STRUCTURE AT THE LEXICAL LEVEL AND ITS

IMPLICATIONS FOR TRANSFER GRAMMAR

by

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INTRODUCTION

IN the following discussion I shall present preliminary results from an investigation of structuring within the lexicon of a language. These results suggest that in certain areas of the lexicon lexical items must be characterized in terms of the presence or absence of specific recurring lexico-semantic components. Furthermore, there seems to be some promise that correspondence between lexical items of different languages may be reducible to mutual correspondence between their more discrete lexico-semantic components. Take, for example, the verbs in expressions of the following types: LEARN A WORD, KNOW A WORD, LOOK AT A PERSON, SEE A PERSON, LISTEN TO A SOUND, HEAR A SOUND, GET SOMETHING, HEAR SOMETHING, etc. Granted the pairing into LEARN: KNOW, LOOK AT: SEE etc., I shall show that far from their representing discrete pairs unrelated further in lexical structure, the first members of the pairs differ uniformly from the second members; i.e., LOOK AT is to SEE as LISTEN TO is to HEAR. Preliminary investigation of certain other languages shows that a comparable relationship holds among pairs like the French REGARDER: VOIR, ECOUTER: ENTENDRE etc. Recognition of such interlanguage correspondence provides the basis of a structural explanation for questions like the following: In what sense does "Je vois cela" correspond more closely to "I see that" than does "Je regarde cela"?

TRANSFER GRAMMAR

In this discussion, the more detailed descriptive statements about English as well as the general remarks about correspondence between English sentences and those of some other language should be considered in the framework of what I shall call transfer grammar, a term which has already been used by Z. Harris[1], though with certain differences. A transfer grammar consists of the rules appropriate for carrying the sentences of one language, given their structure, into the corresponding sentences of another language, also given their structure. Such a grammar thus describes, i.e. analyzes, the relationship of "correspondence" holding between certain structures of one language and those of another. For the moment, we can consider as a corresponding sentence, one which a bilingual speaker would offer as such. We shall not consider any complicated or border-line cases. Above and beyond the simple word-for-word rules (or even part-of-speech-for-part-of-speech) implying identical higher structure, the description of correspondence between different natural languages must meet demands made by differences in constituent structure and by the abstractness of certain construction types; i.e., by the absence at the word level of unambiguous markers of higher level differences. In the field of machine translation in particular, much of the recent refinement in describing interlanguage correspondence has been in that direction. In this paper, attention will be directed in another direction: toward possible refinements in correspond-ence analysis entailed by further structural characterization of lexical Items, and in particular, of verbs in terms of their relationship to subject and object.

PREVIOUS STATEMENTS OF THE PROBLEM

Interest in the problem of verbal categories is not new; it dates back to classical Greek philosophy. Here only a few more or less recent, selected remarks from linguistics and linguistic philosophy will be mentioned. Consider the following sentences:

1. The girl was dead.
2. He became president.
3. He worked all day.
4. The time elapsed quickly.
5. Solving the problem fatigued him.
6. He polishes the arrow.
7. He shot a hole in the wall.
8. Both of the brothers built a house.
9. He shook his finger.
10. He knows the answer.
11. He knows that you were there.

The problem involves the following notions about such sentences: a) that "grammatically" all of the sentences are the same in having a subject and a predicate and that (5) through (10) at least, but not (2) and (3) are grammatically the same in having a transitive verb and a direct object, b) that "notionally" or "semantically" the verbal categories are not the same: KNOW as in (10) and (11) refers to a state, and similarly the predicate in (1), WORKED as in (3) to an activity, BECOME as in (2) to a transition: and that the relationship between different verbs and their objects is not the same: in sentences like (6) the object can be described as one of effect(i.e. the arrow is affected by the polishing), in (7) on the other hand the object is one of result (i.e. the shooting results in the hole) as is the case in (8), and in (9) the object is one of instrument (i.e. the finger was used in the action). Opinion has differed considerably as to the structural status of such observations, and particularly of those in (b). Certain linguists have remarked that purely notional characterization of these differing relationships could be made according to any number of criteria. As Jespersen writes: "...on account of the infinite variety of meanings inherent in verbs the notional (or logical) relations between verbs and their objects are so manifold that they defy any attempt at analysis or classification"[2] In the form presented here (which is essentially the same way that they are described in the grammars that mention them) there is some question whether these distinctions are a grammatical matter at all. The following remarks, though not made specifically about English, are also relevant here: "Dabei sind die Begriffe des Zieles, des Objekts, der Zeitdauer usw. in der Grammatlk nicht weiter zu definieren, sondern sie sind als Realitäten anzusehen, welche in der Anschauung der Sprechenden vorhanden sind ... " "... man kommt natürlich immer wieder zu der Erkenntnis, dass in der Sprache selbst nichts gegeben ist als der Verbalbegriff und der Nominalbegriff und dass eine Eintheilung des Stoffes zwar unvermeidlich, eine jede aber nicht frei von Willkür ist."[3] Hirt, in criticizing Behaghel's use of "Beruhrtes und erzeugtes Objekt (object of affect and result, resp.), goes so far as to claim that the opposition is of no significance whatsoever.[4] While the observation of such differences is certainly not counterintuitive, still the criticism that these distinctions are not part of linguistic structure is justified when their assumption has no further consequence, i.e., when nothing is gained but satisfaction of Sprachgefühl by ascribing a structural nature to such distinctions, as undoubtedly would be the case in the possible classification into "legal and illegal" depending on the activity associated with the word. (That the subject-verb and verb-object relationships seem to be more basic is no valid argument, since the impression that certain distinctions are more basic to the language is one of the things we hope to make more explicit by structural description.)

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Whorf has his own characteristic interpretation of the subject-predicate
relationship, an interpretation very much in line with his notion of language
shaping thought. What he does is to reject the intuited notional differences
and project one particular dominant notional characterization over the
whole system. In the article "Language, Mind, and Reality" Whorf compares
the sentences "I strike it" and "I hold it" and says of the latter that
though HOLD "in plain fact is no action, we ascribe action to what we call
HOLD because the formula, "substantive + verb + actor = his action" is
fundamental in our sentences."[5] Even if we grant the basic correctness
of his observation about the similarity between HOLD and STRIKE, the nature
of what he calls "action" in the relationship "actor + his action" is not
at all clear, for what Whorf intends by the word "action" on the one hand
is nowhere explicitly stated and on the other hand is certainly not what
we regularly understand by the word. That is to say, as it stands now,
HOLD according to Whorf is an action which "in plain fact is not an
action". Without a characterization of this special sense of "action",
the statement is self contradictory and viewed from outside the language
where paradoxes like this are deprived of the flashes of intuition
capable of resolving them, at best reflects cognizance that some signifi-
cant similarity or other exists here.

    There is a contemporary school of philosophy, so-called linguistic
philosophy, which aims at ridding philosophical discussion of just such
misuses of ordinary language. Much attention is paid to distinctions
among verbs suggesting processes, states, occurrences, etc., the objec-
tive being the description of the concepts which result in our particular
use of such verbs.[6] Vendler presents an interpretation in terms of a
system of time relations based on a classification of "verbs" into four
types: activity terms like "pushing a cart", accomplishment terms like
"drawing a circle", achievement terms like "reaching the top" and state
terms like "knowing geography".[7] The classification is based on differ-
ences in usage. Many of the observations used to support his temporal
interpretation are linguistic in nature. He points out that some "verbs"
(e.g. in "He reached the top") are incompatible with certain lexically
paraphrasable expressions implying duration of time (e.g. "for three
hours") and that certain "verbs" (e.g. "He knows a good restaurant") do
not occur with elements more properly syntactic and without any one
consistent structurally equivalent paraphrase (e.g. the continuous
tense). These two types of criteria, unfortunately, are treated as if
they were equally well within our command. In fact, the observations
on the whole are made in a framework without any defined linguistic
structure. That he often uses "verb" in the sense of predicate or verb
phrase is just a terminological matter, but from a linguistic point of
view it frequently obscures the fact that rather minor variations in

sentence structure entail radical differences according to his classification. The absence of a complement in "He pushed the cart (into the garage)" makes the difference between an accomplishment term and an activity term. Singular number versus plural number in the direct object as in "He drew a circle" versus "He drew circles" represents the same difference. One notes the great complexity of the interrelation between grammatical devices and notions of time. The part of Vendler's paper that touches the subject-verb relationship with which we are concerned centres around the "well known differences between verbs that possess continuous tenses and verbs that do not ... This difference suggests that running, writing, (as opposed to knowing, re- cognizing) are processes going on in time, i.e. roughly that they consist of successive phases following one another in time." Included in processes going on in time are the "pushing a cart"-type, the "drawing a circle"- type, but not the "reaching the top"-type or the "knowing geography"-type, but Vendler's interpretation of the time notion which he supposes to be associated with the so-called continuous tense excludes the occurrence of that tense with achievement terms like "reaching the top", although in fact we do in normal speech say "He is reaching the top" and "He is winning the game". Furthermore, the notion "process" (or its further clarification as "phases following one another") is hardly very revealing when used to characterize a verb such as that in "The old man is leaning against the wall"*.

STRUCTURAL CONSIDERATIONS

Let us return now to the set of sentences on page 4 and consider the structural correlates to the notion expressed there of grammatical similarity:

        4) The time elapsed quickly
        5) Solving the problem fatigued him

In all of the sentences on page 4, there is fairly strong evidence of grammatical nature for assuming that HE, THE GIRL, SOLVING THE PROBLEM and the other words and phrases that we conventionally call "subject" are, in fact, all representatives of a single grammatical category and that all of these sentences have in common the structural break-down into subject + predicate, despite not only differences in the constituents themselves but also various environmental incompatibilities (e.g. the so- called subjects vary from single words like HE to whole phrases like

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* Joos, as I recall, mentions special features in verbs like SIT, LIE, LEAN, shared by those like KNOW, HEAR in that with these the simple present cannot occur with the future adverb TOMORROW. "We leave for Washington tomorrow" but not "I know the song tomorrow", only "I will know the song tomorrow."

    Martin Joos, "Process and Relation Verbs in English" - oral presentation of a paper at the December 1959 meeting of the Linguistic Society of America.

SOLVING THE PROBLEM; among examples of the second type could be cited the fact that not all subjects are compatible with all predicates: although we have (4), we do not have "John elapsed quickly"; i.e., there is not even mutual interchangeability between elements which we suggest represent the same grammatical category). Among the evidence motivating a common analysis could be cited the occurrence of the "subject" forms of the pronoun: HE instead of HIM, etc., agreement in number on the part of the verb, and various syntactic phenomena in which the basic relationship of subject and predicate is maintained, regardless of the particular forms that the latter constituents assume (e.g. as well "They expected solving the problem to fatigue him", related to (5) as "They expected the time to elapse quickly" related to (4)). In very much the same way, from a grammatical point of view, a uniform structural analysis corresponding to what is commonly called "the verb and its object" is motivated by general correspondence of passive sentences (thus unlike sentences with the copula, e.g. "He was the criminal"), by the occurrence of related sentences with WHAT or WHO(M) instead of the object, and so on.

THE *DOING-SOMETHING* VERBS

Consider the following two sets of sentences:

    (A) 1) He left
         2) He blushed
         3) He went into town
         4) He looked at the chair
         5) He listened to the sound
         6) He bought a car
         7) He made the chair
         8) He struck the child
         9) He broke the chair
        10) He shot the arrow
        11) He took away the chair
        12) He put the plans into the drawer.

    (B) 1) He knew the answer
         2) He saw the chair
         3) He heard the sound
         4) He thought that it was true
         5) He was in a hurry
         6) He understood the problem
         7) He had a car

Notwithstanding such similarities in grammar between the two groups as the breakdown into subject + predicate or the membership in both of predicates

with the analysis verb + object, the sentences of (A) differ from those of (B) in their behaviour with respect to the following type of construction: "What he did was to strike the child" or, without the infinitival marker "to", "What he did was strike the child". For all sentences of class (A) there are related sentences with the DO-locution, while those of class (B), in ordinary usage, lack the same correspondents; e.g. "What he did was learn the answer" but not "What he did was know the answer"; "What he did was make the chair" but not "What he did was see the chair". "What he did was buy a car" but not "What he did was have a car". Similarly, with a second set of examples there is a related differentiation in the occurrence of "What he is doing is learning the answer" but not "What he is doing is knowing the answer"; "What he is doing is buying a car" but not "What he is doing is having a car", etc. The second set of examples of differentiation is not so significant in that the occurrence of the more complicated construction "What he is doing is Verb + ing" is dependent on the possibility of occurrence of the simpler construction "He is Verb + ing", and thus "What he is doing is having a car" could be considered, if taken alone, as excluded on the basis simply of the non-occurrence. The first set of examples, where the presence or absence of the progressive is not relevant, shows that there are independent reasons for considering sentences like "He had a car" different from those like "He bought a car". (This will be relevant is describing the interlanguage correspondences where the other language does not have a corresponding grammatical form). In the differentiation between expressions which occur with "What he did was..." and those which do not we have a structural correlate, though as yet unanalyzed, to one of the favourite notional characterizations of difference between the subject-verb relationship: that in which the verb expresses a state and that in which it expresses a process. The difference within the pairs SEE: LOOK AT, HEAR: LISTEN TO, HAVE: GET is matched by the absence: presence of this structural feature. The analysis of the structural difference observed here presents some interesting problems. The assignment of the difference to the verb which will be the analysis proposed here, rather than to the subject or even to the object is not so obvious when we consider the following observations. While it is true that the form CAR appears as grammatical object in both the "doing-something" set (A), (6) and (7), and in set (B) (7) and can also appear as grammatical subject in both types of constructions (e.g. "the car slid into a ditch" and "the car is very fast"), the same holds for the form HEAR (e.g. "the judge is hearing the case" and also "the Judge hears a sound") or HAVE in "the boy is having a big dinner" and "the boy has a lot of money", or "They felt the inner surface with their hand" and "The inner surface felt rough". The use of the neutral word "form" to refer to these examples is intentional, for there is structural evidence that the occurrences of

the nouns with the form CAR appearing in either construction are still instances of the same lexical item while the particular verbs in question are to be considered different at the lexical level. The evidence is the freedom in conjoining diverse constituents with the same lexical item, e.g. "the car that I saw and then bought..." or "the car that I had and then sold..." but impossibility of so telescoping different lexical Items which happen to have the same form - i.e. "The judge heard the case " and "The judge heard the crying" cannot be telescoped into "The judge heard the case and the crying" without disproportionate distortion of sense in one or the other. Thus assignment of the feature "doing something" or non-"doing something" to the verb is not arbitrary. And we can even accept difference with respect to this feature as a sufficient condition for considering instances of the same form as different lexical items.

Assigning the presence or absence of the feature to the verb, we can describe a structural relation between such pairs as (a) "He is looking at the car" and (b) "What he is doing is looking at the car". Such a statement can be considered as the rules for embedding (a) in some such envelope as "What he did was that":

>   He looked at the car
>   What he did was that
>   yielding: What he did was look at the car.

One might well question the arbitrariness of raising to such a crucial position in the description of verbs their behaviour with respect to a construction involving the particular word DO. Why not, for example, rather grant this position to PERFORM or INDULGE IN, which amount to about the same thing? Why not begin with "What he is indulging in is buying clothes'? The reason is that the form of the locution with DO is much more "highly grammaticalized" than is the case with that of INDULGE IN. By "highly grammaticalized" I mean that the form of the construction is not derivable by the regular expansion of some constituent but is dependent to a high degree on special features in the grammatical structure of elements around the construction. With INDULGE IN the noun phrase BUYING CLOTHES is just a regular object (e.g. "He indulged in buying clothes" or "What he is indulging in is fantasies" with a corresponding "He indulges in fantasies.) With DO, on the other hand, while WHAT and SOMETHING as well as IT and certain other substitute forms are its formal objects, BUYING CLOTHES is not a possible object. "What he is doing is buying clothes" but not "He is doing buying clothes". Furthermore, the agreement in aspect and tense between the DO construction and the verb phrase that follow is not characteristic of other constructions superficially similar to that with DO: "What he is doing is hitting me" or "What he did is hit me" but not *"What he is doing is hit me". It appears that the structure of HITTING ME in these constructions (unlike HITTING ME in "He

indulged in hitting me") is not that of a noun phrase at all but rather a special analysis of the predicate of "He is hitting" and thus paralleled to "What he did was hit me".

DIFFERENCES IN VERB-OBJECT RELATIONSHIP AMONG THE
DOING-SOMETHING VERBS

Consider now the following extended constructions with DOING-SOMETHING:

> (C) 1). What he was doing in the house was reading
> 2). What he did at the corner was turn around
> 3). What he did after the concert was drive home

In each case, WHAT HE DID..., is extended by a prepositional phrase repre-
senting an adverbial of time or place. Such extensions, are compatible
also with the underlying sentences reflected in the more complex structures
in the sense described above: "He read in the house", "He turned around at
the corner", "He drove home after the concert". This correspondence, how-
ever, does not hold with all prepositional extensions. "He looked at her"
has a corresponding "What he did was look at her" but not "What he did at
her was look". "They are concentrating on the problem" has a corresponding
"What they are doing is concentrating on the problem" but not "What they
are doing on the problem is concentrating". In other words, one of the
characteristics of the so-called objective complements (differentiating
them from adverbial complements) is the restriction on their corres-
ponding occurrence in the DOING-SOMETHING construction. A second lack of
correspondence is relevant to differences between verb-object relation-
ships. Consider the following:

> (D) 1). What he did to the arrow was polish it
> 2). What the story did to him was make him happy
> 3). What he was doing to the boy was hitting him
> 4). What solving the problem did to him was fatigue
>   him.

Clearly, the prepositional extensions are not possible in related sentences
like *"Solving the problem fatigued him to him". Quite contrary, the TO
extensions to the DO-SOMETHING clause can be considered the form that
objective complements assume when optionally repeated there, i.e. "What
it did was fatigue him" has a related "What is did to him was fatigue
him" However, not all transitive verbs followed by direct object have a
corresponding sentence with DO SOMETHING TO. Though there is a sentence
"He built the house" we do not, in ordinary usage, say "What he did to
the house was built it", or "What he did to the story was forget it",

"What he did to the book was buy it", "What he did to the sound was listen
to it". For reasons similar to those mentioned above for the assignment of
the feature "doing-something" to the verbs, we can assign the feature
"doing-something-to" to the appropriate sub-class of the former. Motivated
by the peculiarities of occurrence mentioned above, this feature provides
a possible structural correlate to the notion "object of affect". It is
true, however, that the area of hazy borderline cases becomes very large
when we attempt to characterize some random examples as a "doing-something-
to" verb or not one. This great area of indeterminacy is perhaps even
more exaggerated in other linguistic structures associated with verb-object
differences within the large class of "doing-something" verbs. Among the
"doing-something-with" verbs are certainly included those in "What he did
with it is put it in the drawer". "What he did with it is throw it away",
"What he is doing with it is holding it", "What he did with them was hide
them", "What he did with the paper was lose it", and (interesting enough)
"What he did with the cake was eat it" and "What he did with the milk was
drink it". Excluded from this class are probably those in sentences like
*"What he did with it was discover it" *"What he did with him was visit
him" *"What he did with her is forget her". Similar constructions in-
volve DO SOMETHING ABOUT SOMETHING and DO SOMETHING FOR SOMEONE, but
these become extremely general. The large area of indeterminacy, however,
need only be indication that this particular type of differentiation does
not embrace the whole verbal system. Within the area where the distinc-
tions hold, their explanatory power is considerable, as is the case
where they provide a general explanation in terms of some general re-
curring feature for the difference between "He removed the spot from
the table" and "He removed the book from the table", "He shot the
arrow" and "He shot the man".

THE GENERAL CHARACTER OF THE CONSTRUCTIONS

In the preceding discussion we have been concerned with differences
in the use of verbs in English and in particular in discovering those
differences which are of a more general systematic nature. Reference
was made to differences in the occurrence of the continuous tense and
to the use of present for future. Differences with respect to compati-
bility with the "doing-something" constructions were presented and
discussed at greater length. The former two, however, differ from the
latter in being simple grammatical reflexes of the verb categories in
question, whereas the constructions with DOING SOMETHING can be
thought of as pro-forms. These pro-forms are themselves equivalent
to the verbs in question in the sense that they are substitutable for
them. They are the grammatical paraphrase, in a sense, of the class of

forms they replace. (The pro-form character of the "doing-something" construction is seen even more clearly in its related form: "He pushed her today and did the same thing to me before"). Similar constructions occur in German and French: "Die Form ist also auch nicht so aufzufassen, wie das dieser Forscher tut." and "Piquez-le comme vous venez de la faire à l'autre". Neither of these languages possess a syntactic correspondent to the English periphrastic ING-form, but on the basis of rough correspondences between the English "doing-something" form and the French and German constructions, general similarities in lexical structure show promise of being described.

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