LOOK AND SEE

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Look and *see* are semantically and syntactically related, being similar in some respects and complementary in others. Their relationship can be elucidated by reference to the underlying strings into which they are inserted. Both these verbs appear to be verbs of motion of some sort: in the underlying strings, the set of prepositions specifically used in the verb phrase of a verb of motion may be generated. The aspectual complementarity between *look* and *see* follows naturally from the fact that they require mutually disjoint subsets of this set of prepositions.

In this paper we shall speculate on the syntactic and semantic nature of the verbs *look* and *see*. We will try to find the syntactic structures underlying the sentences in which these verbs are overtly manifested (Chomsky 1965).

The verb *see* is sometimes transitive, as in:

    (1a) The bird saw the nest.

Elsewhere, it is intransitive. In the latter case we see a set of prepositions utilized, e.g. in

    (1b) Bill thought he could see into the room
    (1c) It is easy to see through this glass
    (1d) The baby bird saw over the rim of the nest
    (1e) Using X-ray vision, Superman saw behind the tree.

We note that the set of prepositions used here is a subset of the prepositions which can be used with an ordinary verb of motion, such as *fly*, to indicate the goal of the motion. These are prepositions such as *into, onto, out of, from, through, across, over, behind,* etc. For example, *behind* is used in (1e) in the same sense as it could be used with *fly*:

    (2) The frightened bird flew behind the bush.

The meaning of *behind* here is 'to a place behind'.

Note, however, that conspicuously absent from this list of prepositions is the one which most directly indicates the goal of the motion, namely *to*. In the ordinary sense we cannot have:

    (3) * The bird saw to the nest.

Note that the paraphrase for *behind*, namely 'to a place behind', is usable in a sentence like (2) with an ordinary verb of motion:

    (4) The frightened bird flew to a place behind the bush.

But this paraphrase is not usable after *see*:

    (5) * Superman saw to a place behind the tree.

The preposition *to* is usable after *see* only in the sense of 'to as far as', indicating the distance at which objects are still visible. This ambiguity is in the

meaning of the word *to* itself. *To* may indicate distance as above, or it may indicate the physical object which is the goal of the motion, as is most common with ordinary verbs of motion. Thus we get both meanings in the sentence:

(6a) The Russians have flown to the moon.

Here the implication is either that the greatest distance to which the Russians have flown is the distance to the moon; or that the moon is a particular physical goal which the Russians have reached. (6a) is disambiguated in the following two sentences:

(6b) The Russians have flown to the moon, but no further
(6c) The Russians have flown to the moon, but nowhere else.

However, only the interpretation given in (6b) is possible when *see* is used. The sentence

(7a) Astronomers have seen to Andromeda

is not ambiguous as (6a) is. Our method of disambiguation yields an acceptable sentence in

(7b) Astronomers have seen to Andromeda, but no further

but yields a deviant sentence when we attempt to elicit a reading for *to* that indicates a particular physical goal:

(7c) * Astronomers have seen to Andromeda, but nowhere else.

Instead, we must say

(7d) Astronomers have seen Andromeda, but nothing else

without a preposition overtly expressed.

This idea of distance measure is not present when *into*, *onto*, *through*, etc. are used with *see*. The interpretation of distance measure is not a property of the verb *see*, but of the preposition *to*, and we may take all the other prepositions with *see* to be in the ordinary usage. All occur with an ordinary verb such as *fly*. In principle, the class of prepositions used after *see* is the class used for the expression of goal, including one use of *to*, but not the simpler use of *to*.

We suggest that when *see* is used transitively, as in (1a) and (7d), we have in reality the simple preposition *to* on an underlying level. The preposition *to* is omitted by some means from the ultimate surface structure. The fact that the semantic ground of (6b, 6c) is paralleled not by (7b, 7c), but by (7b, 7d), suggests that this may be so. Sentences (6b, 7b) use the preposition *to*, but while (6c) uses *to*, (7d) uses no preposition on the surface. The transitive use of *see* would neatly fill the gap for the otherwise puzzling absence of *to* in the surface string.

In other words, we envision a preposition on a non-terminal level which we will represent as TO. This underlying symbol is usually manifested as *to*, so that a sentence such as (6c) will have the tree structure shown in Fig. 1. Here S stands for 'sentence', NP stands for 'noun phrase', Det stands for 'determiner', N for 'noun', VP for 'verb phrase', V for 'verb', Aux for 'auxiliary verb', MV for 'main
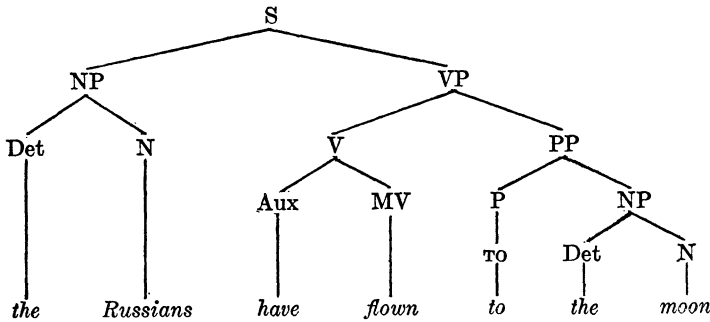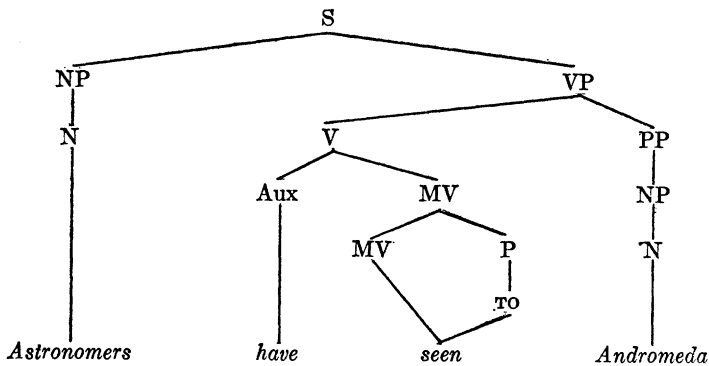
FIGURE 1

FIGURE 2

verb', PP for 'prepositional phrase', P for 'preposition', and TO for the under-lying non-terminal preposition mentioned above.

But for a verb like *see*, TO will not be manifested on the surface as *to*. Instead, TO will be partly manifested by the verb *see* itself. That is, both MV and TO will dominate the phonological specifications for *see*. The tree for (7d) would be something like Fig. 2. To arrive at this tree, a transformation affixing TO to MV has applied to a non-terminal base tree similar to that in Fig. 1 before the phono-logical specifications for *see* are inserted into the tree. This insures that *see* is ultimately a verb and not a preposition or something in between, although both a verb and a preposition dominate it.

The lexicon will consist of entries which are actually context-sensitive rules by which the phonological specifications of words, such as *see*, are attached to specific sections of the non-terminal base tree, such as MV TO. Thus we will say that *see* can be fitted onto MV TO, or that TO is incorporated into *see*. This process will be considered more fully later.

It has been postulated that the prepositions used as above for the expression of goal are all based on the preposition TO (Gruber 1965). For example, *into* is basically TO IN, and *behind*, in this usage, is TO (A PLACE) BEHIND. The TO is generally deleted in sentences such as (2), although it is sometimes in fact mani-

fested as *to* in this construction. Note that *from*, of the same category as *to*, is, in general, not deleted before other prepositions.

    (8a) John ran from below the deck
    (8b) The dog scooted from in front of the house.

The presence of *from* in the case of an expression of goal in the negative sense is reason to assume we have a *to* underlying the expression of goal in the positive sense. Moreover, sometimes the *to* is not deleted. The tendency to delete *to* is not so strong if one expression of goal follows another. The expression of goal following an expression of goal may keep the preposition *to*:

    (9) John ran from in front of the house to under the shed.

Postulating an underlying TO for the expression of goal, we can say that all prepositions based on TO are acceptable after *see* except the simple preposition *to* itself. The simple *to* is obligatorily omitted from the surface string, although it exists in the underlying structure, thereby forming the basis for the transitive use of *see*.

Let us suppose that there exists some set of non-terminal features dominated by the symbol MV. Among these features would be one which would be called Motional. This feature would characterize the ordinary verb of motion, and would specify that the prepositional phrases possible in the verb phrase after *see* (or after any verb of motion) be expressions of goal (i.e. be based on the underlying TO). This permits the full range of prepositions indicated above. We can indicate the special characteristics of the verb *see*, differentiating it from an ordinary verb of motion, by the symbol SEE. Thus the phonological matrix /see/ fits onto at least the feature complex [SEE, Motional], dominated by MV.

For the fitting of the phonological matrix /see/ into the non-terminal string, there are two distinguishable cases: the case with the simple preposition *to*, and the case with a complex preposition based on the underlying TO. Since even in
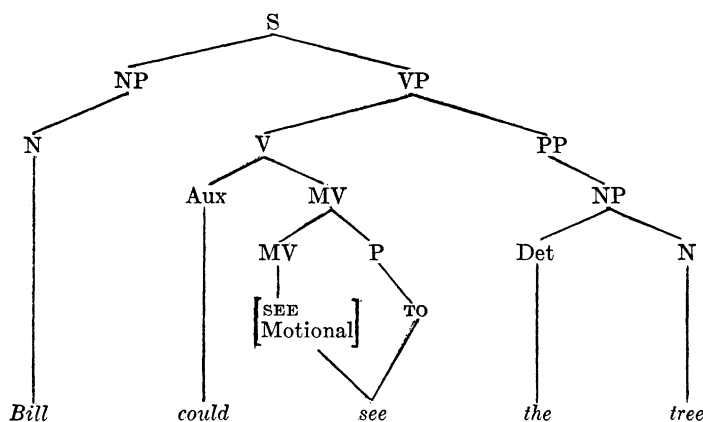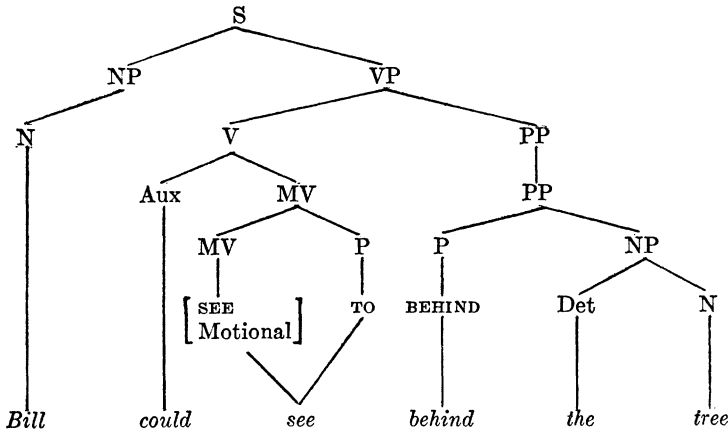

FIGURE 3

FIGURE 4

the case of the complex preposition, the preposition *to* cannot occur after *see* (recalling the impossibility of the phrase 'to a place behind' after *see*), we must say that the phonological matrix /see/ always fits onto both the feature complex dominated by MV, i.e. [SEE, Motional], and the underlying preposition TO, which follows it. In the transitive case, there is no preposition to be fitted into the string, since TO is the only underlying preposition present in the non-terminal base string in this case, and it must be incorporated into *see*. Thus, after the fitting of /see/ into the base tree, the transitive use of *see* will have a tree structure as in Fig. 3.

In the intransitive case, the underlying string contains a complex preposition, of which only the underlying TO has /see/ fitted onto it. For example, if the surface preposition is *behind*, we have an underlying TO BEHIND. The phonological matrix /behind/ fits onto BEHIND, while /see/ fits onto the sequence [SEE, Motional] TO, as usual. Compare the transitive use in Fig. 3 with the intransitive use of *see* depicted in Fig. 4. The two PP symbols, one dominating the other, are a remnant of the stage at which the underlying TO was a part of the prepositional phrase TO BEHIND NP. This phrase consists of a preposition followed by a prepositional phrase, BEHIND NP, which is derived from the noun phrase A PLACE BEHIND NP.

Thus, strange as it may seem at first, we may consider a sentence such as 'John sees a cat' to be a metaphorical extension of 'John goes to a cat'. Just so, 'John sees across the room' is similar in underlying structure to 'John goes across the room'. In some sense we might think of this as if we were saying 'John's gaze goes across the room'. If we accept as valid this paraphrase which uses an ordinary verb of motion with *across*, then we can satisfy ourselves that the paraphrase with *to*, 'John's gaze goes to the cat', is sufficiently close in meaning to 'John sees the cat' to justify the procedure semantically.

The picture is not quite complete, however. There are still a few prepositions which cannot occur after *see*, but which do occur with ordinary verbs of motion.

Some of these are *toward*, *for*, *at*, in the sense of 'run toward the tree', 'run for the milk', and 'run at the screen'. Thus we find all the following to be deviant:

(10a) * John saw toward the house
(10b) * John saw for the milk
(10c) * The bird saw at the screen.

These three prepositions (and possibly some others, e.g. *after*, *along*, *away from*, and *near*), instead of being based on the underlying TO, are based on the underlying TOWARD. Instead of indicating the goal of the motion, they indicate the direction of the motion (Gruber 1965).

These prepositions are usable after verbs such as *head* and *aim*, which do not take prepositions based on TO. Thus we can say:

(11a) John headed toward the river
(11b) John aimed at the screen
(11c) John headed for the milk.

But we cannot say:

(12a) * John aimed to the target
(12b) * John headed to the well.

The possibility of saying 'head into', 'aim across', 'aim under' etc. is due to the fact that these prepositions are ambiguously based on either TO or TOWARD. For example, *behind* can mean either 'to (a place) behind' or 'toward (a place) behind'. *Into* will have either the underlying form TO IN or TOWARD IN.

We can exclude such prepositions from occurring after *see* by demanding that all its prepositions be based on TO rather than TOWARD.

There is, however, a particular verb in English which is complementary to *see* in this respect, with prepositions based on TOWARD instead of on TO. This is the verb *look*. Syntactically, *look* acts like *head* and *aim*. Thus we have such expressions as 'look toward the tree', 'look for the milk', and 'look at the screen'. But here also we cannot have *to* (in most dialects):

(13) * John looked to the tree.

But, just as for *head* and *aim*, this gap cannot be filled by saying that TO exists at an underlying level and is later omitted, since *look* cannot be used transitively as *see* can:

(14a) * John headed the well
(14b) * John looked the tree.

Rather, the explanation for the absence of *to* here is the requirement that for *look*, *head*, and *aim*, all the prepositions be based on TOWARD, not on TO. The possibility of saying 'look into', 'look across', etc., is again due to the fact that these prepositions are ambiguously based on either TO or TOWARD.

The semantic distinction between *see* and *look* is largely due to the distinction in the underlying prepositions demanded by them. Thus, one can look at something without seeing it, just as one can run at something without having run to

it. Similarly, it is reasonable to say 'John opened the door and looked into the room, but it was so dark that he couldn't see into it at all'. Here we have the distinction between the two *into*'s: for *look* we have TOWARD IN, and for *see* we have TO IN, on a non-terminal level.

We may now extend the use of the symbol [SEE, Motional] to abbreviate the set of features which specify the verb *look*, as well as *see*. Both *look* and *see* are fitted onto the underlying [SEE, Motional], the one demanding prepositions based on TOWARD, the other based on TO. Compare a paradigm composed of some uses of both *see* and *look* with one for an ordinary verb of motion, such as *fly*:

(15a) The bird flew toward the tree
(15a') The bird looked toward the tree
(15b) The bird has flown to the nest
(15b') The bird has seen the nest
(15c) The bird was flying at the screen
(15c') The bird was looking at the screen
(15d) The bird is flying for the fish
(15d') The bird is looking for the fish
(15e) The bird was flying into its nest
(15e') The bird was looking into its nest
(15f) The bird hasn't flown into its nest yet
(15f') The bird hasn't seen into its nest yet.

Look and *see* are further differentiated by the fact that the former is obligatorily Agentive, whereas the latter is obligatorily not (Gruber 1965). An Agentive verb is one whose subject refers to an animate object which is thought of as the willful source or agent of the activity described in the sentence. There are certain criteria which distinguish an Agentive verb from a non-Agentive one. Thus *look* is in all circumstances substitutable by the phrase *do something*, as are all Agentive verbs; it can be modified by a purpose phrase beginning with *in order to*; and it may have those manner adverbials, such as *carefully*, which go only with Agentive verbs. However, *see* is obligatorily non-Agentive, and opposes all these criteria:

(16a) John looked through the glass carefully
(16b) * John saw through the glass carefully
(17a) What John did was to look at Bill
(17b) * What John did was to see Bill
(18a) John looked into the room in order to learn who was there
(18b) * John saw into the room in order to learn who was there.

Here then is another way in which *see* is diametrically opposed to *look*: *look* is Agentive and takes prepositions based on TOWARD; *see* is non-Agentive and takes prepositions based on TO.

The lexicon, as has been said, consists of context-sensitive rules fitting phonological matrices onto non-terminal symbols. While the phrase structure component will have the potentiality of generating the set of non-terminal base strings,

consisting of all possible prepositional complements of a verb of motion, it will be possible to fit only an ordinary verb of motion, such as *fly*, into any string of this set. This is the general and unmarked condition, so that *fly*, for example, is fitted without restriction onto the feature complex [Motional]. For other verbs, however, it will be possible to fit them into the strings of only a subset of all possible base strings for a verb of motion. The rules by which the verbs are mapped into the base string must therefore be context-sensitive. For example, *head* will be specified as fittable only into strings which contain a preposition based on TOWARD.

Look and *see* will be treated syntactically as verbs of motion. For *look*, the rule which fits its phonological form into the non-terminal base string must specify that it be fitted into a string with a preposition based on TOWARD. Conversely, for *see* the rule must specify that it be fitted into a non-terminal base containing a preposition based on TO. In addition *see* is non-Agentive and *look* is Agentive, so that we have respectively:

Rule 1.   /see/ in environment $\begin{bmatrix} \text{non-Agentive} \\ \text{SEE} \\ \text{Motional} \\ \underline{} \end{bmatrix}$ TO

Rule 2.   /look/ in environment $\begin{bmatrix} \text{Agentive} \\ \text{SEE} \\ \text{Motional} \\ \underline{} \end{bmatrix}$ TOWARD

These rules assert that the phonological matrices indicated between the diagonals (/), for *see* and *look*, may be fitted into a string of non-terminal symbols at the position marked by the horizontal line. The features above the line are features of the verb. These must be present at the position onto which the phonological matrices are fitted. The environment into which these phonological matrices must be fitted to the right or to the left is indicated by writing the features that must be present there to the right or to the left of the horizontal line, respectively. Consequently we have indicated that the underlying TO or TOWARD must be present to the right. That is, the prepositional complement must be based on TO with *see* and on TOWARD after *look*.

In order to indicate that *to* never appears on the surface for *see*, let us draw a horizontal line under TO. This will imply that TO is a part of the position onto which *see* is fitted, and not just a part of the peripheral environment. It may also be understood to effect the affixing transformation whereby TO becomes dominated by MV, if this transformation has no independent motivation. This formalism will state that TO is always incorporated into *see*. It also means that TO is obligatorily in the environment of *see*, i.e. in the simultaneous environment of *see*. For complex expressions of goal, such as *behind* (= 'to a place behind'), there is an underlying TO, which, in this case, is incorporated into *see* instead of being deleted. The trees resulting from the insertion of *see* are exemplified in Fig. 3 and Fig. 4, already given.

Accordingly, we modify the insertion rule for *see*, Rule 1, as follows:

Rule 3. /see/ in environment $\begin{bmatrix} \text{non-Agentive} \\ \text{SEE} \\ \text{Motional} \\ \underline{\quad} \end{bmatrix} \underline{\text{TO}}$

We can combine Rules 2 and 3 into a single compound rule, using braces as follows:

Rule 4. $\begin{Bmatrix} \text{/see/ in env} \begin{bmatrix} \text{non-Agentive} \\ \underline{\quad} \end{bmatrix} \underline{\text{TO}} \\ \text{/look/ in env} \begin{bmatrix} \text{Agentive} \\ \underline{\quad} \end{bmatrix} \text{TOWARD} \end{Bmatrix} \text{in env} \begin{bmatrix} \text{Motional} \\ \text{SEE} \\ \underline{\quad} \end{bmatrix}$

Rule 4 implies all of the foregoing description of these verbs.

Further corroboration that these rules are correct for *look* and *see* is possible. The underlying TO in *see* is supported by the aspectual behavior of *see*. In all the above uses of *see*, the progressive is in general not possible:

(19a) * John is seeing the tree
(19b) * John is seeing into the room.

Note that for an ordinary verb of motion without a prepositional complement, the progressive is possible:

(20) The rock is sliding.

However, the progressive is not possible if we have a prepositional complement in TO:

(21) * The rock is sliding to the wall.

This is not possible if the *to* is read as TO, not TOWARD. The aspect of continuous activity is not compatible with the finite aspect of arriving at a goal, as is implied with TO. With TOWARD, however, the progressive is quite possible:

(22) The rock is sliding toward the wall.

The progressive is possible if the verb is Agentive, even with TO. For example, we can have the progressive in:

(23) John is running to the river

implying intention or will on the part of John. In this sense, John is engaged in the process of carrying out his intention which is to go *to* the river. Hence, *to* here means TO, yet the activity is a continuous one. However, if *see* obligatorily has TO and is obligatorily non-Agentive, then it cannot have the progressive. And this correlates with the facts.

Look, as shown before, is complementary to *see* in this respect, requiring both the feature Agentive and the underlying preposition TOWARD. Thus we can readily say:

(24) John is looking toward the tree.

Another instance in which the progressive is possible, regardless of the preposition, is when some iterative aspect is added to the sentence. This can be accomplished by having plural nouns in the sentence. Hence we can have:

(25a) The rocks are sliding to the points of maximum stability
(25b) The ball has been rolling to that tree several times a day.

Similarly, we can have the progressive for *see* when an iterative sense is implied:

(26a) John is seeing spots
(26b) John has been seeing that vision several times a day.

It appears that the conditions under which the progressive can be used depend on the possibility of having certain semantic interpretations for the sentence. This in turn depends to a large extent on the syntax, provided we refer to nonterminal nodes in the sense here described. In fact, it may be possible to avoid the necessity to use a feature such as Active vs. Stative to refer to a verb's susceptibility to the progressive (Lakoff 1965). As seen, the progressive possibility depends to a large extent on the structure of the sentence as a whole, not only on the verb. The underlying structures here postulated for *see* and *look* seem to conform with the expectations for the progressive observed when these underlying structures are overtly expressed.

On a similar basis, one can characterize the environment in which the time preposition *until* appears. For verbs which express relationships of position, *until* is possible if the verb is non-Motional, i.e. if it can have a verb phrase locative.

(27a) The bird was in its cage until 5 o'clock
(27b) The bird sat on the limb until 5 o'clock.

Since it is not possible to have *until* with *see*, perhaps we do not have a non-Motional verb here:

(28) * The bird saw the limb until 5 o'clock.

With Motional verbs, *until* is generally also possible, however. How then can we allow *see* to be Motional? Note that it is with prepositions based on TO that, even for Motional verbs, *until* is not permitted:

(29a) The bird flew about until 5 o'clock
(29b) The bird flew toward the tree until 5 o'clock
(29c) * The bird flew to the tree until 5 o'clock.

Sentence (29c) is not possible unless the *to* is interpreted as TOWARD.

A negative constituent in a sentence in which *until* is not otherwise permitted causes *until* to be permissible. Thus we can say:

(30) The bird didn't fly to the tree until 5 o'clock.

Indeed, the same situation is obtained with *see*, with which *until* is possible if we have a sentence negation:

(31) John didn't see the house until 5 o'clock.

As expected, since *look* has prepositions based on TOWARD and not TO, *until* is always permitted:

    (32) John looked at the house until 5 o'clock.

Hence the environment in which *until* can be used is specifiable in terms of syntactic structures in the non-terminal string, corroborating our hypothesis for the non-terminal string underlying *see*.

For other treatments of these verbs in terms of verbal classification, Ryle 1962, Sibley 1955, and Vendler 1957 may be of interest.

The grammatical description of the verbs *look* and *see* in our present paper rests upon the assumption that certain classes of features are generated in the base component independent of particular words present in the language. The set of non-terminal base strings generated in a language is the set of all possible constructions which are systematically made up of the basic symbolic building blocks in that language. These building blocks, and the system to which they belong, are, one hopes, to a large extent universal. According to this view, a particular word in a language is used in expressing a limited subset of the strings generated in the base component. The syntactic and semantic behavior of a specific word can be attributed largely to the systematic nature of the base component, and to the subset of the base component which the specific word can be used to represent.[1]

REFERENCES

CHOMSKY, NOAM. 1965. Aspects of the theory of syntax. Cambridge, Mass., MIT Press.
GRUBER, JEFFREY S. 1965. Studies in lexical relations. Cambridge, Mass., MIT dissertation.
LAKOFF, GEORGE. 1965. On the nature of syntactic irregularity. Cambridge, Mass., Harvard University, Computation Laboratory, Report No. NSF-16.
RYLE, GILBERT. 1962. The concept of mind. 4th ed. New York.
SIBLEY, F. N. 1955. Seeking, scrutinizing, and seeing. Mind 44.455–77.
VENDLER, ZENO. 1957. Verbs and times. Philosophical Review 66.143–60.