.

Also new are the concepts of deep structure and surface structure although a distinction somewhat similar was implicit in the 1957 version. In the latter the output of the phrase structure rules consisted of underlying strings on which the transformational rules operated to provide the input for the morpho-phonemic component. Kernel sentences were those sentences which required only obligatory transformations and complex sentences were those resulting from optional transformations. In 'Aspects', deep structures are generated

also /

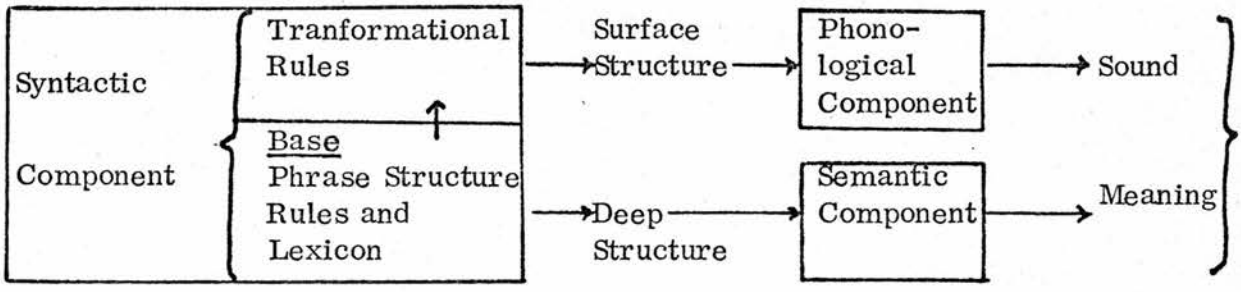
also by the phrase structure rules included in the base of the syntactic component and transformational rules operate on these deep structures to translate them into surface structures for interpretation by the phonological component. In the 1965 version of the theory, Chomsky emphasises that every sentence has both a deep structure and a surface structure. The final surface structures of both simple and complex sentences are obligatorily determined in deep structure by markers which have the function of indicating which transformations are to be applied. Passives, negatives and questions, previously the result of optional transformations are now determined in the deep structure as a result of the respective transformation marker. Optional transformations in fact no longer operate in the sense that they can change 'meaning' and where they do exist their function will be related to the marking of stylistic variance. Likewise with generalised transformations, the deep structure contains all the underlying strings that will be incorporated into the final sentence. Kernel sentences are now described as those which involve "a minimum of transformational apparatus in their generation".

The case for deep structure is that knowledge of the underlying strings which go to make up a sentence is essential to account for the native speaker's understanding of similarity and ambiguity relations between sentences. The essential role of deep structure relations for understanding semantic relations leads to the inevitable suggestion that deep structure should contain all the information necessary for the semantic interpretation of a sentence. The rules of the base component provide the structural information necessary for semantic interpretation but is is the rules of the semantic component that carry out a semantic interpretation to arrive at the meaning of a sentence. In the same way, the surface structure contains all the syntactic information necessary for

phonological /

phonological interpretation. A deep structure and a surface structure are generated by the syntactic component for every sentence: the deep structure is the output of the base rules and the input to the semantic component while the surface structure is the output of the transformational rules and the input to the phonological component. Consequently, the function of the semantic and phonological components is purely interpretive.

The diagram represents the relationship and function of the components:




The lexicon is part of the base of the syntactic component but it clearly has semantic importance. As Katz and Fodor noted, the grammar of 'Syntactic Structures' had no means of preventing the generation of sentences that were syntactically sound but semantically deviant. In 'Aspects', Chomsky employs the terms "strict subcategorisation features" and "selectional features" to deal with this problem. We might well ask if this leaves anything over for the semantic component to deal with.

Strict subcategorisation features are those which apply to major word classes such as nouns and verbs in such a way that they can be subclassified in terms of the syntactic frames in which they may occur. For example, the rewriting of V as a particular verb may depend on whether the syntactic frame requires a transitive or an intransitive verb. All transitive verbs might have the feature ( ----NP) which would indicate only verbs of this subcategory could be selected to appear in a sentence with a direct object.

Selectional features refer to the possible choice of words in relation to other words occurring in the same string. Chomsky states that to avoid such

sentences/

sentences as "John frightens sincerity" the most economical method is to include in the lexicon features of nouns such as count/mass, animate/inanimate, Human/non-human, male/female and contextual features appropriate to verbs, adjectives and other parts of speech. Since the phrase structure rewrite rules of the base component produce preterminal strings into which particular words from the lexicon are chosen for insertion, only those words with the 'correct' contextual features would be eligible for selection. The lexicon, therefore, should contain all the information that is idiosyncratic to a particular lexical item - contextual, semantic and phonological features. It will be seen therefore that each lexical item is a cluster of all the features relevant to its use in the language.

The phrase structure rules of the base will generate hierarchical tree diagrams containing slots into which items from the lexicon can be inserted. If an item is acceptable, the whole cluster of features appropriate to that word will be inserted and these features, along with the deep structure framework, will be the input of the semantic component. Similarly after all the transformations have been performed on the output of the base component, the surface structure along with the phonological features provided in the lexicon will be the input of the phonological component from which will emerge a phonetic representation. It will be clear from this that although they are not completely compatible there are significant similarities between Katz and Fodor's proposals for the dictionary component and those of Chomsky for the lexicon. Although the semantic theory envisaged as its input syntactic structural descriptions from the grammar, it is clear that in the 'Aspects' model, the dictionary element of Katz and Fodor's essentially two-stage theory has been absorbed into the new base component as the lexicon. In this capacity, the lexicon provides for the deep structures generated by the base rules all the necessary lexical information/

information in the form of semantic features and it is this which goes as the input to the semantic component. This would consist of Katz and Fodor's projection rules for combining the markers of individual words in a string to render semantic interpretations for sentences.

Chomsky's decision to formulate lexical entries as sets of features which could be marked as either positive or negative for each lexical item went some way to answering one of the difficulties in the Katz and Fodor formulation. It is often difficult to decide whether one marker should precede or follow another in a hierarchical structure and a formulation which did not employ the tree diagram but nonetheless indicated the selectional restrictions would be an advantage. However, such a formulation would entail separate lexical entries for each sense of the word.

There are more fundamental problems relating to the nature and status of the markers themselves, however. Clearly they are arrived at by intuition and to that extent it is only reasonable to wonder to what extent the setting up of the lexical item 'bachelor', for example, depends on the semantic notion 'bachelor'. It is knowledge of the world that predetermines markers such as (animal), (human), etc. In addition, in the stating of semantic markers, there must be a problem relating to the point at which the distinction is to be made between a marker and a distinguisher. Markers are required to reflect the native speaker's ability to detect anomalous and ambiguous sentences but this may require the expression of an arbitrarily large number of semantic markers in itself.

Critics

(a) D. Bolinger:

These and a number of other objections were taken up by Dwight Bolinger in an /

an article published in "Language" in 1965 called 'The Atomization of Meaning'. He examined the relationship of markers and distinguishers in relation to Katz and Fodor's claim that the "system of semantic markers should reflect exactly the systematic features of the semantic structure of the language". Bolinger felt that distinguishers would probably have to be reanalysed into further markers and distinguishers for each dictionary entry if the theory were to account for all the disambiguations a native speaker was capable of making. In this way, it is likely that the distinguisher would retreat progressively "towards the horizon until it vanishes altogether". To illustrate his point, Bolinger took Katz and Fodor's entry for bachelor and drew up 13 disambiguating sentences:

(1) He became a bachelor (non-becoming).

(2) The seven-year-old bachelor sat on a rock (Adult).

(3) Lancelot was the unhappiest of all the bachelors after his wife died (Unmarried).

(4) That peasant is a happy bachelor (Noble).

(5) George is one bachelor who is his own boss (Dependent).

(6) George is a bachelor in the service of the Queen (Proximate).

(7) Knight banneret Gawain is a bachelor (Inferior).

(8) At some time in his life every man is a bachelor (Heirarchic).

(9) A bachelor is expected to fight (Military).

(10) He is studying hard to be a bachelor (Educand).

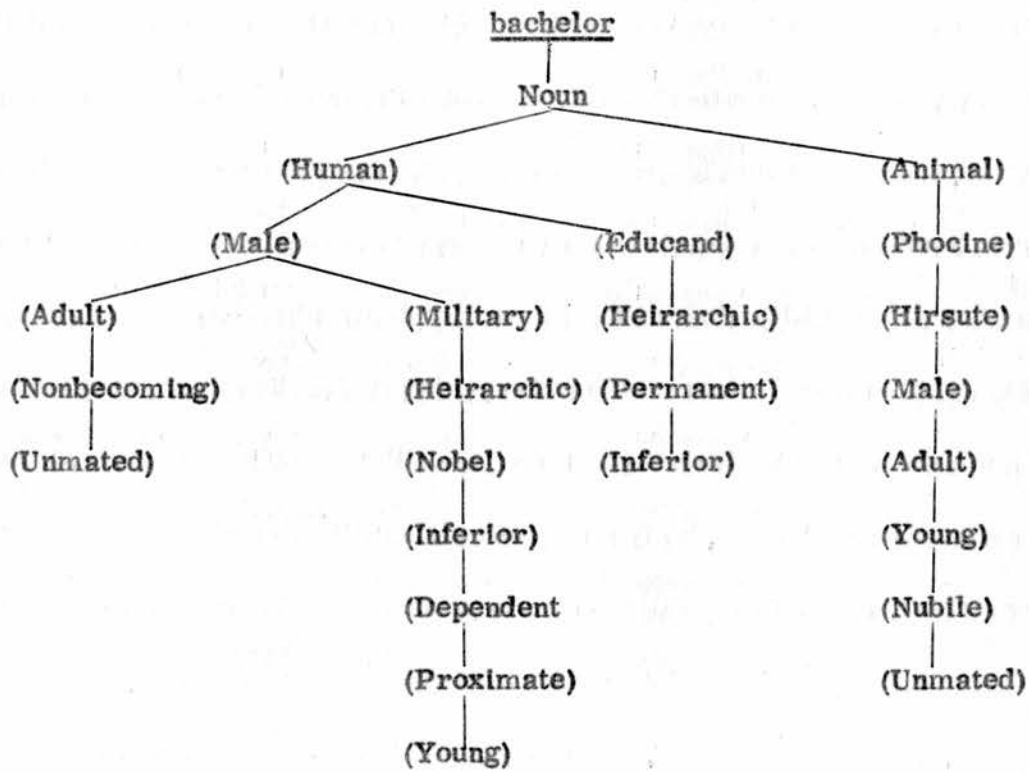
(11) Employers prefer married men who are at least bachelors; without the degree you hardly have a chance (Heirarchic).

(12) At the age of twenty-five he ceased to be a bachelor, but he never married (Permanent).

(13) That pet of mine is always nuzzling me and barking and wiggling his flippers (Phocine).

Converted /

Converted into a tree diagram, this reads:




So, at the expense of increasing considerably the number of markers, Bolinger has eliminated the various distinguishers. Another unsatisfactory aspect of distinguishers be observes is that they contain redundant elements. For example, when Katz and Fodor extract the marker (Young) from [young knight serving under the standard of another knight] the remaining distinguisher still contains [knight serving under the standard of another knight] which in turn could render the markers (Human) and (Male) both of which already exist on the path. But on theoretical grounds, Bolinger's chief criticism of the marker distinguisher dualism is that "it does not appear to correspond to any clear division in natural language".

While it may be argued that such a scheme accounts for the native speaker's ability to disambiguate sentences given to him, on what basis can it be said that the same scheme is adequate when it comes to identifying and rejecting anomalous sentences? Bolinger cites the sentences "He walked right

through /

through the bachelor" and "He broke the bachelor in two" which would be rejected by the native speaker of the language and would therefore have to be represented in the tree diagram by markers such as (Solid) and (Pliable) dominating (Human). If the theory were to account for the fluent speaker's ability to detect anomaly through the use of markers ('latent markers' to use Bolinger's term) then the number of markers that would have to be associated with each entry would be infinite. A dictionary of the sort recommended by Katz and Fodor, which in any event employs only one of the devices that an 'ordinary' dictionary does in providing information on the senses of words, would not be able to cope with the detection of anomaly of this sort even though it is more successful with disambiguation. This is hardly surprising since the number and kinds of ambiguity are parts of the data on which distinguishing senses is based, whereas the infinite set of potential anomalies can only be guessed at.

Another sense in which the ordinary dictionary may take account of the fluent speaker's ability to detect anomaly is its ability to indicate homonymous terms. In terms of the Katz and Fodor dictionary component, this would mean representing homonyms by two entries and not by two distinct paths of the same word.

But a more significant difference between the dictionary of traditional lexicography and that proposed by Katz and Fodor is that the former sets out to establish sense characterisation (including what Bolinger refers to as gradience) by the provision of synonyms. Katz and Fodor recognise this practice of the conventional dictionary but they regard it as 'a technique of cross reference' which compares the sense characterisations of lexical items with those of other items in the dictionary i.e. a comparison of existing sense characterisations as distinct /

distinct from the establishment of sense characterisation resulting from sense overlap. While even this may be accounted for to an extent by recognition of mutual markers there are aspects of gradience that cannot be satisfactorily so resolved. This leads Bolinger to conclude that the conventional dictionary practice of synonymic definition "seems not to be a kind of covert definition by markers but a definition by the semantic range of individual words. If this kind of definition is necessary, then there is a limit to the use of markers and Katz and Fodor have not met the challenge of synonymies by calling them 'redundant'."

But Bolinger is concerned too about the finite nature of dictionary entries. Where the conventional dictionary is by right "a frozen pantomime", a reflector of what is and what has been in the language, a dictionary of the sort proposed by Katz and Fodor must be equipped to account also for such 'creative' aspects of natural language as semantic shift and metaphor. The "indeterminacy in semantic interrelatedness" which he illustrates with the example of soup, leads Bolinger to observe that since in a marker system one is dealing with 'atoms' which do not have ranges and present either/or choices, it is very doubtful if one arsenal of categories will be adequate to account for meaning.

But if the lexicon is such that it is unlikely that this one line of attack proposed by Katz and Fodor is adequate, why does the entry they supply for bachelor meet with qualified approval from Bolinger? He draws a sharp distinction between a constructive definition and a substantive definition. Bachelor is of the former type because it applies to a social construct where the markers are given a priori in that respect, the markers found in bachelor are there because they have already been put in and entries of this sort can be dealt with more successfully by a marker system. A substantive definition will therefore refer to those objects which are not social constructs, 'the hard objects of the natural world'. In

contrast/

contrast to bachelor, an object of the natural world "is something we take as we find it, and the markers are adjusted like a suit of clothes, often badly. The fit is crude, metaphorical, subject to revision, and above all subject to change as the entity grows or decays through time".

But what are the markers that are to be found in constructive definitions or for that matter substantive definitions and how are they arrived at? The markers are part of the theory and fulfil the purpose of disambiguating sentences. But as Bolinger points out, disambiguation can take place as a result of the fluent speaker applying his "knowledge of the world" and while Katz and Fodor acknowledge this to be so, they take the view that the upper bound of the semantic theory must be placed in such a way that the role of the non-linguistic setting must be excluded. "The weak version (of the theory of setting selection) requires only that the theory interpret discourse just insofar as the interpretation is determined by grammatical and semantic relations which obtain within and among the sentences of the discourse i.e. it interprets discourses as would a fluent speaker afflicted with amnesia for non-linguistic facts but not with aphasia". This point is illustrated by Katz and Fodor with the sentences

(1) Our store sells alligator shoes. (2) Our store sells horse shoes.

The disambiguation of these sentences which renders the meaning of the first as "shoes made from alligator skins" and the second as "shoes made for horses" not "shoes made from horses hides" arises from our knowledge of the world and not from semantic markers. Bolinger, however, argues that a semantic marker (Shoe-wearing) is every bit as plausible as such markers as (Animal) (Physical Object) (Young) (Female) since the provenance of each of these is the same as (Shoe-wearing) viz. knowledge of the world.

Finally, Bolinger questions Katz and Fodor's concern with the morpheme as the atomic /

atomic element of form corresponding to the atom of content. The fluent speaker's knowledge of concatenations of morphemes that repeat themselves will mean that such a concatenation is familiar to him and as such will have a sense characterisation. Therefore horseshoe "as it is used by the fluent speaker of English is virtually as univocal as spree", and this would be an acceptable posture to adopt in respect of many more concatenations of morphemes which might be regarded as previously learned units. "A semantic theory adjusted to natural language must somehow reconcile the way in which human beings operate with wholes and at the same time with forms - morphemes - that they have managed to decontextualise from the wholes .... The assumption of the minimal lexical unit is the weakest point in the K - F theory".

(b) Uriel Weinreich

Like Bolinger, Weinreich took the view that in a number of ways the proposals of Katz and Fodor were unsatisfactory and as a prerequisite to the development and presentation of his own proposals, Weinreich offered an analysis of these inadequacies in Section 2 of 'Explorations in Semantic Theory' (1966).

As an initial observation, Weinreich noted that the Katz and Fodor Theory was less broad in its range than its authors claimed. The theory "cannot deal adequately with the content of readings of a sentence". In practice the theory is concerned with only a limited area of semantic competence, namely the detection of semantic anomalies and identification of the number of readings of a sentence.

But by treating the role of context and polysemy as they do, "Katz and Fodor conform to the trend of modern lexicology" and in assigning to this concept a central role commit two important mistakes. Firstly the differentiation of submeanings in a dictionary might be made "without limit"; secondly, as

Bendix observes, the disambiguation of potential ambiguities is essentially an aspect of Hearer performance. This is significant particularly for the theory which stresses the criterial differences between knowledge of a language (competence) and use of a language (performance). Consequently, the "preoccupation of Katz and Fodor with disambiguation appears to be an entirely unjustified diversion of effort".

In addition, Katz and Fodor's theory cannot take account of figurative expression or explain sentences that are meant to be ambiguous because the projection rules automatically select the fully grammatical interpretation for a sentence where there is one.

The form of presentation adopted by Katz and Fodor is open to question and improvement. Weinreich correctly observed that, apart from any question of the justification of particular syntactic features, the size and number of the traditional part-of-speech categories depended very much on the depth of syntactic subcategorisation. Accordingly, Katz add Fodor's "global" syntactic markers which in notational terms are not sufficiently revealing, could be more satisfactorily expressed in a feature notation with no consequent adjustment being necessary to the theory.

To illustrate the point, Weinreich takes as an example a category A that is subcategorised into B and C and offers the notation $A \rightarrow \begin{Bmatrix} B \\ C \end{Bmatrix}$ as a superficial means of expressing this. Such a notation could serve to illustrate the subcategorisation of Latin 'Declinable' into 'Noun' and 'Adjective'. But, as Weinreich points out, "The specific fact of subcategorisation" is not illustrated in this. It would be shown by the notation $A \rightarrow \begin{Bmatrix} A1 \\ A2 \end{Bmatrix}$ (where A1 = B and A2 = C) and the notation $A \rightarrow A + \begin{Bmatrix} [+F] \\ [-F] \end{Bmatrix}$ (where $[+F]$ and $[-F]$ stand for values of a variable feature which can differentiate the species B and C

of/

of the genus A. Weinreich's example is 'Nomen' subcategorised into 'Nomen substantivum' and 'Nomen adjectivum'. Single global syntactic markers would correspond to the notation $A \rightarrow \begin{Bmatrix} A \\ B \end{Bmatrix}$ and sequences of elementary markers to a feature notation of the type $A \rightarrow A + \begin{Bmatrix} +F \\ -F \end{Bmatrix}$. In the light of this, Weinreich suggests that a syntactic marker would be better seen as a sequence of symbols, the first of which is a category symbol and the others feature symbols. Nonetheless, although this notation represents an improvement in that it enables a dictionary entry to be expressed as a branching sequence in the form of category symbol + feature symbols, it remains unsatisfactory. Weinreich demonstrates that such a notation is unable to distinguish between "fortuitous homonymy and lexicologically interesting polysemy" for example -

**rock** → Noun → Count → non Animate → ... (='stone')
**rock** → Verb → ... (= 'move undulatingly')

This problem might be partially solved by insisting that such conflated entries with branching of syntactic markers be restricted to cases where the dictionary can show the meanings of the entries are related and that there is therefore a reconvergence of paths at a certain semantic marker such as

**adolescent** → Noun / Adjective → **(Human) (non Adult) (non Child)**

But Weinreich takes up a more substantial point when he examines the question of the distinction made by Katz and Fodor between semantic markers and syntactic markers and concludes that the distinction is illfounded and that Katz and Fodor's argument is a "disguised circularity".

This, he states is the inevitable conclusion of comparing both types of marker in terms of the functions they perform. According to Katz and Fodor, the semantic markers of words are those elements of the meaning of a word to which /

which the projection rules are applied, resulting in the production of sentences which the native speaker recognises as unambiguous, anomalous or ambiguous in certain defined ways. A semantic marker will not appear in the path of any dictionary entry unless it has a counterpart in the selection restrictions of at least one other dictionary entry.

But Weinreich demonstrates that in functional terms, syntactic and semantic markers (features) are the same so far as preventing the generation of anomalous of ambiguous sentences is concerned.

In the sentences (1) I observed the ball

(2) I attended the $ball_2$

(3) I burned the $ball_1$

(where $ball_1$ = "gala affair"; $ball_2$ = 'spherical object'), the theory could not explain the ambiguity of (1) or mark the anomaly of (2) and (3) until semantic markers such as (Event) and (Object) are added as subcategorisation features. But this is precisely the same process that would occur in syntax to prevent the generation of ill-formed expressions or ambiguous sentences: e.g.

$S \longrightarrow NP + VP$

$VP \longrightarrow V + (NP)$

$NP \longrightarrow$ Tom, Bill

$V \longrightarrow$ liked, waited

To prevent the generation of such sentences as *Tom waited Bill, *Tom liked, subcategorisation of VP must be undertaken:

$$VP \longrightarrow \begin{cases} Vt + NP \\ Vi \end{cases}$$

$Vt \longrightarrow$ liked,

$Vi \longrightarrow$ waited

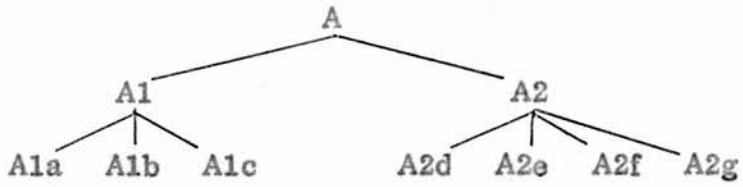
This /

This addition of syntactic features (or markers) "corresponds in form and motivation to the addition of (Event) and (Object) in preventing (= marking as anomolous) such expressions as sentence 3 = 'I burned the gala affair'.

The counterpart of the introduction of markers to exhibit the ambiguity of (1) "I observed the ball" is demonstrated by Weinreich in the sentence "This substance is fat". If an English grammar allowed VPs consiting of Copula + Nomen, this sentence would remain ambiguous until Nomen was subcategorised into Noun and Adjective.

So, such distinction as there may be between syntactic and semantic markers remains unresolved on the basis of function. The only remaining basis for distinction would be that semantic markers have some denotative content in contrast to syntactic markers but this would require recourse to data which Katz and Fodor have specifically indicated is outwith the scope of the theory. Like Bolinger, Weinreich is unconvinced by Katz and Fodor's componential analysis of the meaning of lexical items into the two distinct types of elements, markers and distinguishers. "The whole notion of distinguisher appears to stand on precarious ground when one reflects that there is no motivated way for the describer of a language to decide whether a certain sequence of markers should be followed by a distinguisher or not". Weinreich does not deal with the possibility of the distinguisher not being preceded by any markers at all. A stronger criticism would be to show that the distinguisher might be so expanded that the markers disappear: then it would be quite arbitrary as to whether markers only remained or distinguishers only. Since distinguishers do not enter into theoretical relations according to Katz and Fodor and since they cannot correspond to features of denotata since these do not come within the scope of the theory at all Weinreich observes that it is difficult to see exactly what/

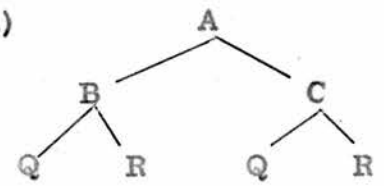
what role they enact. It would seem that Katz and Fodor are suggesting that they might be the unique ultimate elements in a taxonomy such as



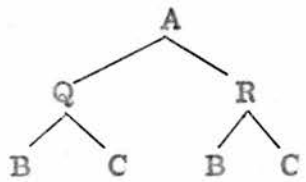

but the lowest level features (a, b, c, d, e, f, g) do enter into theoretical relations in that they alone distinguish the relationship existing amongst the elements of each of the superordinates A1 and A2. Both Bolinger and Weinreich make the point that the only clear evidence on which to decide at which point a marker would be followed by a distinguisher and not another marker would seem to be a dictionary definition which is guaranteed to be correct and this again begs the question.

The semantic markers of a dictionary entry are normally conceived of as features in a paradigmatic tree and as Weinreich states there is no apriori order for the markers. This is to some extent obscured, he argues, by Katz and Fodor's choice of dictionary entries which are representable by pure taxonomies. "Many dictionary entries tend to the form of matrixes of features, as in (1) and there is no motivated reason to rewrite them as (2): " .....

(1)




(2)




That is to say, there is no theoretical motivation for specifying the order of features in a path.

But this has considerable importance when it comes to examining the result of the operation of the projection rules on conjoining paths. Since the elements of a single path are unordered sets, when two paths are amalgamated, the result is the/

is the amalgamation of two sets of unordered features. Consequently there is no way of indicating "that in the path of Wa + Wb, am (for example) precedes b1".

The practical consequences of this lack in the theory is that Katz and Fodor are unable to represent the distinction between such expressions 'woman detective' and 'detective woman'. While this is serious it is less so than a recognition of the same problem in such sentences as

(1) Cats chase mice, and

(2) Mice chase cats

which would both receive identical readings because the paths of 'cats' + 'chase' + 'mice', although amalgamated in the order cats + (chase + mice) or mice + (chase + cats), would lead to the production of the same unordered set of features appropriate to {chase, cats, mice} as the amalgamated path. The meaning of a single word is expressed as an unordered, unstructured set of features and since there is no part of the theory to distinguish between meaning of simple and complex meaning structures, consequently phrases and sentences are operated on in the same way as the meaning of a siggle word with the result that the meaning of a complex expression is rendered as an unstructured collection of features. "The projection rules as formulated in KF destroy the semantic structure and reduce the words of a sentence to a heap".

Weinreich finally observes that a possible response to this situation could be that while it might be agreed that the semantic features in 'cats chase mice' and 'mice chase cats' are the same, the grammar is nonetheless different. This is undoubtedly true, but the problem is to establish how this difference in grammar is related to the difference in total meaning because nowhere is it dealt with in the theory.

## 3 The Appeal to Logic

### (a) E Bendix

A significantly different approach to componential analysis is represented by the work of Edward Bendix. His approach is nonetheless componential in the same sense as that of the anthropologists and he makes a point of emphasising this. "The meanings of the items in a language are presented as standing in opposition to one another within the system of the language and as being distinguished by discrete semantic components acting as the distinctive features". (Bendix 1971) However, these components are arrived at as a result of the application of some of the methods of symbolic logic to the analysis of sentences. The process is 'empirical' in that Bendix employs eliciting techniques and test sentences on informants which have as their objective the isolation of those semantic components that make up the paradigmatic meanings of items in a language. Bendix describes this as a "minimal definition".

The semantic structure of the language is not isomorphic with the formal structure of the language in Bendix's treatment, and morphemic questions involving homonymy and polysemy present none of the problems that we saw Katz and Fodor attempt to solve. His generative semantic theory would include metalanguage symbols for components and in any one case the appropriate semantic symbols would be combined and would ultimately be rewritten in an appropriate form in the object-language. In the dictionary, each definition would be a separate entry and two different definitions that share some semantic components may or may not be represented by identical forms but their relation to each other in the semantic system would remain the same.

Unlike the cultural anthropologists who took a more cautious view of the possibility of inferring intercultural universal components, Bendix sees the gradual revelation of a stock of metalinguistic features of meaning "much as the stock of phonetic features" which would be variously combined as components in the definitions of items in different languages, with supplementation by certain language specific components. Justification for this view rests mainly on "the prima facie intertranslatability of languages to a significant degree".

Bendix illustrates the method of analysis with the sentence 'John has a dog'. (While drawing on symbolic logic for the analysis, his notation is not in accordance in all respects with the conventions to be found in logic). This may be analysed into the existential quantifier and functions: 'there is a B' (where A and B are variables) and 'A has B' and 'A = John' and 'B is a dog'. 'Dog' is in fact a one-place function and its representation in a description of English as a lexical item would not be as one word but as 'B is a dog'. This is significant for Bendix in that the difference in number between one-, two-, three-place functions correlates with differences in syntactic behaviour and "such a representation of lexical items as schematic sentences shows the syntactic differences and facilitates the application of appropriate rules to generate utterances". So the "unit form" to be defined in the dictionary is the lexeme as a function and the semantic components are also in the form of functions (or schematic sentences).

Bendix employs certain 'primitives' in arriving at his components: "at in at time T points to an undivided ... time and time or T and before are also primitives used in defining immediately before". Immediately

before is required in defining a component of change of state or activity. Another primitive is P causes Q.

Examples of Bendix's components follow, expressed in the specially adapted notation

(1) A an-F (where an is the existential quantifier and AF symbolises a function with a variable A).

(2) B is an-Rh A (where R stands for a relation between B and A of a particular type and R is a 'have'-state type of relation).

(3) B is A's.

An approximate reading for each in the object language would be

(1) 'A is or does something'

(2) 'There is a 'have'-state relation between B and A', or 'A has B'

(3) 'B belongs to A'.

In such components, is vs does represent state vs activity. The label '(C an-F) causes (B is an-RhA)' is used when tests suggest the existence of the component state vs activity and that this state or activity is connected causally with another state or action as in C gives B to A. Various eliciting techniques and test sentences are described by Bendix which aim to isolate these semantic components. The components themselves are not conceptual markers of the Katz-Fodor type but are functions or schematic sentences. The results of the semantic eliciting techniques and tests are such that they can be integrated into a transformational semantic grammar which will generate surface structures from these underlying functions or sentences. Bendix goes further and claims that a metatheory would include a stock of such semantic components which could be combined to define and generate many of the underlying functions in the

description of a particular language. In the discussion he indicated that one such component was be/have, expressing a state or state relation.

(b) Manfred Bierwisch

Like Bendix, Bierwisch presupposes the general framework of transformational generative grammar in delineating what in his view are the formal aspects of semantic representation. Like Bendix, he too looks to certain aspects of symbolic logic for not only notational and terminological assistance but insights into the nature of semantic processes. While he is not concerned to the same degree as Bendix with empirical testing with a view to gathering behavioural data, he is nonetheless just as concerned with the possibility that the semantic features he is discussing may be universal and that "all semantic structures might finally be reduced to components representing the basic dispositions of the cognitive and perceptual structure of the human organism".

In Bierwisch's view, the semantic analysis of natural languages depends very largely on the assumptions that "the meaning of dictionary entries are not unanalyzable wholes but can be decomposed into elementary components" (1970) and that the meaning of sentences can be arrived at on the basis of these dictionary entries and the syntactic relations connecting them. These components are not dissimilar in some respects to Katz's semantic markers (Bierwisch rejects the marker/distinguisher distinction as unmotivated) and they may be classified into several subtypes "constituting ultimately a highly structured system of underlying elements".

In the terms of modern logic, Bierwisch sees semantic features as essentially predicate constants and therefore more than the concatenation of features proposed by Katz and Fodor. By regarding semantic features as predicates it is possible to "reconstruct the more complicated

connections among them by using the formal means of the fully fledged predicate calculus". In addition, if they are to be regarded as predicates, semantic features have to be assigned to suitable arguments and accordingly these arguments will be part of the semantic representation. These will be variables "substituted by representations of the referents which are talked about by means of particular occurrences of the expressions to whose readings the variables belong. From this it follows that dictionary entries also must contain appropriate variables which are to be substituted by more specific variables if they occur in particular sentences". These variables would be indexed with respect to the syntactic relations in question and would indicate identity of reference:

James$_1$ phoned James$_2$ vs *James$_1$ phoned himself$_2$

*James$_1$ phoned James$_1$ vs James$_1$ phoned himself$_1$

Accordingly, in Bierwisch's view, for every NPi there is a variable Xi which functions as an argument in the semantic representation of the expression of which the NPi is a part and also is substituted for variables in the readings of other constituents to which the NPi bears the appropriate syntactic relations. Thus two noun phrases with identical indices refer to the same set of objects and those with different indices refer to different objects. In the sentence

When they$_1$ arrived, the king$_2$ welcomed the generals$_1$

the pronoun they is coreferential with the generals. The semantic interpretation of a deep structure is then derived by (1) interrelation of the semantic components by means of appropriate arguments and (2) connecting the meanings of the individual words by logical constants. Thus an argument Xs of a verb or an adjective or a predicate noun is

replaced by Xi if i is the referential index of the subject noun phrase. Likewise, an argument Xd is replaced by Xj if j is the referential index of the direct object, and so on.

The semantic features fall into different classes according to the number of arguments required (i.e. one-place predicates representing properties, two-place predicates representing relations) and according to the different types of argument encountered. Bierwisch also distinguishes between predicative features and delimiting features on the basis that the former specify the conditions to be met by the objects of the set referred to, while the latter do not apply to these objects as such but to the set as a whole with the function of specifying its size or its role in discourse. The delimiting features may be compared with certain operators in modern logic and the problems associated with definiteness, quantification and accordingly they have a status quite different from predicative features.

One of the means by which predicative features are to be classified is the number of their arguments and this provokes the question as to how many such arguments would mark the upper limit of such a classification. In any event, the number of arguments of a predicative feature must be somehow connected to the number of NPs required by the lexical entry in which the reading of that feature exists. Although the verb gave, for example, in the following sentence expresses a three-place relation

[Mary] NP1 gave [Jim] NP2 [a penny] NP3

it was suggested by Bendix in the previous section that give may be analysed into two-place relations. Bierwisch accepts this analysis and expresses it in the more simple form

C causes (A has B)

where C represents the referent of the subject - NP, B that of the direct object and A that of the indirect object. This enables Bierwisch to rewrite as

[Cause] Xs ( [Have] XI XD)

where Xs, XD and XI represent variables of a dictionary reading to be substituted by the Xi of the subject, direct object and indirect object respectively.

Similarly, sell which may express relations with as many as four arguments.

[Mary] NP1 sold ( [Jim] NP2) [an article] NP3 (for [a penny] NP4)

may be analysed into combinations of two-place features. This leads Bierwisch to the hypothesis that in general only one- or two-place relations are required.

But C causes (A has B) has the form C cause P, where P is not a single argument but a whole proposition made up from a semantic component with its arguments. Although 'Caus' and 'Have' are both two-place relations, they belong to different feature types. To illustrate this difference, Bierwisch gives two sentences

[John] NP1 regrets [that Paul was waiting] NP2

[John] NP2 believes [that Paul was waiting] NP2

The reading of regret and believe contain relational features which represent a certain bearing of the first argument in each sentence (the XI provided by the NP1 'John') on the second argument. The features 'Believe' and'Regret' (like 'Caus') both take a proposition as

their second argument but the bearing on (or "attitude to") the propositions of the first arguments is different in each case. The attitude represented by 'Regret' is towards a fact represented by the proposition in question; the attitude represented by 'Believe' on the other hand is that the index of the first argument is inclined to take the second argument as a true proposition i.e. the attitude is to the proposition itself. Clearly 'Regret' stands with 'Caus' in type because with each it is not the proposition itself but the fact described by its argument proposition which is brought about by the first argument of each. Bierwisch labels this type 'fact-features' (F- features) and the other represented by 'Believe' 'proposition-features' (P - features). This distinction of type is important in dealing with the problems of negation and 'opaque contexts' as he demonstrates:

John does not believe that Paul was waiting
John believes that Paul was not waiting

These sentences are synonymous but the negations

John does not regret that Paul was waiting
John regrets that Paul was not waiting

clearly are not. So far as opaque contexts are concerned, these can be constituted by P-features only.

Relational features occur not only in verbs but also in the readings of relational nouns such as <u>father</u>, <u>friend</u>, <u>side</u> and others expressing the part-whole-relation. This is illustrated along with other features representing properties for <u>father</u>

father: X Parent of Y and Male X.

In addition to this, a redundancy rule which expresses that the elements

related by 'Parent of' are animate and that the first member is also adult gives the formula

X Parent of Y $\rightarrow$ ⟨Animate X and Animate Y and Adult X⟩

Accordingly, father may be expanded as

X Parent of Y and Male X and ⟨Animate X and Animate Y and Adult X⟩

A further classification of semantic features can be adduced in respect of relative adjectives such as 'heavy', 'old', 'big', etc. These adjectives specify a certain parameter and indicate that the object referred to exceeds or falls short of a certain point within that parameter. This is readily seen in an explicitly comparative construction such as 'Mary has a bigger sum of money than Jim'. But, in the example that Bierwisch himself gives: 'The table is high' it may not be readily recognised that a comparative is implicit. Sapir has pointed out this special case of the comparative which is readily seen in an expanded version of the sentence: 'The table is higher than a certain norm'. The norm is intimately related to the class of objects to which the subject of high belongs. This relationship is not a direct one to the objects themselves but more specifically to particular properties of the objects. To that extent Bierwisch notes that these properties are treated as a kind of 'parasitic or subsidiary argument' and must be established by a further type of relational feature "extracting extensions (or other parameters) from the primary arguments".

A paraphrase of 'This table is high' might therefore be given as 'This X is a table and Y is the height of X and Y is greater than the normal value of Y' where the 'normal value of Y' may be characterised 'Z': Y 'Height of' X and Y 'Greater" Z. The converse relation 'smaller'

will characterise the antonyms. The component 'Y Height of X' is further analysed into the general relation 'Y Dimension of X' and additional characteristics of the three independent spatial dimensions. These features specifying dimensions must agree in a definite way with the corresponding dimensional features of the nouns modified by the particular adjectives and function like selection restrictions:

long: Y Greater N and ⟨Y Dimension of X and Maximal Y⟩

high: Y Greater N and ⟨Y Dimensions of X and Vertical Y⟩

The feature 'Maximal' might be further reduced to the already given relation feature 'Greater' by definition.

Maximal Y = by def. there is no Z such that Z Greater Y. Before leaving his treatment of relative adjectives, Bierwisch observes that what has been said of spatial extensions could be readily extended to other parameters as well, notably that of time. "The variables representing time intervals are thus subsidiary arguments of the same kind as the variables over space intervals".

So, for Bierwisch, adequate semantic representation requires (1) a set of variables (in readings of sentences, indexed as to identity or difference of reference) representing sets of objects to which linguistic expressions can refer and (2) a set of semantic features or components which are classified according to several aspects into delimiting features and predicative features. The latter represent properties and relations of the elements of the sets represented by the variables and are further classified on the basis of the number of their arguments into one- or two-place predicates. Further subclassification might relate to the type of arguments the features take such as true objects, facts, propositions,

subsidiary (parasitic) objects or dimensions of objects. These predicative semantic features correspond to predicate constants and the delimiting features to quantifiers and certain other logical operators.

A third requirement for satisfactory semantic representation is of course a set of rules, a syntax, for combining the elements of the other two categories according to the constraints of the semantic features.

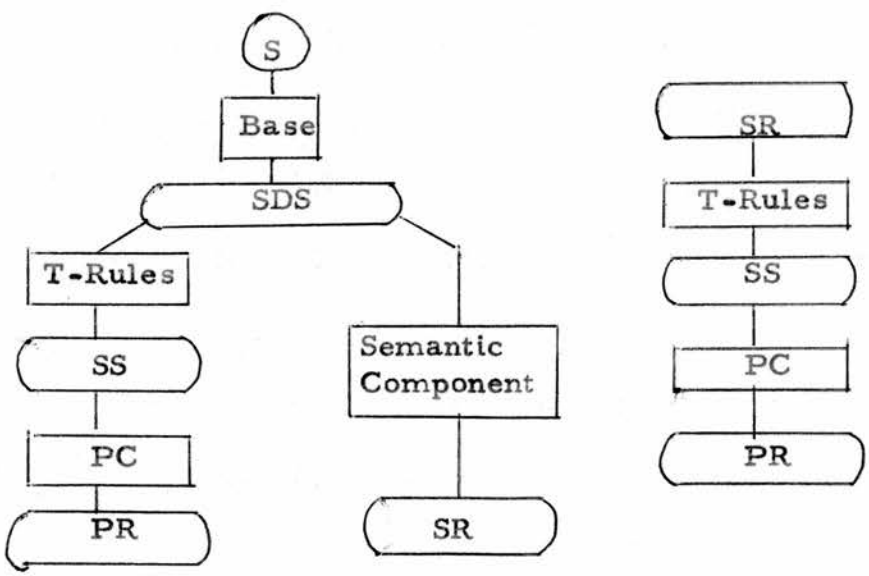
However, Bierwisch points out that the formal classification of semantic features discussed is not the only structure organising the set of primitive semantic terms. "A fairly complex system of mutual inclusion, exclusion, hierarchical subordination etc. must be assumed to govern this basic inventory".

(c) James D McCawley

In the previous section, Bierwisch argued that semantic representation presupposed at least a set of variables representing sets of objects to which linguistic expressions would refer, a set of semantic features classified under several aspects and a set of rules or conventions to form semantic representations. The third of these requirements about which he has little to say is very much the concern of McCawley and a number of other linguists (including Lakoff, Ross) and it lies at the heart of the Interpretative v Generative controversy in semantics. The difference between these approaches has been described by Seuren in perhaps a more revealing way as a distinction between 'autonomous syntax' and 'semantic syntax'. Proponents of the latter "consider lexical description in terms of features unsatisfactory for a number of reasons ..... items call for definitions in the form of syntactic trees, with hierarchies of labelled constituents, not unordered sets of features". (Seuren, 1974) Rejection of those 'features' of the sort that Katz's name has been most prominently associated with does not mean that the generative/ syntactic semanticists are not concerned with semantic primitives. On the contrary, the nature of these primitives and the role they play lie at the centre of the controversy and lead to a fundamental questioning of Chomsky's 'Aspects' model, particularly the role of syntactic deep structure. The view is expressed that the well-formedness of sentences cannot be determined solely on formal or syntactic grounds and that the syntactic and semantic information necessary for this determination cannot be separated. According to de Rijk, generative semantics "does

not recognise the existence of a level of deep structure, from which semantic representations are obtained by the application of Katz-and-Fodor-type projection rules on the one hand, and syntactic surface structures by the application of a system of syntactic transformations on the other. .... Generative Semantics stands in contrast not only to 'Interpretative Semantics' where the whole task of semantics is taken to consist in interpreting independently generated syntactic structures, but also to 'Generative Syntax' in which the generative partsof the grammar ..... are thought of as generating purely syntactic entities ... In Generative Semantics the phrase-structure rules ... generate semantic representations, that is, expressions which are intended to formalise the full semantic content of the sentence .... Semantic facts can be, and ought to be accounted for in just the same way, using the same devices, as syntactic facts are". (de Rijk, 1974).

The difference between Chomsky's position (as represented by the Extended Standard Theory) and that of the advocates of semantic syntax is illustrated by Seuren (1972):



In his paper 'The Role of Semantics in a Grammar' (1968) McCawley accepts critically the 'Aspects''position for most of the paper but in the light of further consideration in a Postscript, he rejects the notion of deep structure as distinct from semantic reading. He notes with dissatisfaction the role played by syntactic selectional features and argues for semantic selectional features of the type proposed by Katz and Fodor on the basis that "one must look at a representation of an entire constituent rather than its 'head' lexical item to determine whether it meets or violates a given selection restriction". (1968) He concludes that selectional restrictions are definable solely in terms of properties of semantic representations and that it is necessary only to examine semantic representation and nothing else to decide whether a constituent meets or violates a selectional restriction.

McCawley also examines the notion of 'intended referent' and 'index' as employed by Chomsky in a formal description of syntax. In the sentences

'A man killed a man' and 'A man killed himself'

(where the first sentence relates to two different people), the base component of the grammar would supply each noun phrase with an index which marks its intended referent and therefore the syntactic difference of the deep structures would be marked by difference and identity of indices respectively. But as McCawley observes, the two sentences differ also in meaning and consequently this difference in index will have to be part of their semantic representation as well. To this end, he makes what he calls an "obvious proposal" that the semantic representation of sentences should involve the predicates of symbolic logic rather

than the feature-like markers found in the theory of Katz and Fodor; man for example would be represented by an expression such as 'human (X) $\wedge$ male (X) $\wedge$ adult (X)' where X is a variable rather than by a set of markers (human, male, adult). The semantic projection rule which assigns a reading to a noun phrase containing that lexical item would substitute the index of the noun phrase for that variable. McCawley distinguishes between the 'intended referent' of a noun phrase and the 'actual referent' so far as indices are concerned; indices will not correspond to 'real things in the universe' but to 'items in the speaker's mental picture of the universe'. This is obviously important if the theory is to take account of a speaker's sentences that are concerned with imaginary objects or are factually mistaken. Therefore, "one could perfectly well say that the index does not represent the intended referent but indeed is the intended referent ..... Thus indices are non-linguistic units which happen to play a role in linguistic representations". (1968)

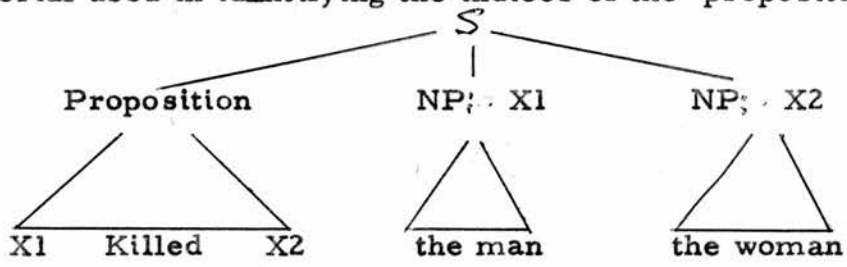
Close examination of what he refers to as the 'respectively transformation' provides McCawley with the first major point in his Postscript, namely that "the class of representations which function as input ... involves not merely set indices but also quantifiers and thus consists of what one would normally be more inclined to call semantic representations than syntactic representations". He goes on to suggest that there is no reason why a grammar could not consist of a 'formation-rule component' consisting of rules correlating semantic representations with surface syntactic representations "in much the same fashion in which Chomsky's 'transformational component' correlates deep structures with surface

syntactic representations". But would this mean that two significantly different sets of rules would be required for semantic and syntactic operations? McCawley draws attention to Lakoff's observation that "there is an almost exact correspondence between the more basic syntactic categories and the primitive terms of symbolic logic and between the rules ..... proposed as a base component universals and the formation rules for symbolic logic which various authors have proposed" (McCawley, 1968). Semantic representations (involving the predicates of symbolic logic) can be represented by trees because they involve constituents which are grouped together by parenthesis and since "the categories of the operations and operands which appear in symbolic logic .... correspond to syntactic categories, semantic representations can be regarded as trees labelled with syntactic category symbols".(ibid) So, the brunt of McCawley's argument is that these considerations indicate that there is no justification for positing a 'natural breaking point' such as the level of deep structure between a syntactic component and a semantic component of a grammar. The setting up of such a level makes it impossible to describe processes such as the use of'respective/ respectively' as a single rule and they have to be accounted for in terms of special cases, some of which will correspond to rules of semantic interpretation and others to transformations.

But McCawley finds that existing versions of symbolic logic are insufficient for the representation of meaning in certain respects. In his paper 'Where do noun phrases come from?' (1971) he notes that the conjunction

Kill y (X1, X2) $\wedge$ Past (y) $\wedge$ Man (X1) $\wedge$ Woman (X2)

does not correctly represent "The man killed the woman" and that the meaning of the expressions the man and the woman play in some sense a subordinate role in the meaning of the sentence. Drawing on the comments made earlier about 'intended referents', McCawley emphasises his point that indices are conceptual entities in the minds of speakers and communication is possible between individuals (1) in so far as their mental pictures agree and (2) because "the noun phrases which speakers use fulfil a function comparable to that of postulates and definitions in mathematics" (ibid) (in other words, they indicate properties which the speaker thinks belong to the conceptual entities under discussion and have the task of supplying the listener with enough information to pin-point the entities the speaker is referring to). Consequently, McCawley can say that "it is necessary for semantic representation to separate a clause into a 'proposition' and a set of noun phrases which provide the material used in identifying the indices of the 'proposition'" (ibid):-

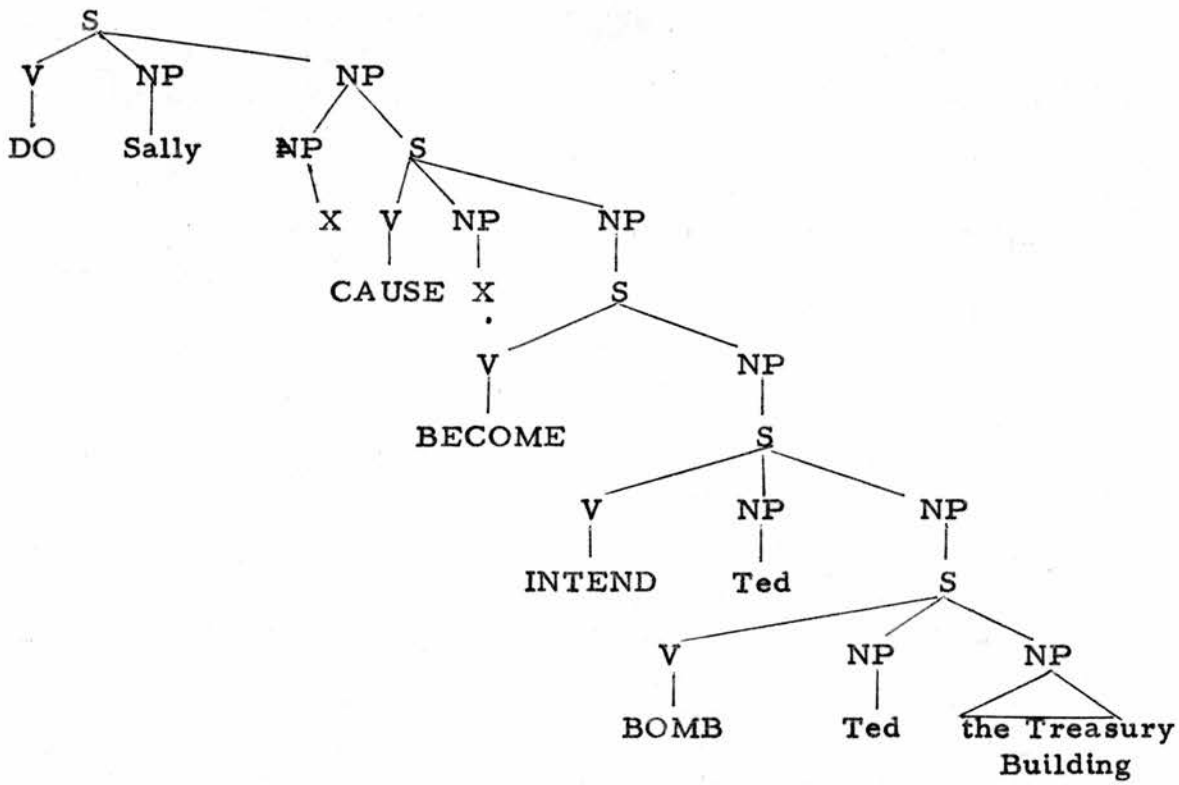



Although McCawley has made no reference to components of meaning as such - indeed, his disavowal of 'semantic features' is explicit - his 'features' can be seen to involve some of the aspects of analysis given by Bendix and Bierwisch. In his paper 'Prelexical Syntax' (1971) it is perhaps easier to recognise this correspondence and identify what for him are the basic semantic elements. He states quite specifically that "the ultimate units of a semantic structure will not be morphemes but rather some kind of semantic units". Unlike lexical items whose

content are bundles of feature specifications, McCawley's semantic units "need not be all together in semantic structure". He illustrates this using the sentence:

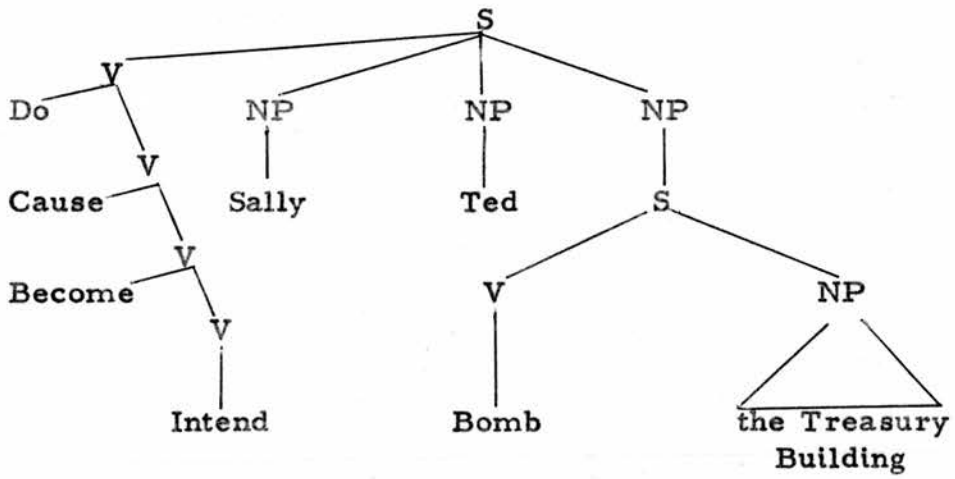
Sally persuaded Ted to bomb the Treasury Building.

He suggests that persuade contributes notions of 'doing', 'causing', and 'intending' to the content of the sentence. "The elements of content to which I have been referring are not features of the sentence but are relations between items of content that figure in the sentence, and to specify the semantic structure of a sentence, it is necessary to not merely indicate which of such elements are present but also indicate what items those relations relate". He expresses this as a tree diagram:




The elements of meaning encoded in 'persuade' are 'Do', 'Cause', 'Become' and 'Intend', each of which is the main predicate of the complement of the preceding one. By a rule which McCawley calls Predicate Raising, the stages in a derivation allow the predicate of a

clause to be adjoined to the predicate of the next higher clause in a series of steps that leads from semantic structure to surface structure. Applied to the tree diagram above, application of this rule would result in a constituent 'Do Cause Become Intend' which corresponds to the verb persuade.




"It remains to be seen that all combining of elements of meaning into lexical items can be reduced to the interaction of a limited number of transformations of the types which are normally recognised (permutation, copying, adjunction, deletion, insertion)".

(d) Charles J Fillmore

"If it is possible to discover a semantically justified universal syntactic theory along the lines I have been suggesting, if it is possible by rules ..... to make these 'semantic deep structures' into the surface forms of sentences, then it is likely that the syntactic deep structure of the type that has been made familiar from the work of Chomsky and his students is going to go the way of the phoneme". So Fillmore ended his paper 'The Case for Case' (1968) in which he defined his use of the term 'case' to identify the underlying syntactic-semantic relationship as distinct from 'caseform' by which he meant the means whereby a case relationship is expressed in a particular language "Whether through affixation, suppletion, use of clitic particles, or constraints on word order". He argues that as a syntactic universal, this notion of 'case' deserved a place in the base component of the grammar of every language. It is important to recognise that in the traditional concepts of subject and predicate of a sentence there is no 'semantically constant value' attachable to 'subject' and that there are no semantically relevant relations in the surface subject which are not expressed 'by labelled relations'. Fillmore concludes that since all semantically relevant syntactic relations between NPs and the structures which contain them must be of this 'labelled' type this must mean "(a) the elimination of the category VP and (b) the addition to some grammars of a rule or system of rules, for creating 'subjects' (which will be seen as surface-structure phenomena).

Fillmore takes the basic structure of the sentence to be the verb and one or more noun phrase, each noun phrase being associated with the verb

in a particular case relationship. In this basic structure are a "Proposition, a tenseless set of relationships involving verbs and nouns ..... separated from what might be called the 'modality' constituent". Thus Sentence → Modality + Proposition where Proposition (P) is a verb and one or more case categories: each of the case categories is provided by a later rule with the categorial realisation as NP. So

$P \longrightarrow V + C_1 + \ldots . Cn.$

Fillmore provides a list of cases, which he points out is not exhaustive, and argues that these cases "comprise a set of universal, presumably innate, concepts which identify certain types of judgments human beings are capable of making about the events that are going on around them ...":- Agentive (A), Instrumental (I), Dative (D), Factitive (F), Locative (L), Objective (O). In a later publication (Fillmore 1971), he amends some of these labels and replaces others to give the list Agent (A), Counter-Agent (C), Object (O), Result (R), Instrument (I), Source (S), Goal (G), Experiencer (E). Verbs are selected according to the case engironments the sentence provides and this is referred to as the 'case frame'. Each noun has a label identifying the case relation it holds with the rest of the sentence and in the lexical entries for verbs, 'frame features' will indicate the set of case frames into which the given verbs may be inserted. Fillmore gives an example of the frame feature for the verb 'open' -

$+ [\_\_\_\_\_ \; O \quad (I) \quad (A)]$

Thus verbs are subclassified in respect of the case environments which can accept them; their semantic characterisations relate them to

specific case elements or to those elements which contain features (eg + animate) which have been introduced as obligatory accompaniments of particular cases.

In a later article ('Types of lexical information' 1971), Fillmore offers some examples of lexical entries from which "some suggestions can be gleaned for the design of canonical representations in a lexicon". To do so, he starts with the assumption that the semantic description of lexical items may be expressed as complex statements concerning "properties of, changes in, or relations between entities of the following two sorts: (a) the entities that can serve as arguments in the predicate-argument constructions in which the given lexical item can figure, and (b) various aspects of the speech act itself".

So far as the speech act is concerned, Fillmore draws on some of the distinctions made by Austin to mark the difference between 'locutionary verbs' and 'performatives'. He notes that the production of a linguistic utterance involves a speaker ('the locutionary source LS'), an addressee ('the locutionary target' LT) and a message which occurs within a specific time-span ('time of the locutionary act TLA') and in a particular situation ('the place of the locutionary source PLS' and 'the place of the locutionary target PLT'). The distinction between locutionary verbs (i.e. verbs such as say which can refer to instances of speech acts other than the one being performed) and the others is because it is necessary in the description to be able to distinguish speech acts as such from speech acts described or referred to in the sentence i.e. a distinction between the LS and the agent of a locutionary verb. So that in a semantic description of lexical items, a distinction is to be drawn between properties of the 'higher' clauses that contain them (deep structure constraints) and to features

of or participants in the speech act itself.

While some of the components of the sense of a word may be unique to that word, Fillmore takes the view that many of these components are common to large classes of words and that the "ultimate terms of a semantic description ..." are "such presumably biologically given notions as identity, time, space, body, movement, territory, life, fear etc. as well as undefined terms that directly identify aspects of or objects in the cultural and physical universe in which human beings live". In relation to 'time', he examines certain classes of verb which refer to 'momentary' states and others which he describes as 'continuative' e.g. wake up and sleep respectively. Other semantic properties can be noted so far as 'space' and 'movement' are concerned and verbs in the latter category can be described by associating them with properties relating to "direction, speed, gravity, surface etc.". Other features relate to "achievement verbs" and verbs which have the property of indicating the intentional or non-intentional involvement of one of the participants in the action of the verb.

The lexicon will also characterise words in terms of their use as predicates and as such they will be described in terms of the number of conceptual 'arguments' they take (as distinct from the number of arguments that must be explicitly identified in surface structure). The 'roles' that these arguments play are the case relationships which Fillmore examined in some detail in 'The Case for Case' and the combination of cases that might be associated with a given predicate is the case structure of that predicate.

The lexicon must also make accessible for each lexical item the

"happiness conditions" that must be satisfied for the item to be used aptly. Fillmore is referring to the presuppositional aspect of the semantic structure of a predicate as something different from the 'meaning' proper. For example, the sentence 'Please open the door' presupposes that the LT knows which door is meant and at TLA the door is not open. He notes that when the sentence is negated, although the 'meaning' of the command is changed, the 'happiness conditions' remain the same and this provides him with justification for his distinction between meaning and presupposition in this and other cases. The concept of presupposition, Fillmore points out, is what Chomsky has referred as 'selection' and it is seen as "more relevant to semantic interpretation than to lexical insertion". Furthermore, since Fillmore's view is that content words may all be inserted as predicates and that their realisations as nouns, verbs or adjectives is a matter of the application of rules, he points out that part-of-speech classification is not a type of information relevant to the lexical insertion into deep structures. What Fillmore has dealt with as the number of arguments a predicate takes and their case structure, correspond to Chomsky's 'strict subcategorisation'.

The following tentative suggestions for the lexical entries for a sense of blame and accuse are given by Fillmore. The feature pair ± locutionary indicates whether the verb does or does not refer to a linguistic act; + Performative indicates those verbs which can be used in first person, simple-present utterances in the performance of an explicitly marked illocutionary act; ± Momentary is used as a feature as described earlier. X, Y, Z are argument variables whose case-role

and preposition-selection properties are indicated by first, second or third position in the next two items. 'Zero for indefinite' and 'zero for definite' indicate the conditions under which the explicit mention of an argument may be omitted.

Fillmore's approach will be seen to have been influenced by the ideas expressed by Austin in 'How to do things with Words' (1962). Because of his dissatisfaction with the concentration in linguistic philosophy on referential meaning and the truth and falsehood of statements, Austin posed the question, 'what sort of act do we perform when we utter a sentence?'. He called this the illocutionary force of an utterance; the locutionary force on the other hand corresponded roughly to the referential or cognitive meaning which had been the traditional concern of linguistic philosophers and the perlocutionary force corresponded to whatever sort of function or fulfilment of intention is accomplished by a sentence. The illocutionary purport of an utterance is to be expressed in terms of 'happiness' or 'felicity' conditions rather than in terms of truth or falsehood.

Blame: - Locutionary, - Momentary

| | |
|---|---|
| arguments: | X, Y, Z |
| cases: | Source + Experiencer, Goal, Object |
| prepositions: | by, on, for |
| normal subject: | X |
| direct object: | Y or Z |
| presuppositions: | X is human<br>Z is an activity Z1 or the result of Z1<br>X judges (Z1 is 'bad') |
| meaning: | X judges (Y caused Z1) |
| zero for indefinite: | X |
| zero for definite: | Z |

Accuse: + Performative, + Locutionary, + Momentary

| | |
|---|---|
| arguments: | X, Y, Z |
| cases: | Source + Agent, Goal, Object |
| prepositions: | by, Ø, of |
| normal subject: | X |
| direct subject: | Y |
| presuppositions: | X and Y are human<br>Z is an activity<br>X judges (Z is 'bad') |
| meaning: | X indicates (Y caused Z) |
| zero for indefinite: | X |
| zero for definite: | Z |

## 4. Some European Approaches

### (a) Louis Hjelmslev

In an article in Malmberg's anthology "Readings in Modern Linguistics' (1972), Hjelmslev listed the five fundamental features involved in the basic structure of any language.

He has expressed these points in terms less exact than the careful or well-informed linguist might like, presumably with the purpose of helping a more general readership to gain some insight into the notions involved. His formulations are made more exact, as we shall see, in the principal statement of his ideas 'Prolegomena to a Theory of Language'.

"1. A language consists of a content and an expression.

2. A language consists of a succession, or a text, and a system.

3. Content and expression are bound up with each other through commutation.

4. There are certain definite relations within the succession and within the system.

5. There is not a one-to-one correspondence between content and expression, but the signs are decomposable in minor components. Such sign components are e.g. the so-called phonemes, which I prefer to call taxemes of expression and which in themselves have no content, but which can build up units provided with a content e.g. words."

Hjelmslev's linguistics describes the relational pattern of language "without knowing what the relata are ..... phonetics and semantics do tell what those relata are but only by means of describing the relations between their parts and parts of their parts." In the terminology of his 'Prolegomena', linguistics is a metalanguage of the first degree whereas semantics (as well as phonetics) is a

metalanguage of the second degree. That is to say, linguistics is concerned with the description of the relational pattern of language with no regard to the substance or relata. Semantics and phonetics on the other hand are concerned with the relata "but only by means of describing the relations between their parts and parts of their parts."

From this brief statement, it will be seen that Hjelmslev's approach to linguistics and, in particular, semantics is very different from any of the others discussed so far. Indeed semantics, in the sense in which it is used by any of the linguists so far dealt with, is not linguistics but a science concerned with "nothing less than the world surroundings us and the minimal particular meanings of a word .... are the things of the world." (Sproget) But Hjelmslev is none the less concerned with the analysis of content to the point of registering the ultimate elements and he incorporates his ideas on this in his 'Prolegomena to a Theory of Language.' This is the main statement of his approach to language study and it is an elegant but difficult exposition of an elegant linguistic theory, consisting of 23 sections and 106 definitions. The sections follow one another in a closely reasoned schema, each section essentially presupposing what has gone before. Briefly, in Hjelmslev's view, linguistic theory must be "immanent ..... an organised totality with linguistic structure as the dominating principle." Immanence is an important aspect of his theory (we shall see it taken up later by Greimas). By it, he means that while language may be viewed from many different points of view - logical, psychological, physiological, sociological, historical, etc. - an autonomous science of language will only be possible when the linguistic point of view is central, that is, when linguistics is studied for its own sake, independantly of

other disciplines. For every process there is a corresponding system by which the process can be analysed and described by a limited number of premisses. But such a description must be 'scientific' by which Hjelmslev means it must satisfy the empirical principle - that is, it should be self-consistent, exhaustive and as simple as possible.

Because of the empirical principle, any theory based on an inductive approach (i.e. dependent on and derived from experience of even a wide and varied experience of languages) will be unsatisfactory because it could not be exhaustive; nor could such a theory be valid for all theoretically possible languages. Accordingly, only a deductive approach can be considered satisfactory since its method is a progress from class to segment, it is analytical and specifying. But, given that the theory is empirical and deductive, how is it related to the 'reality' which is its object? The theory is simultaneously arbitrary and appropriate. It is arbitrary in that it is independent of experience and contains no existence postulate: it is appropriate in that the premisses which the theoretician introduces from which the self-consistent calculus is developed are related to things which the theoretician knows from his experience can have application to empirical data. Since the main task of linguistic theory is to make explicit the premisses of linguistics as far back as possible, a system of definitions must be set up for this purpose. Linguistic theory must contain only a minimal number of implicit premisses and, therefore, the linguist must define his concepts as far as possible so that his definitions rest on defined concepts.

How may the descriptive procedure go forward? The method of analysis is through recognition of dependencies because "a totality does not consist of things but relationships and that not substance but only its internal and external

relationships have scientific existence." Combining the simpler terminology used in "Sproget" with that of "Prolegomena", we recognise the main types of dependencies as -

| Relationship | | Process (text) | System (language) |
|---|---|---|---|
| Reciprocal | Interdependence | solidarity | complementarity |
| Unilateral | Determination | selection | specification |
| Non-implicational | Constellation | Combination | autonomy |

On this basis, a process may be partitioned into chains and parts and a system articulated into paradigms and members. A function (i.e. "a dependence that fulfils the conditions for an analysis") between members of a paradigm is a correlation and between members on a syntagmatic level, a relation.

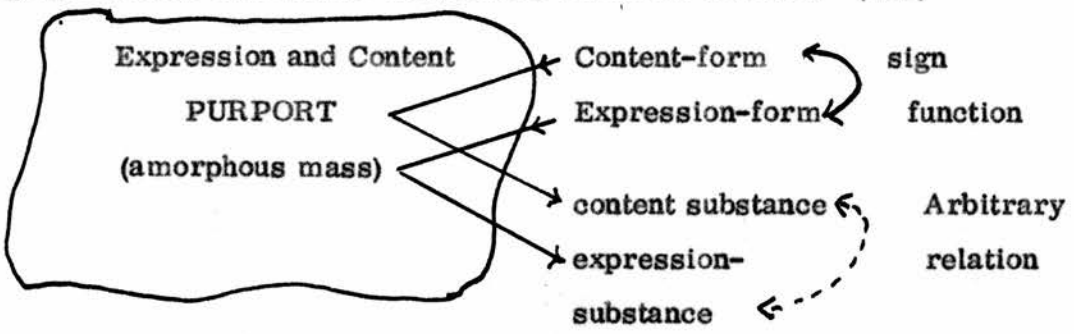
The procedure of the analysis is to partition the text stage by stage into chains of the greatest extension and to make an inventory at each stage of the entities that have the same relations. As the procedure goes on, the size of the inventories yielded at each stage will get progressively smaller and this is in accord with Hjelmslev's empirical principle which requires that the most adequate theory be that which leads to entities of the least possible extension and the lowest possible number. In addition, Hjelmslev points to examples of entities that in different contexts can be a sentence, a clause, a word and part of a syllable; that is, an entity can sometimes be of the same extension as an entity of another degree. In other words, an entity may on different occasions be a sign and a non-sign.

So the analysis cannot proceed without recognising that to comply with the

empirical principle content and expression must be analysed separately "with each of the two analyses eventually yielding a restricted number of entities which are not necessarily susceptible of one-to-one matching with entities in the opposite plane." (Prolegomena) These non-sign elements of expression and of content Hjelmslev calls FIGURAE. The sign is constructed from a restricted number of these and therefore "in this feature we have found an essential, basic feature in the structure of any language."

So the first stage of an analysis of a text will be a division into the expression plane and the content plane but Hjelmslev emphasises the solidarity of the expression and content functives in their contraction of the sign function. Apart from the structural principle itself, which Hjelmslev regards as a universal, a comparison of all known languages shows the factor they have in common is what Saussure called "substance" and Hjelmslev refers to as PURPORT. This exists as an amorphous mass, unanalysed and defined only by its external functions: it can be analysed from many different points of view and accordingly appears as so many objects. It is analysed in a different way by every language "like one and the same handful of sand, formed in quite different patterns." Its form is solely determined by the sign function of each language. Thus the content-form and the expression-form stand in arbitrary relation to the purport and transmute it into content-substance and expression-substance. "By virtue of the sign-function and only by virtue of it, exist its two functives which can now be precisely designated as the content-form and the expression-form. And by virtue of the content-form and the expression-form and only by virtue of them, exist respectively the content-substance and the expression-substance which appear by the form's being projected on to the purport, just as

an open net casts its shadow down on an undivided surface." (Ibid)




Content and expression "are bound up with each other", as noted earlier, by what Hjelmslev calls commutation: that is, commutation on one plane, uses reference to the other plane for the purpose of establishing identity. In order to satisfy the empirical principle as to simplicity, it is important to be able to identify variants and infer from them to invariants, especially for the last stage of the analysis where the number of these ultimate elements should be as small as possible. Invariants are registered by extracting the distinctive factor. Thus there "is a difference between invariants in the expression plane when there is a correlation .... to which there is a corresponding correlation in the content plane, so that we can register a relation between the expression-correlation and the content-correlation." (Ibid) This is the commutation test and it applies to the content figurae in the same way as to the expression figurae. On the expression-plane, for example, the sign-expression 'category' can be decomposed into the non-sign entities 'cat' 'e' 'gory' all three of which at a different degree can be the totally unrelated signs 'cat' 'eh' 'gory'. But there are difficult problems when the procedure is applied to the content plane. A content analysis of, for example, 'stallion' into 'he' and 'horse' is unacceptable to many critics of Hjelmslev's position, on the argument that these elements are not non-signs in that they can be

correlated with minimal signs. This is true unless one regards 'he' and 'horse' as elements of a different degree; that is, to regard them as "x" and 'y' which on the sign level are associated with an expression-form to contract the sign-function 'he' (male personal pronoun 3rd person singular) and 'horse'. There is certainly a problem involved in regarding content figurae as analogous with distinctive features in phonology. The extension of the latter can be independently (of linguistics) described by phonetic (realisational) features. The extension of content figurae would seem to depend however on pinning on the figurae the value of signs in the language itself.

So, for Hjelmslev, the special task of linguistics is that of establishing a science of the content and a science of expression on an immanent basis. Clearly the science of phonetics and the science of semantics would not enter into this. (The problem with the content-figurae is perhaps that there is not such an experimental science of semantics to parallel phonetics.) A science of linguistics of the sort intended by Hjelmslev would be "an algebra of language operating with unnamed entities i.e. arbitrarily named entities without natural designation, which would receive a motivated designation, on being confronted with the substance." The problem is that content figurae receive a designation not by confrontation with substance but by reference to linguistic signs in the same language. This scheme Hjelmslev calls 'glossematics' and the minimal forms which a theory requires to be established as bases of exploration are glossemes, the irreducible invariants.

Hjelmslev's influence (and behind that Saussure's) is seen in the work of other European and American scholars (e.g. Sidney Lamb) who have tackled the problem of semantics.

(b) A. J. Greimas

Many of the terms and ideas expressed by Hjelmslev are employed by Greimas in his 'Sémantique Structurale'. Indeed, in the course of his examination of the relationship of form and substance in chapter two, he reproduces Hjelmslev's much quoted example of the anisomorphic nature of colour terms in English and Welsh. He takes the view that Hjelmslev developed in the 'Prolegomena' on the nature of substance and its relation to content and expression. "L' opposition de la forme et de la substance se trouve donc entièrement située a l'intérieur de l'analyse du contenu; elle n'est pas l'opposition du signifiant (forme) et du signifié (contente), comme une longue tradition du XIXe siecle voudrait nous le faire admettre. La forme est tout aussi signifiante que la substance, et il est étonnant que cette formulation de Hjelmslev n'ait pu trouver jusqu'à present l'audience qu'elle mérite."

The main task Greimas sets himself in this very wide-ranging study is to identify the fundamental concepts of semantic analysis and to develop a new metalanguage for the subject. In fact he describes three superimposed metalinguistic levels - the descriptive, the methodological and the epistemological - and coins ar borrows a number of terms to express the concepts involved. The area of semantics for Greimasis, as Hjelmslev said, "nothing less than the world around us". "Le monde humain nous paraît se définir essentiellement comme le monde de la signification ..... c'est dans la recherche portant sur la signification que les sciences humaines peuvent trouver leur dénominateur commun." (Greimas 1966) And linguistics is well placed to deal with this situation because (as Hjelmslev again observed) any other system of communication can be translated into ordinary language

whereas the reverse is not true. Greimas draws on the insights of anthropology and symbolic logic in the course of developing his thesis and notes that "les langues naturelles possèdent un signifiant relativement simple et en partie déjà analysé, qui permet l'elaboration de techniques de plus en plus sûres et de plus en plus nombreuses de verification des écarts de signification."
As the first steps in his efforts to evolve a conceptual structure for semantics in its broadest sense, Greimas starts with the belief that perception is "le lieu non-linguistique ou se situe l'appréhension de la signification." He follows Saussure and Hjelmslev in accepting the concepts of signifiant and signifie and the relationship between them of reciprocal implication.
This leads him to the development of the concept of semantic axis. "La structure élémentaire doit donc être recherchée non pas au niveau de l'opposition pas vs bas mais au niveau de celle de p vs b. Il est admis de considérer que cette opposition consiste dans le caractère voisé vs non voisé des deux phonemes." These two phonemes can be contrasted because "leur opposition se situe sur un seul et même axe, celui du voisement" (the well-known distinctive features of phonology). On the semantic plane, the same sort of distinction can be made between

blanc vs noir : grand vs petit

where in the first pair the perspective they share is "l'absence de la couleur" and in the other "la mesure du continu." So Greimas' semantic axis is "ce dénominateur commun des deux termes, ce fond sur lequel se dégage l'articulation de la signification." Thus the expression A/r (S)/B (where A and B are the 'termes-objets' and S the semantic content of the relation) could be applied to fille and garçon; fille r (sexe) garcon = fille (feminité) r garçon (masculinité).

So two or more terms which have a common semantic denominator are said to lie on the same 'semantic axis' in the same way as the phonemic opposition between p and b lies on the axis of voicing. With fille and garcon, we can extract from the axis of sex, the semantic features of feminity and masculinity respectively. These are the minimum semantic features and Greimas uses a term of Pottier's to characterise these "differential elements" - the sème. So "le sème s est un des elements constituant le terme-objet A, et que celui-ci, au bout d'une analyse exhaustive, se définit comme la collection des sèmes $s_1$ $s_2$ $s_3$ etc."

On the plane of the signifiant, the smallest unit of discourse is the phoneme and on the plane of the signifié ("ou du plan de l'expression et du plan du contenu, si l'on adopte la terminologie danoise") the minimum unit of discourse is the lexème. Like many other linguists, Greimas avoids the loose term 'word' altogether and distinguishes between

| Lexème | para lexème | syntagme |
|---|---|---|
| (abricot) | (pomme de terre) | (pain de seigle) |

The relationship between the lexemes of the 'manifestation' and the marker-like semes is illustrated by the following table:-

| sèmes / lexèmes | spatialité | dimensionalité | verticalité | horizontalité | perspectivité | lateralité |
|---|---|---|---|---|---|---|
| haut | + | + | + | - | - | - |
| bas | + | + | + | - | - | - |
| long | + | + | - | + | + | - |
| court | + | + | - | + | + | - |
| large | + | + | - | + | - | + |
| étroit | + | + | - | + | - | + |
| vaste | + | - | | | | |
| épais | ++ | - | | | | |

Greimas points out that the collections of sèmes of which the lexèmes are composed, read from the left to right, are in a relation of hyperonymy and, read from right to left, a relation of hyponymy. So the lexème does not seem a simple collection of sèmes but as a group of sèmes related amongst themselves in hierarchical terms. We will note a more full examination of these terms by Hervey in the section which follows.

The signifié of a lexème is made up of a 'noyau sémique', a semic nucleus, which is constant and of contextual semes which are variable. "En effet, les définitions que nous venons de donner du noyau sémique Ns et du sème contextual Cs nous permettent maintenant de considérer l'effet de sens comme un sémème et de le définir comme la combinaison de Ns et de Cs." So the combination of the semic nucleus and the contextual sème within the lexème is called a sémème, so

"sémème Sm = Ns + Cs"

The two components of the sémème belong to two distinct levels. The semic nucleus is located on the semiological level while the contextual sèmes are situated on the semantic level and are mainly classificatory in character (human,

animal, etc.). Greimas takes another term from Pottier and calls them 'classèmes'.

Greimas illustrates this with the "séquence de discours très simple" - Le chien aboie

In this, the semic nucleus ($Ns_1$) is taken to be something like "sorte de cri" and the presence of two types of subject which could be combined with aboie are noted i.e. animal ($Cs_1$), le chien; humain ($Cs_2$) l'homme. Their combination with $Ns_1$ constitutes two different sémèmes.

$$Sm_1 = Ns_1 + Cs_1 \text{ (in animal)}$$

$$Sm_2 = Ns_1 + Cs_2 \text{ (in humain)}$$

Using the lexème chien in two different contexts, Greimas notes another 'sème commun', viz. 'object'. So for the lexèmes aboie and chien, account is taken of the constraints on the possible combinations of contextual sèmes, and two formulations are possible

$$L_1 \quad N_1 + C(S_1/S_2)$$

$$L_2 = N_2 + C(S_1/S_3)$$

So the contextual sèmes are seen to be disjunct in the semic categories

animaux vs humains

animaux vs objets

"épuisant de cette facon, avant même leur manifestation dans le discours, tous les emplois possibles des lexèmes analysés."

The distinction between 'immanence' and 'manifestation' is important in 'Sémantique Structurale'. The sème does not exist on its own but only "grâce à sa participation à deux ensembles signifiants à la fois: le sème, en effet, s'affirme, par disjonction, à l'intérieur de la catégorie sémique; il se confirme,

par jonction avec d'autres sèmes, a l'intérieur de groupements sémiques."

The first state is what Greimas means by immanence, the latter manifestation.

| IMMANENCE | MANIFESTATION |
|---|---|
| niveau sémiologique: catégories sémiologiques → systèmes sémiques → sèmes<br>niveau sémantique: catégories classématiques | termes sémiques: figures nucléaires, bases classématiques → sémèmes |

(c) S. G. J. Hervey

Hervey's theory of semantics is based on the premisses of axiomatic functionalism as developed by Jan Mulder. The two main premisses of this theory are (1) that only functional features (that is, features that are significantly opposed to their absence) are to be considered and (2) that language has a double articulation. Although references in their work to Hjelmslev are frequent, they are not 'glossematicians'. However, a number of his terms and, more importantly, some of his approaches to linguistic theory have been incorporated into their work. Mulder's is a strictly deductive theory and an important feature of it is the ontological distinction drawn between linguistic theory and linguistic descriptions - for Mulder as for Hjelmslev in a linguistic theory there is no 'existence postulate'. The statements of axioms, theorems and definitions in the theory are devoid of direct empirical content, though the axioms are 'arbitrary' and 'appropriate' (in a sense akin to Hjelmslev's).

Linguistic description, however, refers to a selected set of speech phenomena and the statements of the description are hypotheses which are testable both in the light of the speech data to which they refer and of the properties they attribute to those speech data. These hypotheses are 'scientific' in the Popperian sense that empirical statements of a general nature can never be proved though they may be falsified. However, the theory must provide valid principles in the light of which empirical testing of descriptive hypotheses is possible in a rigorous and consistent manner. So before the question of falsification can arise, descriptive statements must be justified on the basis of their consistency with the theory.

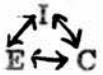
But perhaps the most important aspect of Mulder's theory (and, he would

argue, this should be the case for any other linquistic theory) is the notion of the 'sign'. Although he agrees with Hjelmslev's definition of the sign (that is, expressed in terms of relations rather than as a certain type of entity), he points out that Hjelmslev's sign-concept does not allow for 'the double articulation', which for functionalists is the defining property of language. In the foreword to their 'Theory of the Linguistic Sign' Mulder and Hervey emphasise the fundamental importance of the sign-concept: "A theory of the linguistic sign not only determines the form and content of 'grammar' and 'phonology' but that of 'semantics' as well. It pervades and determines every area of linguistics, including that of 'phonetics'."

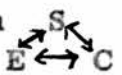
Another important respect in which the approach of Mulder and Hervey differs from that of Hjelmslev is that while Hjelmslev's concern was to set up an 'algebra' of linguistic relationships and leave the sciences of phonetics and semantics to one side, both Mulder and Hervey take it as part of their concern to establish the nature of the relationship that exists between the theory and the universe of sounds and of denotables (Mulder 1973). Mulder's linguistic theory is firmly embedded in semiotics; in their article 'Index and Signum', certain notions are elaborated that have a direct bearing on Hervey's semantic theory, including his identification of semantic features.

They discuss the notion of 'information-value' which "has to do with the PURPORTED information to be conveyed but .... it is not the same thing." Anything which has information-value they call an INDEX and the abstract information-value of an index is its DENOTATION. Consequently, in the formulae IRD and DRI, (that is, an index does not exist as an index outside such a relation with a denotation, and vice versa) an index is a form that has denotation and a

denotation is the information value of a form. All the variants of a form taken together make up a class and therefore it may be said that there is a class of forms each member of which has the property of having a specific same denotation. The member forms are called 'morphs' or 'allomorphs' when more than one. Within an index, Mulder and Hervey distinguish between expression and content which are aspects of the same thing and therefore because all three mutually imply one another they are equivalent and this may be expressed as




A further distinction is made between natural and conventional indices. 'A natural index, as opposed to a conventional one, only needs a knowledge of the natural phenomena, their laws or causal relations, for its correct interpretation.' (1972) 'In this respect, it is only relevant that the R part of the relation is natural or conventional. On this basis 'natural Indices' and 'signa' are distinguished; the latter can be further categorised into 'symbols' (signa which are dependent on an occasional definition for their correct interpretation) and 'signs' (signa with a wholly fixed conventional denotation). Communication-systems that contain signa (conventional indices), Mulder and Hervey call 'Semiotic Systems'. On this basis, a semiotic system is 'any system of CONVENTIONS for communication.'

The sign is the conjunction of an expression and a content in a mutual implicational relationship. Expression and content are each other's converse and equivalent to each other, so that it is just as acceptable to refer to 'content' as a class of allomorphs as it is to refer to 'expression' or the sign as a class of allomorphs. Mulder's expression formula 

expresses this relationship viz. "a particular sign is equivalent to a particular expression and a particular content in an equivalence relation."

At this stage, before looking specifically at Hervey's semantic theory, it would be relevant to examine briefly Mulder's ideas in phonology and grammar which lead ultimately to his expressing the relationship between phonology and phonetics in respect of 'phonetic features'. The reason for doing so is that although we are interested in 'semantic features', Mulder's work predates Hervey's and the solutions that Hervey proposes are related to and consistent with Mulder's. The distinctive function of a sign ('S') is determined by the set of signs with which it commutes. Accordingly, the formula e = {p} Rs means that 'expression' (e) equals a certain class of phonological forms {p} standing in a relation (R) with a certain grammatically distinctive function and c = S R̆{p} since c ('content') is the converse of e. The sign is the conjunction of e and c. {p}Rs is a set containing the members p1RsUp2RsU.... pnRs and these members are called morphs (allomorphs if there is more than one). Since sign, expression and content are equivalent we can say of each that it is a class of allomorphs.

The distinction is made between an allomorph and a phonological form (or feature) which Mulder describes as "a phonologically distinctive (i.e. differential) form or feature." A phonologically distinctive form or feature can be regarded as a class of allophones. But an allophone is not just a phonetic feature: the latter is an allophone if it has differential function in phonological terms. "That is....allophones ARE not phonetic features or forms, but they HAVE phonetic features or forms." Where f symbolises a phonetic feature and d a phonologically distinctive function assessed by commutation, a phonological form may be represented by the formula {f}Rd. Just as a sign or an expression was seen as a class of allomorphs, so a phonological feature is a class of allophones -

{f} Rd = f1RdUf2Rd .... U fnRd

Consequently, "a particular phoneme is a specific class of phonetic forms {f} in its capacity of having a specific function d in the phonological system in question and a corresponding allophone is a specific phonetic form in its capacity of having such a specific function d." This 'sign' can be linked up with phonological features and ultimately through these with phonetic features. The parallel task is to link the sign to its 'meaning' by using certain relations between signs and their 'information value'.

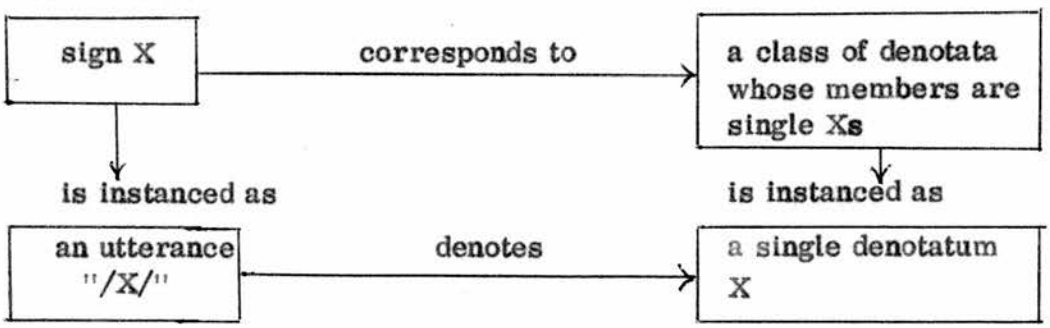
The empirical data that Hervey is dealing with are the speech events of the language and the sign itself is a model in the theory and not a fact belonging to the empirical data. Each sign is set up in such a way that it applies not to a single individual speech fact but accounts for classes of distinct speech facts between which there is some similarity. A realisation of a sign is a single speech event which belongs to the class of facts for which the given sign is a model. To enable the sign to be defined as a class of items between which a relationship of 'similarity' holds, an item is set up in the model applying to individual realisations of signs. This item Hervey calls an 'utterance'. Thus an utterance is an individual member of a sign, a model for single speech facts having both form and meaning, and each sign can be viewed as a certain class of utterance. Each utterance must have an item to account for the acoustically observable aspect of a given speech fact and an item to account for the information value of the single speech fact and these Hervey calls the <u>form</u> and the <u>reference</u> respectively. So an utterance is the conjunction of a form and a reference at a given space-time point and every utterance is a one-to-one relation between a specific form and a specific reference. Every reference is a model in the

theory for a certain information value whose substance is an object, quality, event or relation in the universe.

A sign is therefore a class of equivalent utterances (where equivalent means 'functionally identical' or 'representing the same'): a class of equivalent forms are the forms of all utterances belonging to the same sign and a class of equivalent references are the references of all utterances belonging to the same sign.

| class of equivalent forms r class of equivalent references<br>EXPRESSION |
|---|
| class of equivalent references R class of equivalent forms<br>CONTENT |

By definition, no two utterances may have identical references but they may have 'similar' references in the sense that the object, quality, event or relation underlying each is the same empirically determined entity. Since 'reference' and 'underlying object' are two distinct notions, Hervey introduces the technical term 'denotatum' to express the latter. The relation which holds between the underlying denotatum and the reference (and by definition the utterance) is one of correspondence. If each utterance of the sign denotes a single denotatum, then the equivalence-class of utterance that is the sign will correspond to a whole class of the individual denotata of its member utterances.



The notion 'denotation class' is an important element in Hervey's theory because it is in relation to this that semantic identity, non-identity and similarity are tackled. For example, the definition of synonymy derives from the possibility of non-identical signs being denotationally equivalent in so far as they have identical denotation classes. The signs 'adult male horse' and 'stallion' are two different signs and therefore the utterances which are their respective members contain references belonging to two different classes of equivalent references. But the set of denotata which constitutes the denotation class of the one sign is also the set of denotata which constitutes the denotation class of the other; consequently, since the two signs have identical denotation classes, they are synonymous.

The semantic identity of a sign is positively determined by the class of equivalent references, belonging to that sign and negatively determined by opposition to the classes of equivalent references belonging to all other signs which are opposed to that sign by commutation in equivalent contexts. The positively determined semantic identity of a sign can be characterised by semantic features while the negatively determined identity is the semantic function of the sign. We noted earlier that in phonology, the identity of a phoneme is positively determined by the class of allophones which can be realisations of that phoneme and negatively by all the other phonemes to which it is opposed by commutation in equivalent contexts. In phonology, identity can be stated in terms of distinctive function by listing the items to which it is opposed by commutation, but this is impossible for signs because of the infinitely large number involved.

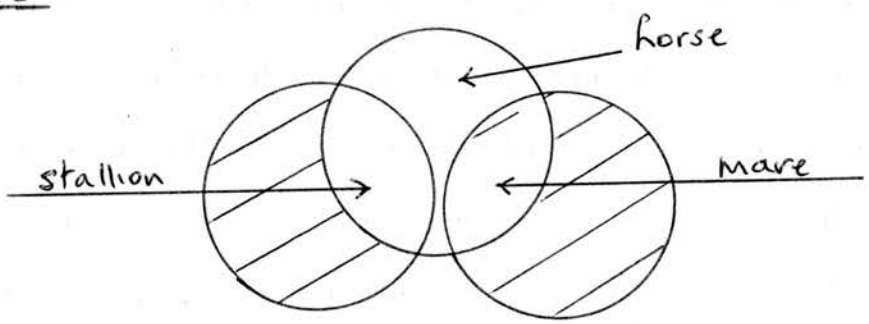
Hervey's task is to set up an analogous procedure for stating the semantic

identity of each sign in terms of those functionally relevant properties of its class of equivalent references which set it apart from the classes of equivalent references of all other signs. These are its semantic features.

While the theory precludes classes of equivalent references from having members in common, it allows them to have properties in common by virtue of the fact that denotation classes may have members in common. If the denotation class of the sign X properly includes the denotation class of the sign Y, then the sign X is a hyperonym of the sign Y: the converse relation is hyponymy. An example of this relation is seen in 'horse' and 'stallion' where the sign 'horse' is a hyperonym of the sign stallion.

If the signs X and Y are both hyponyms of a sign Z but neither is a hyperonym of the other, then Hervey calls these signs paranyms with respect to the sign Z.

Figure 1



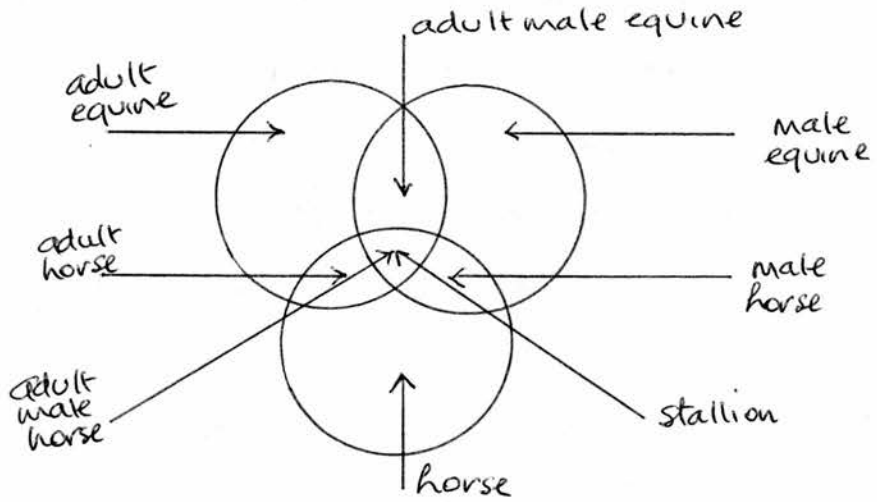

In figure 1, the signs stallion and mare are paranyms with respect to the sign horse.

If the denotation class of the sign X properly includes the denotation class of the sign Y and the denotation class of the sign Z properly includes the denotation class of the sign X then the sign Z is an indirect hyperonym of the sign Y.

Signs that are paranyms of one another with respect to a direct hyperonym are in a relation of direct paranymy and if the sum of the denotation classes of a set of direct paranyms is identical with the denotation class of their direct hyperonym, then the set of direct paranyms forms a complete direct paranymy class.

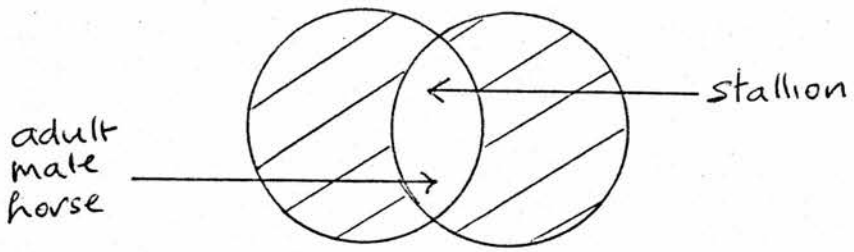
The relevant class attributes result only from direct proper inclusion, defined as the relation between the denotation class of a sign X and the denotation class of its direct hyponym. The semantic features of a class of equivalent references (or of a sign) are those properties which specify the relevant class attributes of the denotation class appropriate to the class of equivalent references in question. For example, in stallion a class attribute will be adult horse ('adult horse' is a direct hyperonym of 'stallion'). The semantic feature that selects the above class attribute shall be labelled *adult horse*.

Figure 2 Denotation Classes



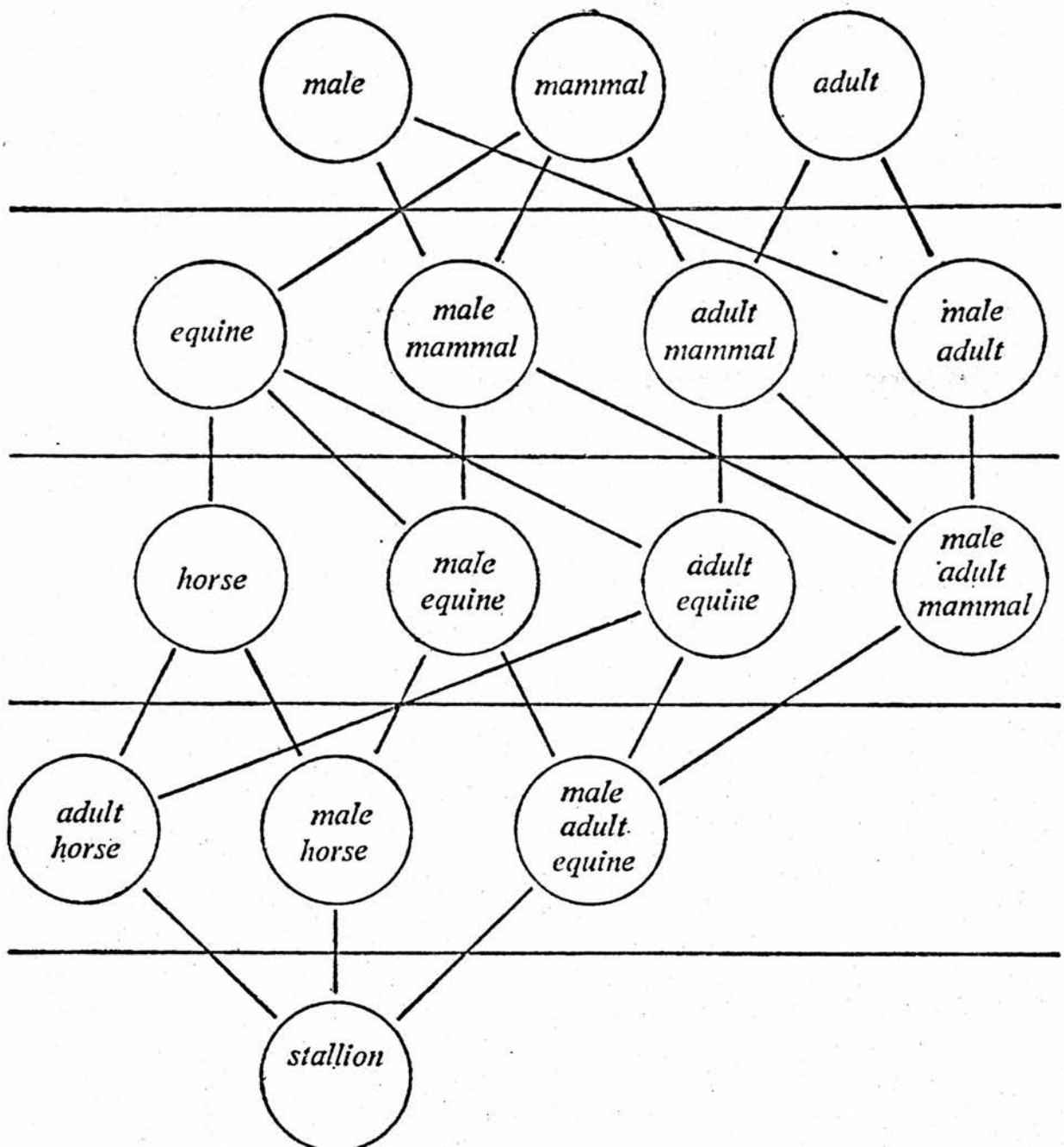

Signs with identical denotation classes (synonyms) have all their semantic features in common and the classes of equivalent references of such signs are called denotationally equivalent classes of equivalent references. For example, all members of the denotation class of 'stallion' are also members of the denotation class of 'adult male horse' and vice versa - *adult male equine* *male horse* *adult horse*.

Figure 3




By using the relations of hyperonymy, hyponymy and synonymy, signs can be ordered into a hierarchical network which is more revealing of semantic structure than either a hierarchy or a network alone.

Figure 4



## 5. Review and Comment

The main aim of this dissertation has been to examine how a number of linguists have set about the problem of identifying the minimum, irreducible elements of meaning in language. A subsidiary purpose was to select for description the work of linguists who could be said to represent the broad sweep of recent ideas and of theoretical approaches in semantics. The need to contain the scope of the dissertation within certain limits has meant that the work of very many important linguists could not be touched upon at all. In addition, it should be emphasised that most of the linguists referred to are actively involved in developing their ideas: what is represented in the dissertation is a statement of their thinking at a particular stage. This applies particularly to the work of Katz which is represented here by the paper he wrote with Fodor and published in 1963.

If the linguists represented in this survey can be said to occupy different theoretical positions, perhaps the most fundamental difference amongst them is a division into those who take a 'universalist' view of semantic structure and those who take a 'relativist' position.

According to the universalists, the vocabularies of all human languages can be analysed either totally or in large part in terms of a finite set of semantic components. These components are taken to be independent of the semantic structure of any one particular language. In phonology, Jakobson developed a universal inventory of distinctive features which, he maintained, were independent of the phonetic structure of any one language. Each language employed a subset of these features accolding to its own conventions. In the same way, it was felt a universal inventory of semantic components could be identified from which each language would simply draw its stock of components.

The /

The components would be combined in various ways by each language to render 'senses' or 'concepts' particular to that language. Thus, according to Katz, "semantic markers represent the conceptual elements into which a reading decomposes a sense. They thus provide the theoretical constructs needed to reconstruct the interrelations holding between such conceptual elements in the structure of a sense" (Katz 1966). Katz and Fodor do not indicate how they arrive at their semantic components (markers) but by implication, it is reasonable to assume that they do so by intuition. As Bolinger demonstrated, the inventory of markers is potentially infinite. Despite Katz and Fodor's insistence that a "marker such as (Human) or (Color) is ... not an English word, but a construct represented by one "there must be a strong suspicion that the semantic components which Katz and Fodor identify are interpreted on the basis of their intuitive understanding of the lexical items in English which they employ as labels.

A unversalist interpretation is taken by Bendix, although his view of 'components' is different from the conceptualist ideas of Katz. He has Jakobson's universal inventory of binary oppositions in mind when he suggests that "the metalinguistic features of meaning ... would form a growing stock of elements for semantic description, much as the stock of phonetic features can be used to describe different languages. The cross-linguistic validity of such semantic elements is based on the prima facie intertranslatability of languages to a significant degree". However, the argument for universal components is a weak one indeed if it rests on the evidence of 'intertranslatability'. Lyons (1963) has suggested that access to the semantic structure of a foreign language is most readily gained at the point represented by cultural overlap and he has observed elsewhere (Lyons 1968) that it is those linguists "who have had some experience of the problems /

problems of trying to compare the semantic structure of different languages in a systematic fashion "who believe that there are few, if any, universal, language-independent constraints ... upon semantic components". A strongly universalist view is held by Bierwisch, too, who states that "all semantic structures might finally be reduced to components representing the basic dispositions of the cognitive and perceptual structure of the human organism". He offers no evidence in support of this stand.

Nor does Fillmore make any explicit attempt to justify his claim that his components are universal. He says ambitiously that "the ultimate terms of a semantic description I take to be such presumably biologically given notions as identity, time, space, body, movement, territory, life, fear etc. as well as undefined terms that directly identify aspects of or objects in the cultural and physical universe in which human beings live." (1971). It is worth noting that these a priori, "biologically given" notions are in fact expressed in English yet imply a single, unified cultural universe (a view that is not supported by the evidence of cultural anthropologists such as Conklin and Lounsbury). An equally daring claim is made in his article 'The Case for Case' (1968) that the list of cases he has identified "comprise a set of universal, presumably innate concepts which identify certain types of judgements human beings are capable of making about the events that are going on around them ...". Fillmore has no special insight that enables him to make such an assumption and he certainly advances no evidence to corroborate the claim. One is obliged to conclude that what Fillmore is doing, is claiming universality for such primitive terms as he finds useful for his case, terms that he has arrived at on a purely speculative basis.

McCawley, too, accepts the case for universal features though he insists that the /

the components should not be the feature-like markers which Katz recommends. With no supporting argument, his 'obvious proposal' is that the predicates of symbolic logic should be used instead for the semantic representation of sentences. He accepts Lakoff's observations made at the Texas Conference on Linguistic Universals "that there is an almost exact correspondence between the more basic syntactic categories and the primitive terms of symbolic logic and between the rules ... proposed as base component universals and the formation rules for symbolic logic". Fillmore, too, requires the lexicon to make available for each lexical item "that can be used as a 'predicate', the number of 'arguments' that it conceptually requires". Bendix draws "upon some of the methods of symbolic logic for analysing sentences ... in the definitions of items, their semantic components are also in the form of schematic sentences or functions". It seems to Bierwisch "most natural to consider semantic features essentially as predicate constants in the sense of the predicate calculus as developed in modern logic".

By going for universal features of this sort, these linguists in effect by-pass the study of purely linguistic conventions and thereby transcend linguistics proper. The appeal to logic (of whatever form) results in a description of logical rather than semantic structure, because the linguist is merely using the linguistic utterance to identify the underlying propositions; it is these propositional structures that become the object of his analysis. Thus a linguist such as Bendix identifies a sentence in the language with a logical formula, performs an analysis on the formula and presents this as an analysis of the sentence. Thus the sentences "The man hits it" and "l'homme le frappe" contain the same conceptually necessary arguments. Likewise, "j'ai faim" and "I am hungry" would receive the same propositional analysis, as would "I have a headache", "j'ai /

"j'ai mal à la tête", "me duele la cabeza". That is, the truth values of the utterances are the same and it is those that they have in common, not semantic structure. Since underlying proppositions are not subject to linguistic variation - they are not language-bound - they are not properly the subject of linguistic study. That is not to suggest that at some stage there will not be some means of relating the structures of a universal logical 'language' with the semantic structure of languages arrived at on a purely linguistic basis. Even then, 'translation rules' will have to be specified to make this possible. In an examination of the relationship of formal linguistics and formal logic, Janet Jean Fodor (1970) has pointed out that "even if it is true that semantic representations provided by a grammar will be identical to the formulae of a system of logic, this says very little until we specify which system of logic we have in mind ... No precise and explicit translation rules relating a natural language and a system of logic have ever been formulated".

This frequently results in linguists devising their own rules on an ad hoc basis or, in some cases, evolving allegedly universal rules that are in fact the product of their own linguistic intuitions as speakers of English. McCawley, for example, says that "it is necessary for semantic representation to separate a clause into a 'proposition' and a set of noun phrases which provide the material used in identifying the indices of the 'proposition' " (McCawley 1968) but this operation clearly involves problems of translation. Also, his suggestion that the elements of meaning encoded in the verb 'persuade' contribute notions of 'doing' 'causing' 'becoming' and 'intending' is based on little more than intuition. The tree diagram he provides could be regarded as a covert synonymous paraphrase of "Sally performed the action (do) of causing (cause) that there should come into being (become) an intention (intend) in Ted to bomb the Treasury building".

Fillmore /

Fillmore is open to criticism on the same grounds. In order to work with the "biologically given" notions he refers to, he would really have to claim omniscience science but, since he obviously does not, what he is doing is selecting as primitive terms what he deems intuitively necessary and convenient for his descriptions. In sharp contrast, Hjelmslev, Greimas and Harvey occupy a 'relativist' position on linguistic questions. This view is stated in its 'strong' (and as such untenable, in the view of these linguists) form by Sapir: "The worlds in which different societies live are distinct worlds, not the same world with different labels attached". Observation of a number of languages inevitably reveals that there are many terms that have no exact counterpart in any other language. The example given by Hjelmslev of how the colour continuum is subdivided by two different languages is perhaps the most widely quoted (though recent work by Berlin and Kay has suggested that there are some constant features underlying this diversity). But we also encounter many terms in one language which do seem to correspond to terms in another. Martinet (1964) states the position with characteristic clarity: "To each language there corresponds a particular organisation of the data of experience ... We already know that the words of one language may have no exact equivalents in another. This naturally ties up with the different modes of analysing the data of experience. It may well be that differences of analysis entail a different way of regarding a phenomenon or alternatively that a different conception of a phenomenon entails a different analysis of a situation. In fact, it is not possible to make a clear-cut distinction between these two alternatives ... Learning a new language does not simply involve putting new labels on known objects. It requires new modes of analysing what is referred to in linguistic communications". If the 'worlds' are as 'distinct' as Sapir suggests, this would leave little room for comparison between /

between languages and would mean translation from one language to another would be virtually impossible. However, the fact that the word 'dog' (to pick one example at random from many) in English corresponds to 'chien' in French suggests that the strong form of the Sapir-Whorf hypothesis is not tenable. As Lyons (1968) notes, "the acceptance of the view that particular languages reflect in their vocabulary the culturally important distinctions of the societies in which they operate, commits us to a certain degree of linguistic and cultural 'relativity' ... Translation from one language to another clearly depends upon this possibility". This means that for linguistic analysis a language must be taken on its own terms because "each language articulates in its own way both its sentences and its significantia" (Martinet 1968).

Hjelmslev, Greimas and Hervey all share the same view that in an autonomous linguistics, the linguistic viewpoint must be central. In Hjelmslev's terms, linguistic theory must be "immanent ... an organised totality with linguistic structure as the dominating principle". For these linguists, the 'sign' defined in terms of relations, is at the centre of any discussions of linguistic theory: a theory which lacks some sort of sign-theory is "a theory without a backbone ... Expression and content are inseparably united and ... the one implies the other and vice versa i.e. they are in a one-to-one relation of mutual implication for each instance of the sign" (Mulder and Hervey 1972). Accordingly, "only the linguistic signs proper to the given language may constitute therefore valid objects in semantic description" (Hervey 1974).

The first stage of Hjelmslev's analysis of a text is a division into the expression plane and the content plane and then by a successive division both planes are analysed until content figurae and expressionat figurae are arrived at. The commutation test is central to the process of arriving at these figurae.

Commutation /

Commutation is a key notion in all functionalist theories because it is by means of the commutation test that possession of distinctive function by an entity (whether phonological or semantic) with regard to at least one other entity in the language is established. To establish the distinctive function x and y we would do so by commutation as under:

x y
x z
q y

with the proviso that xy, xz and qy are all directly or indirectly associated with differential communicative potential.

Hjelmslev applies the commutation test not only to entities of the expression plane but to those of the content plane too:

sheep + he ≠ ram
sheep + she = ewe
horse + he = stallion

to establish the content figurae. "The exchange of one and only one element for another is in both cases sufficient to entail an exchange in the other plane of the language". There is a major difference between Hjelmslev's componential analysis and that of Katz and Fodor. The latter's conceptual markers, arrived at by intuition, are to be generalised across languages. The content figurae that Hjelmslev seeks to establish are completely language bound i.e. they are to be found in the lexicon of that particular language which is the object of study and no universal status is claimed for them. However, in the event, these figurae are of only limited interest because they account for only a small part of the lexicon. Such ordinary terms as table, chair, blackboard cannot be so readily analysed. It is open to debate just what Hjelmslev does achieve by substituting an assumed element such as "she-ness" for "he-ness" on the content /

content plane. Presumably the sign whose content is assumed to have this element is replaced by another sign that presumably contains the other element. Since both only 'presumably' have these elements, nothing in fact is demonstrated.

The extension to semantics of the notion in Prague School phonology that the minimum element of distinctive function, the phoneme, is a 'simultaneous bundle of distinctive features' has led to the lexeme being regarded as a simultaneous bundle of distinctive features of meaning (sèmes). There are two main requirements for this to be so. Firstly, it is necessary to be able to recognise and isolate 'pure meaning' i.e. to abstract meaning from signs. Secondly one must be able to perform valid commutation on the components, once recognised.

nature/ Can 'pure meaning' be isolated, given the unified native of the sign? For the purpose of examining the components, we might for the moment take the view that the complex of form and meaning might be looked at from the point of view of meaning and that no great harm would be done if we represent the meaning by the form. A componential analysis of colt might be:

bundles of sèmes

horse + young + male = colt
cattle + young + male = bullock
horse + adult + male = stallion
horse + young + female = filly

Similarly, ram

sheep + male + adult = ram
sheep + female + adult = ewe
sheep + male + young = *ram lamb
horse + male + adult = stallion

While the analysis seems to be satisfactory for colt, in the second analysis we find *ram lamb. The analysis does not work satisfactorily in the case of ram, which is a reasonably straightforward case. If phrase meaning were to be introduced /

introduced instead of the closed set of word sense, we would be introducing a potentially infinite number of meaning components.

A completely different analysis of ram might be given consisting of components such as:

ovine + domestic + adult + male + fleecy = ram
bovine + domestic + adult + male + fleecy = fleecy bull
ovine + nondomestic + adult + male + fleecy = wild ram
ovine + domestic + young + male + fleecy = ram lamb
ovine + domestic + adult + female + fleecy = ewe
ovine + domestic + adult + male + non-fleecy = shorn ram

This second analysis of ram underlines the fact that there is no satisfactory way of knowing how to choose between equally valid alternatives. Certain sections of the lexicon such as animal terms and kinship terms lend themselves reasonably well to analysis since our knowledge of the world suggests some outstandingly obvious parameters or axes, e.g.

animals - species, sex
kinship - parent, child

But the problem of deciding which parameters are relevant remains and probably rests ultimately on the ingenuity of the linguist.

Components such as horse, male etc are meant to identify 'pure meaning' but this cannot be so because 'meaning' is part of the fact that these are themselves signs in English. Like Lyons (1968), we "cannot avoid the suspicion that the semantic components are interpreted on the basis of the linguist's intuitive understanding of the lexical items which he uses to label them". Hervey's semantic features, on the other hand, are seen to be wholly language-bound. He employs the relations of hyperonymy (Lyon's 'superordinate'), hyponymy and synonymy to order signs into a hierarchical network of relations. The notion 'denotation class' is important in this theory because it is in relation to their denotation classes that signs are said to have properties in common, by virtue /

virtue of the fact that their denotation classes may have members in common. Hervey orders signs on the basis of relations that really hold between them, properties that they have relative to one another. What gives a sign its features is its denotational relations to other signs in the same system. The intuitive satisfaction that may arise from some of the semantic markers to be found in Katz and Fodor's analysis of bachelor (e.g. Human, Male etc) is attributable to covert recognition of straightforward hyperonymous and hyponymous relationships. Further, Hervey would claim that the purported propositional analysis of sentence types is a covert attempt at capturing the same kind of relationships with logical variables. His view is that the intuitive notion of semantic sentence-types is best regarded overtly as a matter of certain sentences being hyponyms of such other sentences as 'Somebody did something to something'.

In this survey, we have looked at a wide range of approaches to the whole problem of isolating the irreducible components of meaning. Far from their being identical, the 'primitives' range across a spectrum from the 'conceptual elements' of Katz and Fodor, the 'schematic sentences' of Bendix, the 'predicate constants' of Bierwisch, the 'predicate units' of McCawley, the 'cases' and 'notions' of Fillmore, the 'figurae' of Hjelmslev, the 'semes' of Greimas to the 'semantic features' of Hervey. While there is marked disagreement amongst these linguists on the universality of many of the notions put forward, at least there would be agreement with Hjelmslev's observation that "what is universal is ... the very principle of analysis itself".

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