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THE TIME-AXIS PHENOMENON

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It is shown that presuppositions and implications associated with verbs distribute themselves relative to the TIME-AXIS (action-time) of the verb. Presuppositions pertain to the time preceding this time-axis, while implications pertain to the time following the time-axis. The semantics of two universal verb classes, MODALITY verbs (M-verbs) and COGNITION verbs (C-verbs), is analysed in light of these findings.

Two widespread diachronic processes of sense extension are studied. One involves the development of sentence modalities from M-verbs. It is shown that a great amount of predictability exists in this process, and that the type of tense-aspect marker likely to arise from an M-verb may be inferred, with great accuracy, from the specific presuppositional and implicational structure of the precursor verb. A considerable degree of predictability is also shown in the development of M-verb senses from C-verbs. It is suggested that our temporal and aspectual notions, including our notions of time, negation, certainty, and possibility, are already present in the semantic structure of verbs. Diachronic extensions of verb-senses merely serve to illuminate this.¹

1. INTRODUCTION. This paper deals primarily with the semantic structure of two classes of complement-taking verbs: COGNITION verbs (C-verbs), such as *know*, *pretend*, *believe* etc., and MODALITY verbs (M-verbs), such as *manage*, *fail*, *plan* etc. More specifically, it will deal with two semantic properties which characterize the relationship between these verbs and their sentential complements: IMPLICATION and PRESUPPOSITION. In earlier characterizations of the semantics of both verb groups, it has been tacitly assumed that presupposition pertained to C-verbs (see Kiparsky & Kiparsky 1968, Karttunen 1971a) and the notion of implication to M-verbs (Karttunen 1971a). In the first part of this paper I will show that these assumptions must be revised; both presuppositions and implications are involved, in either verb class, in characterizing the truth relationship between the main verb and the complement sentence. For verbs of either class, further, the presuppositions (or at least some of them) and implications associated with the verb do NOT pertain to the same time period. Rather, the presuppositions pertain to the time PRECEDING the time of the act, while the implications pertain to the time FOLLOWING it. This critical time, with respect to which the presuppositions and implications associated with the verb are distinguished, will be called the TIME-AXIS of the verb. For active verbs it corresponds to the time given in the time-adverbial phrase that is (optionally) associated with the verb.

¹ A preliminary paper on this subject, read at the Mid-Summer Linguistics Conference, University of California, Santa Cruz, July 1971, was published as Givón 1972a. I am indebted to Georgette Silva for a casual conversation which stimulated my interest in this subject. I am also indebted to Lauri Karttunen, Larry Horn, Sandy Thompson, Andy Rogers, and James McCawley for valuable comments on earlier drafts. The opinions expressed below remain strictly my own.

Further, I will show that this time-axis distribution of presuppositions and implications is not limited to C-verbs and M-verbs only, but is a widespread phenomenon, characterizing the relationship between the presuppositions (or at least some of them) and implications of many other verb types, some of which do not take overt sentential complements.

The two verb classes primarily to be discussed below are of unique interest to the linguist, psychologist, and anthropologist. Both predicate, almost exclusively, human-agentive nouns. Thus, C-verbs cover most verb-senses of cognition, knowledge, perception, belief, or feeling, while M-verbs cover most verb-senses of volition and intent, as well as a small group of senses which pertain to the inception and termination of acts. Both classes appear to be universal in two ways: first, every language has them; second, the verb-membership of both classes shows an extremely high degree of cross-language correspondence. Further, both classes exhibit highly persistent—and again seemingly universal—tendencies of *SENSE DEVELOPMENT*. Many verbs, in one language after another, belong to both classes. Modality verbs, in a seemingly universal fashion, give rise to *SENTENTIAL MODALITY* morphemes or senses. These pervasive patterns of polysemy often involve subtle changes in the presuppositions and implications associated with the verb, and need not be dismissed as mere diachronic phenomena. It often turns out that diachronic changes in meaning ('sense shifts', 'sense development') are of great value for validating claims about synchronic semantic structure. Indeed, a semantic theory could hardly be considered adequate unless it characterized, ultimately, the notion of *POSSIBLE SEMANTIC CHANGE*. While the diachronic sections of this paper are only tentative, an attempt is made to suggest some possible constraints on semantic change in C-verbs and M-verbs.

1.1. PRESUPPOSITIONS AND C-VERBS. C-verbs will be here defined as verbs taking a sentential complement, in English normally subordinated by *that*, where no equi-subject requirement holds between the main and subordinate verb. As noted by the Kiparskys, most of the 'factive' verbs of this group, i.e. those which presuppose the truth of their complement sentence, may take the complementizing noun *fact*, as in:

- (1) I regret the fact that she was hurt.
- (2) *I believe the fact that she was hurt.

The Kiparskys have pointed out that this syntactic fact corresponds with the semantic property of *PRESUPPOSITION*. Presupposition is a relation between two propositions, defined here (after Karttunen 1971a) in the following way:

- (3) P presupposes Q just in case $T(P) \supset T(Q)$ and $F(P) \supset T(Q)$.

Here P, Q are propositions, $T(x)$ stands for '*x* is true', and $F(x)$ stands for '*x* is false'. That is, P presupposes Q just in case Q is true whenever P has a truth value. As Karttunen 1971a points out, linguists often treat this notion less formally, roughly subscribing to this definition:

- (4) If P presupposes Q, then Q is believed true by the speaker when he either asserts or denies P.

Thus 5a presupposes 5b, since *regret* is a factive verb, but 6a does not presuppose 6b, since *believe* is a non-factive verb:²

- (5) (a) I regret that she was hurt > (b) She was hurt.
 (6) (a) I believe that she was hurt *> (b) She was hurt.

This is evident from the oddity of 7 as compared with 8:

- (7) *John regretted that she was hurt, though in fact she wasn't.
 (8) John believed that she was hurt, though in fact she wasn't.

Throughout this paper I will use the term FACTIVE for C-verbs such as *regret* which presuppose the truth of their complement sentences. I will use the term NON-FACTIVE for C-verbs such as *believe* which do not presuppose the truth of their complement sentences. Finally, I will use the term NEG-FACTIVE for C-verbs such as *pretend*, which presuppose the falsity of their complement sentences, as in

- (9) John pretended that she was hurt > She wasn't hurt.

Thus both factive and neg-factive verbs have presuppositions, so that both the assertion and the negation of the main verb must yield the same truth value of the complement sentence, as evidenced by the oddity of all these sentences:

- (10) *Sheila wasn't hurt and John regretted that she was.
 *Sheila wasn't hurt and John didn't regret that she was.
 *Sheila was hurt and John pretended that she was.
 *Sheila was hurt and John didn't pretend that she was.

Next note that the verb-phrase negation in English (as well as most other languages) is ambiguous with respect to whether it is INTERNAL or EXTERNAL (for a concise discussion, see Herzberger 1971). Internal negation of a proposition denies the assertion without denying the presuppositions. E.g., 11 has two readings—12, which is an internal negation, and 13, which is external:

- (11) Socrates is not bald.
 (12) Socrates exists and he is not bald.
 (13) It is not true that Socrates is bald.

In 12, *Socrates exists* is presupposed, and *He is not bald* is asserted. The external negation in 13 may arise either from 12 or, alternatively, from the failure of the presupposition *Socrates exists*—in which case the sentence *Socrates is bald* fails for lack of denotation. Now this is extremely germane to the linguist's discussion of factive and neg-factive verbs, because the test environment involved is negation—and the test environment holds only if it is construed as INTERNAL negation. Thus 14 is ambiguous and may have the reading of either 15 or 16, and the failure-of-presupposition sense of 16 is easily demonstrated in 17:

- (14) John did not know that Sheila was hurt.
 (15) Sheila was hurt, and John did not know that she was. (internal)
 (16) It is not true that John knew that Sheila was hurt. (external)
 (17) Of course John did not know that Sheila was hurt, because she wasn't, so he couldn't have known it.

² Throughout this paper the following notation will be used: > 'presupposes', * > 'does not presuppose', \supset 'implies', * \supset 'does not imply'.

This is of course quite obvious, given the failure-of-presupposition use of external negation. It is therefore natural for verbs to lose their presuppositions precisely in this type of environment.

The C-verbs to be discussed in this paper are divided into three sub-groups (factive, neg-factive, non-factive) as follows:

(18) FACTIVE: *know, remember, forget, see, hear,*³ *guess, resent, suspect, understand, be happy, regret, be aware, learn,*⁴ *realize, discover, notice, find out.*

NEG-FACTIVE: *pretend.*⁵

NON-FACTIVE: *decide, agree, hope, be afraid, think, doubt, be sure, believe, feel, fear, assume, suppose, dream, imagine.*⁶

³ The verbs *hear, guess, and suspect* show a number of baffling peculiarities. They seem to imply the truth of their complements ONLY if put in the negative: thus *John didn't hear that Sheila was hurt* > *Sheila was hurt*, but *John heard that Sheila was hurt* * > *Sheila was hurt*. They thus seem to correspond to *be able, be in the position, and have the opportunity*, which are classified by Karttunen 1971a as 'only-if' verbs. However, under a different intonation pattern, *hear* changes its presuppositional properties: thus *John HEARD that Sheila was hurt* > *Sheila was hurt*. Another environment in which *hear* gains presuppositions is yes-no questions: thus *Did John hear that Sheila was hurt?* > *Sheila was hurt*; *Didn't John hear that Sheila was hurt?* > *Sheila was hurt*. This may well be obliterated under another stress pattern, which presumably introduces a new set of presuppositions: thus: *Did John hear that Sheila was HURT?* * > *Sheila was hurt*. The presuppositional properties of semantic/syntactic environments may easily influence the properties of verbs which 'tend sometimes to be presuppositional'; for more examples, see Karttunen 1971b.

⁴ Karttunen 1971b notes that in a number of environments, e.g. in the if-clause of conditionals or under the sentential modality *it is possible that*, verbs of coming-to-know (*learn, realize, discover, find out, notice*) lose their presuppositional character. This contrasts with verbs such as *regret* which do not. Thus the sentence *It is possible that I will discover later that I was wrong* does not commit the speaker to the truth of *I was wrong*, but the sentence *It is possible that I will regret later that I was wrong* does. Karttunen has termed such verbs 'semi-factive'.

⁵ Neubauer 1971 raises doubt concerning the neg-factive status of *pretend*, showing that in several usages it has no presupposition with respect to the truth of the complement sentence. The problem of suspension of presuppositions of verbs under specific environments is very involved. E.g., one could show that verbs such as *know* and *remember* have non-presuppositional uses, as in *Mary didn't remember that anyone came*. Note that the following sentence seems quite acceptable: *No one came, and Mary didn't remember that anyone did*. The use of the article *any* in the complement sentence is possible PRECISELY because the truth of the complement is not presupposed. When *fact* forces back the presupposition of *remember*, one obtains the unacceptable **Mary didn't remember the fact that anyone came*. Similar usages may be shown for *know* and probably for all factive verbs. This does not necessarily suggest that these verbs are not factive, but only that we know very little about the semantic/grammatical environments which control the possible loss of presuppositions of verbs. It may well be that verbs are 'factive' only in a certain range of environments, and may also differ from each other with respect to the exact range of those environments.

⁶ The status of *imagine* and *dream* is somewhat controversial. In many instances they seem to be used as neg-factives: thus *John imagined that Sheila was with him* and *John did not imagine that Sheila was with him* both seem to imply (the second one only when interpreted as an INTERNAL negation) *Sheila was with him*. On the other hand, it is quite easy to construct a counter-example such as *John closed his eyes and imagined that Sheila was with him, then opened them and there she was*. However, it seems to me that in some rather subtle

Finally, the presuppositions discussed thus far are not relevant to the time-axis phenomenon, since they are 'timeless'. As will be shown below, C-verbs often possess another type of presupposition, which is relevant to the time-axis of the verb—i.e., which pertains to the time preceding that time-axis.

1.2. IMPLICATIONS AND M-VERBS. For the purpose of this paper, M-verbs will be defined as verbs requiring a sentential complement and, in addition, requiring an equi-subject condition between the main and complement verb. Some of these verbs are said to be **IMPLICATIVE**. An implicative verb implies the truth of its complement sentence; or, as Karttunen 1971a puts it:

$$(19) v(S) \supset (S)$$

In addition, the negation of an implicative verb implies the negation of its complement sentence; cf. the examples in 21:

$$(20) \sim v(S) \supset \sim(S)$$

$$(21) \text{John managed to kiss Mary} \supset \text{John kissed Mary.}$$

$$\text{John didn't manage to kiss Mary} \supset \text{John didn't kiss Mary.}$$

Karttunen 1971a also argues that the sense of 'imply' here is weaker than the usual logical notion, since **MODUS TOLLENS** does not apply. That is, 22 is not a correct meaning postulate for implicative verbs:

$$(22) \sim(S) \supset \sim v(S)$$

For an example (taken from Karttunen 1971a), 23a does not imply 23b:

$$(23) \text{a. John didn't kiss Mary.}$$

$$\text{b. John didn't manage to kiss Mary.}$$

It seems to me that a misunderstanding is involved which can be traced to the **PRESUPPOSITIONS** of *manage*. To begin with modus tollens does hold in a very strict sense here, since if 24a is false, 24b must also be false:

$$(24) \text{a. John kissed Mary.}$$

$$\text{b. John managed to kiss Mary.}$$

sense, the imagined or dreamed world does not pertain to the **SAME** situation or event which later turns out to be true, but only to a **SIMILAR** situation. This may be shown by giving different times to the main and complement sentence: consider *At two o'clock John closed his eyes and imagined that Sheila was with him the night before*. The sentence sounds rather odd, as does *At two o'clock John closed his eyes and imagined that Sheila would be with him the next evening*. The oddity stems from the fact that a dreamed or imagined world is dreamed or imagined **AS PRESENT**. This is evident from the slightly modified sentences: *At two o'clock John closed his eyes and imagined that it was the preceding night and Sheila was with him*; *At two o'clock John closed his eyes and imagined that it was the following evening and Sheila was with him*. Further, note that the sentence *Sheila was with John the preceding night, and the following morning he closed his eyes and imagined that she was with him that night* is odd in the extreme; but if it had been completed instead with ... *and the following morning he closed his eyes and imagined that she was with him RIGHT THERE AND THEN*, it would become perfectly acceptable. Thus the speaker may embed the dream, with phrases such as *he imagined that it was last night*, in some past time, but the dreamer or imaginer experiences the **HERE-AND-NOW**. But many presupposed true propositions are about the past or future, so the sentential complements of *dream* or *imagine* cannot be identical with those. They must be **FALSE BY DEFINITION**.

Now *manage*, in one of its senses (see discussion below), presupposes attempt. The internal-negation reading of 23b may thus be paraphrased as:

- (25) PRESUPPOSED: John deliberately tried to kiss Mary.
 ASSERTED: John did not kiss Mary.

The asserted part of 23b thus seems to be implied by 23a. While at the moment I see no clear resolution to this problem, for the purpose of this paper I will assume that meaning postulate 22, and thus modus tollens, does hold for implicative verbs; thus, if their complement is taken to be false, the entire sentence is also taken to be false.

Some M-verbs are NEG-IMPLICATIVE; i.e., they imply the falsity of their complement sentences. E.g.,

- (26) John forgot to wash the dishes \supset John did not wash the dishes.

These verbs, as Karttunen 1971a points out, abide by the meaning postulate

- (27) $v(S) \supset \sim(S)$

The negation of a neg-implicative verb, on the other hand, implies the truth of its complement, as illustrated in 29:

- (28) $\sim v(S) \supset (S)$

- (29) John didn't forget to wash the dishes \supset John washed the dishes.

Karttunen 1971a points out that this may be handled by assuming that neg-implicative verbs have an incorporated negative in their structure. Thus,

- (30) *fail* \equiv *not-succeed*
forget \equiv *not-remember*

In addition, I would like to claim, these verbs also abide by modus tollens, so that if 31a is false, so is 31b:

- (31) a. John did not wash the dishes.
 b. John failed to wash the dishes.

In other words, if the complement sentence is true, the neg-implicative verb must be false, or

- (32) $(S) \supset \sim v(S)$

It can be easily shown that meaning postulates 27, 28, and 32 may be derived from meaning postulates 19, 20, and 22, respectively, by assuming that a neg-implicative verb is the negative of an implicative verb.

Finally, many M-verbs are NON-IMPLICATIVE, so that they imply neither the truth nor the falsity of their complements. E.g.,

- (33) John wanted to kiss Mary $*\supset$ John kissed Mary.
 John didn't want to kiss Mary $*\supset$ John didn't kiss Mary.
 $\sim(\text{John kissed Mary})$ $*\supset \sim(\text{John wanted to kiss Mary}).$

The M-verbs to be considered in this paper are listed in 34, divided into the three groups discussed above. Some of them, such as *finish*, *stop*, and *complete*, are ordinarily considered implicative, but are listed here as neg-implicative. As will be shown, their presuppositions, rather than implications, render them susceptible to this kind of confusion; the former pertain to a time prior to the time-axis, the latter to a time following the time-axis.

- (34) **IMPLICATIVE:** *begin, continue, resume, repeat,*⁷ *manage, succeed, remember, condescend.*
NEG-IMPLICATIVE: *finish, stop, avoid, neglect, escape, fail, forget, refuse, decline,*⁸ *complete.*
NON-IMPLICATIVE: *want, plan, try, hope, decide, prefer, agree, be afraid, hate, dread, intend.*

2. **THE TIME-AXIS PHENOMENON.** In this section I will introduce the time-axis phenomenon, first by discussing a small group of M-verbs, referring to inception, termination, continuation, or resumption/repetition. Following Karttunen 1971a, I have listed them above as implicative (or neg-implicative). What I will try to show below is that, in addition to their implications, which pertain to the time following the time-axis of the verb, these verbs also have presuppositions with respect to the truth of their complement sentence; and those presuppositions, in turn, pertain to a time PRECEDING the time-axis. A small sub-group of verbs (*succeed, manage, and fail*) involve additional semantic material, and will be treated under a separate heading. A group of **ACHIEVEMENT** verbs, including *succeed, manage, finish, and complete*, will also require additional discussion.

Let us first consider the implications associated with our time-axis verbs:⁹

- (35) a. At 2 p.m. John began to work \supset
 At a time DIRECTLY AFTER 2 p.m. John was working.
 At 2 p.m. John did not begin to work $*\supset$
 At a time DIRECTLY AFTER 2 p.m. John was not working.
 At a time DIRECTLY AFTER 2 p.m. John was not working \supset
 John did not begin to work at 2 p.m.
 b. It was 2 p.m. and John continued to sleep¹⁰ \supset
 At a time DIRECTLY AFTER 2 p.m. John was asleep.
 It was 2 p.m. and John did not continue to sleep $*\supset$
 At a time DIRECTLY AFTER 2 p.m. John was not asleep.
 At a time DIRECTLY AFTER 2 p.m. John was not asleep \supset
 ~(John continued to sleep at 2 p.m.).
 c. At 2 p.m. John again entered the room \supset
 At a time DIRECTLY AFTER 2 p.m. John was inside the room.

⁷ The verb *repeat* in English takes only nominalized complements, as in *He repeated his request*, but not **He repeated to request* or **He repeated requesting*. Semantically, however, it should be treated in this group. For the purpose of the discussion below, I will simply assume that this verb may be correctly paraphrased by use of the adverbial *again*, as in *He again requested*.

⁸ Both *refuse* and *decline* seem to behave as neg-implicative in many ordinary usages; but when one forces the issue, they quite often lose their (neg)-implicative character, becoming (neg)-intentional (negative non-implicative) verbs. One may perhaps say that these verbs 'invite the inference' of (neg)-implication.

⁹ In sentences followed by an asterisk, only the INTERNAL negation sense is considered, i.e. the one in which the assertion is negated but the presuppositions are not.

¹⁰ The verb *continue* (and probably some others) cannot always take *at* time adverbials, and this is particularly true with their negatives. The time-axis of the verb need not be introduced by an overt time-adverb. Any phrase which may establish it by inference will do—e.g. *it was ... and*. The important thing is that the time introduced in the time-phrase is that of the M-verb.

- At 2 p.m. John did not again enter the room * \supset
 At a time DIRECTLY AFTER 2 p.m. John was not in the room.
 At a time DIRECTLY AFTER 2 p.m. John was not in the room \supset
 \sim (At 2 p.m. John again entered the room).
 d. At 2 p.m. John resumed his work \supset
 At a time DIRECTLY AFTER 2 p.m. John was working.
 At 2 p.m. John did not resume his work * \supset
 At a time DIRECTLY AFTER 2 p.m. John was not working.
 At a time DIRECTLY AFTER 2 p.m. John was not working \supset
 \sim (At 2 p.m. John resumed his work).

The verbs here are all (positive) implicative verbs. They all abide by the appropriate meaning postulates 19, 20, and 22. In 36 it is shown that, given the criteria established above, the verbs *finish*, *stop*, and *complete* are neg-implicative:

- (36) a. At 2 p.m. John finished working \supset
 At a time DIRECTLY AFTER 2 p.m. John was not working.
 It was 2 p.m. and John did not finish working \supset
 At a time DIRECTLY AFTER 2 p.m. John was working.
 At a time DIRECTLY AFTER 2 p.m. John was working \supset
 \sim (At 2 p.m. John finished working).
 b. At 2 p.m. John stopped working \supset
 At a time DIRECTLY AFTER 2 p.m. John was not working.
 It was 2 p.m. and John did not stop working \supset
 At a time DIRECTLY AFTER 2 p.m. John was working.
 At a time DIRECTLY AFTER 2 p.m. John was working \supset
 \sim (At 2 p.m. John stopped working).
 c. At 2 p.m. John completed his homework \supset
 At a time DIRECTLY AFTER 2 p.m. John had no more homework left to do.
 It was 2 p.m. and John had not completed his homework \supset
 At a time DIRECTLY AFTER 2 p.m. John still had some homework to do.
 At the time DIRECTLY AFTER 2 p.m. John still had some homework to do \supset
 \sim (At 2 p.m. John completed his homework).

In reference to the time following the time-axis, then, these verbs abide by the meaning postulates 27, 28, and 32 which characterize neg-implicative verbs.

Let us now turn to consider the presuppositions involved with these verbs. In terms of their presuppositions, which relate to the truth of the complement sentence at a time prior to the time-axis,¹¹ the verbs under discussion group

¹¹ There is a crucial sense in which 'truth of the complement sentence' must have a different meaning here than when one discusses the 'timeless' presupposition of factive verbs such as *know* or *forget*. Consider the sentence *John began to work*: it implies *John worked AFTER beginning to*, and presupposes *John was not working BEFORE beginning to*. Strictly speaking, then, the implication and presupposition do not refer to the same proposition/event, since if time is taken into account, the two events do not have the same denotation. The 'same' complement sentence is thus 'same' in terms of SENSE, but not in terms of REFERENCE. Consider, however, *John discovered that Sheila left town Friday*: the presupposed

differently. *Continue, resume, repeat, finish, stop, and complete* all have positive presuppositions. This is evident from the infelicity of the sentences below:

- (37) *John had never worked and then he continued to work.
 *John had never worked and then he didn't continue to work.
 *John had never worked and then he resumed his work.
 *John had never worked and then he didn't resume his work.
 *John had never worked and then he worked again.
 *John had never worked and he never worked again.
 *John wasn't working and then he stopped working.
 *John wasn't working and he didn't stop working.
 *John wasn't working and then he finished working.
 *John wasn't working and he didn't finish working.
 *John had no more homework to do and then he completed it.
 *John had no more homework to do and then he didn't complete it.

In contrast, *begin (start)* has negative presuppositions with respect to the truth of the complement sentence at a time prior to the time-axis. This is evident from the infelicity of

- (38) *John was kissing Sheila and then he began to kiss her.
 *John was kissing Sheila and then he didn't begin to kiss her.
 *John began to kiss Sheila though he was already kissing her.
 *John didn't begin to kiss Sheila and he was already kissing her.¹²

The presuppositions and implications of these verbs are summarized in Table 1.

| VERB | (truth of complement prior to time-axis) | (truth of complement following time-axis) |
|---------------------|--|---|
| | PRESUPPOSITION | IMPLICATION |
| <i>stop, finish</i> | + | - |
| <i>begin, start</i> | - | + |
| <i>continue</i> | + | + |
| <i>resume</i> | + (then -) | + |
| <i>repeat</i> | + (then -) | + |

TABLE 1

2.1. THE SEMANTICS OF SUCCESS AND FAILURE. In this section I will show that verbs such as *succeed, manage, and fail* show the same time-axis phenomenon as the verbs discussed above, though in addition they carry several other semantic features. To begin with, these verbs show a systematic ambiguity: one sense is predicative of the subject noun, while another is predicative of the sentence itself, as a MODALITY of either affirmation (*succeed, manage*) or negation (*fail*). In 39, senses (a, c, d) are of mere negation or affirmation, while senses (b, d, f) presuppose active attempt:

- (39) a. (We waited, but) he failed to arrive = He did not arrive.
 b. He failed to solve the problem = He tried but failed.

proposition *Sheila left town Friday*, and the asserted proposition *Sheila left town Friday* which John has acquired knowledge of, are not only identical in sense but also in reference.

¹² A concatenation of this kind will be acceptable if the negation is interpreted as external negation, as in *John didn't begin to kiss Sheila then, because he was already kissing her*.

- c. He succeeded in botching up his affairs = He botched up his affairs. (irony)
- d. He succeeded in solving the problem = He tried and succeeded.
- e. He managed to get killed in action = He got killed in action. (irony)
- f. He managed to swim ashore = He tried and succeeded.

In these examples, both senses of the verb share the IMPLICATION, either positive or negative, with respect to the truth of the complement sentence AFTER the time-axis of the verb:

- (40) Yesterday he succeeded in getting killed \supset
 AS OF YESTERDAY he is dead.
 Yesterday he succeeded in solving the problem \supset
 AS OF YESTERDAY the problem is solved.
 At 2 p.m. he failed to show up \supset
 DIRECTLY AFTER 2 p.m. he wasn't there.
 It was 2 p.m. and he had failed to solve the problem \supset
 DIRECTLY AFTER 2 p.m. the problem wasn't solved.

In addition, verbs of success or failure, in one of their senses only, presuppose ACTIVE ATTEMPT at a time prior to the time-axis. This accounts for the infelicity of the following:¹³

- (41) *John wasn't trying to solve the problem, and then he succeeded in solving it.
 John wasn't trying to solve the problem, and he didn't succeed in solving it.
 *John wasn't trying to finish his homework, and then he managed to finish it.
 John wasn't trying to finish his homework, and he did not manage to finish it.
 *John wasn't trying to solve the problem, and then he failed to solve it.
 John wasn't trying to solve the problem, and then he didn't fail to solve it.

Further, both senses of these verbs of success/failure carry another presupposition—a negative one—with respect to the truth of the complement sentence BEFORE the time-axis of the verb. This presupposition is evident from the infelicity of

- (42) *He was here and then he failed to arrive here.
 *He was here and then he didn't fail to arrive here.
 *He solved the problem and then he failed to solve it.
 *He solved the problem and then he didn't fail to solve it.
 *He was dead and then he managed to get killed in an accident.
 *He was dead and then he didn't manage to get killed in an accident.

¹³ The sentences with asterisk following are acceptable if the mere MODALITY sense of the verb is intended; and this is to be expected, since that sense does not presuppose active attempt.

*He solved the problem and then he managed to solve it.

*He solved the problem and then he didn't manage to solve it.

Finally, while *succeed* and *manage* imply the termination of the active attempt (i.e., are neg-implicative with respect to it), *fail* implies nothing of the kind (i.e., it is non-implicative with respect to trying). These implications, as one would expect from the discussion above, pertain to the time FOLLOWING the time-axis of the verb:

(43) *He succeeded in solving the problem, then went on trying to solve it.

*He managed to solve the problem, then went on trying to solve it.

He failed to solve the problem and (then) went on trying to solve it.

He failed to solve the problem and then gave up trying.

The presuppositional and implicational structure of these verbs is summarized in Table 2 (those involving active attempt pertain only to one of the two senses).

| VERB | pertaining to accomplishment of complement-S | | pertaining to active attempt and performance of action | |
|----------------|--|-------------|--|-----------------|
| | PRESUPPOSITION | IMPLICATION | PRESUPPOSITION | IMPLICATION |
| <i>manage</i> | — | + | + | — |
| <i>succeed</i> | — | + | + | — |
| <i>fail</i> | — | — | + | (indeterminate) |

TABLE 2

2.2. THE SEMANTICS OF ACCOMPLISHMENT. In this section, I discuss a group of success verbs, including *succeed*, *manage*, *complete*, and *finish*. In 34 above, the first two were categorized as (positive) implicative, the last two as neg-implicative. This categorization requires additional scrutiny. To begin with, recall that in the preceding section (see Table 2), *succeed* and *manage* were categorized as pos-implicative with respect to ACCOMPLISHMENT of the complement-S, but neg-implicative with respect to CONTINUATION OF THE ACTION of the complement-S. Now note that the verbs *complete* and *finish* are accomplishment verbs of precisely the same type. That is, both imply accomplishment of the action described in the complement-S, but neg-imply continuation of the action after the time-axis. This is evident from the infelicity of

(44) *He completed his homework, then went on doing it.

*He finished his homework, then went on doing it.

*He completed his homework but he did not do it.

*He finished doing his homework but he did not do it.

Finish and *complete*, however, do not presuppose active attempt. They thus contrast with success/failure verbs, as is evident from the following:

(45) *Though he was not trying to solve the problem, John succeeded in solving it.

*John wasn't trying to solve the problem, and he failed to solve it.

Though he wasn't trying to solve the problem, John finished solving it.

Though he wasn't trying to solve the problem, John completed solving it.

The presuppositional and implicational properties of *finish* and *complete* are summarized in Table 3.

| VERB | pertaining to accomplishment of complement-S | | pertaining to performing the activity of complement-S | |
|-----------------|--|-------------|---|-------------|
| | PRESUPPOSITION | IMPLICATION | PRESUPPOSITION | IMPLICATION |
| <i>finish</i> | — | + | + | — |
| <i>complete</i> | — | + | + | — |

TABLE 3

Now note that the first type of implication in Tables 2-3, i.e. that pertaining to accomplishment of the goal, does not pertain to the time FOLLOWING the time-axis, but rather to the TIME-AXIS ITSELF. Verbs of accomplishment, such as *succeed*, *manage*, *finish*, and *complete*, are thus implicative verbs in a different sense than the verbs of inception, termination, and continuation given in Table 1. But with respect to the second type of implication, involving continuation of the (active attempt and) action following the time-axis, accomplishment verbs such as *manage*, *succeed*, *finish*, and *complete* are neg-implicative, and the sense of 'implicative' here does correspond to that given in Table 1. The verb *fail*, furthermore, is neg-implicative in the sense pertaining to the time-axis itself, but NON-IMPLICATIVE with respect to the time FOLLOWING the time-axis. Previous characterizations of these verbs (e.g. Karttunen 1971a) are thus seen to be incomplete.

3. PREDICATING NON-AGENTIVE SUBJECTS. The M-verbs discussed thus far, i.e. verbs of inception, termination, continuation, repetition, success, or failure, contrast with other modality verbs in several respects. For one, they may appear on the surface as predicates of non-agentive subjects. A conspicuous exception to this, quite predictably, are those senses of verbs of success/failure which presuppose ACTIVE ATTEMPT. As distinct from the other verbs/senses in this subgroup, these presuppose the volitional/intentional verb *try*, and volition/intent is one of the most universal predications restricted to human-agentive subjects. Thus, contrast 46 with 47:

- (46) The stone began to roll downhill.
 The house continued to burn.
 The rocks stopped falling on the highway.
 The clothesline snapped again.
- (47) *The stone forgot to roll downhill.
 *The house intended to burn.
 *The rocks decided to fall on the highway.
 *The clothesline tried to snap.

With respect to *succeed* or *fail*, the senses which imply trying may not predicate non-agentive subjects. Thus,

- (48) *The stone (tried hard and) succeeded in rolling downhill.
 *The house (did its best but) failed to burn down.

However, it seems that if one considers the mere negation/affirmation senses of

these verbs, they may indeed predicate non-agentive subjects:

- (49) Bruce threw the Molotov cocktail at the house, but
 { it (the cocktail) failed to explode (= It did not explode.) }
 { it (the house) failed to burn down (= It did not burn down.) }

As for the selection violations shown in 47-48, one may indeed consider them as analogous to those in 50, which involve the volitional verb *intend*:

- (50) The plague killed many people.
 *The plague killed many people intentionally.
 *The plague murdered many people.

3.1. PREDICATES OF NOMINALIZATIONS. The phenomenon discussed in this section, I would like to claim, is not unrelated to those shown above. In their normal usage, M-verbs are two-place predicates, taking a nominal subject and a sentential object. For verbs of success or failure, as shown above, another sense exists, namely a 'mere affirmative/negative' sense. What this means, more precisely, is that, in the sense which does NOT presuppose active attempt, these verbs do not predicate the surface subject of the sentence, but rather THE ENTIRE SENTENCE. If one wishes to characterize the process of SENSE-DEVELOPMENT which seems to have occurred here, one may describe it as a RAISING transformation, as in Figure 1.

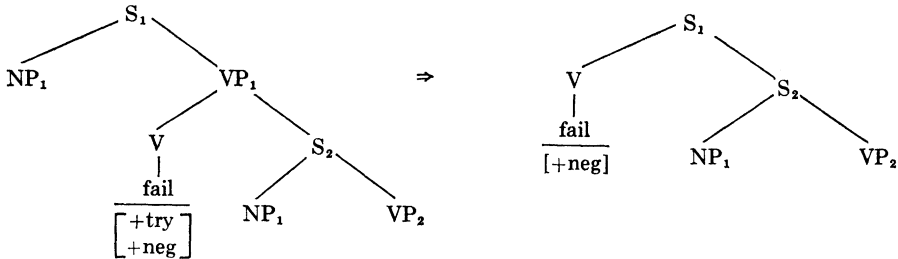


FIGURE 1

In fact, it may be unnecessary to characterize this change as 'raising', since all that happens is the LOSS OF THE PRESUPPOSITION of active attempt ([+try]), as a result of which the verb *fail* retains only its inherent implication of NEGATION ([+neg]). The structure to the left of the arrow in Fig. 1 remains the syntactic structure, but the pruned structure to the right truly represents the new semantic structure.

Now, unlike *succeed* and *fail*, the rest of the verbs so far discussed do NOT presuppose active attempt, though one might wish to argue that *start* in 51 is ambiguous, just as *succeed* or *fail* were earlier shown to be:

- (51) John started to roll down the hill =
 a. Someone pushed him (or gravity prevailed).
 b. John actively removed all obstacles and started rolling.

Given the non-active sense (a), which perhaps all these verbs share, it is not altogether an accident that one finds paraphrases of the kind

- (52) They started to celebrate ⊃ The celebration started.
 They stopped dancing ⊃ The dancing stopped.

They continued to debate \supset Their debate continued.
 They quarreled again \supset Their quarreling repeated/took place
 again.

In contrast, this is not possible with volitional/intentional (non-implicative) M-verbs:

- (53) They forgot to celebrate \supset *The celebration forgot.
 They wanted to dance \supset * The dancing wanted.
 They decided to debate \supset * Their debate decided.
 They tried to quarrel \supset * Their quarrel tried.

Perlmutter 1970 argues that the verb *begin* is really two verbs, one predicating agentive subjects, the other predicating sentential subjects or nominalization. It seems clear that many of his tests would equally well characterize other verbs in this sub-group, e.g.:

- (54) There started to be a celebration (People started to celebrate).
 There continued to be a great confusion (People continued to be
 confused).
 (55) *There wanted (to be) a celebration.
 *There forgot (to be) a debate.

I think Perlmutter is correct in pointing out the two different senses of verbs of this kind; but the label 'two verbs' seems to me ill-considered. To begin with, verbs of inception, termination, continuation, and resumption (in many and probably most languages) show this polysemy. Further, labeling the two senses as 'two verbs' may obscure what seems to be a great amount of predictability with respect to the development of the second, sentential sense of these verbs.¹⁴ Thus, if it is true that verbs of this kind have a systematic ambiguity much like *succeed* and *fail*, whereby one sense implies intent or act while the other does not (as is clearly suggested in 51 above), then one may predict that the non-active (non-intentional) sense may eventually give rise to a new SYNTACTIC situation, in which the M-verb has become, semantically as well as syntactically, predicative of its erstwhile complement SENTENCE. In other words, the same semantic process as suggested above for *succeed* and *fail* may have occurred for inceptive, terminative, and resumptive verbs—a process through which a verb predicating a nominal subject has become a SENTENTIAL MODALITY. A semantic re-analysis of this kind may be the first step, leading eventually to a syntactic re-analysis of the type observed by Perlmutter. Semantically, the development of sentential senses for *begin*, *stop*, *end*, *resume*, and *continue* may involve the 'raising' operation, as in Figure 2.

Now when the re-analysis is only semantic, one may merely get the non-active sense—with the subject still seemingly the same agentive subject, as in 51a. When the re-analysis is also syntactic, we obtain examples such as 52 or 54, where the erstwhile complement sentence does appear as the surface subject of the re-analysed verb. Further, in both Fig. 1 (*succeed*, *fail*) and Fig. 2, it seems that the re-analysis involves the LOSS OF SOME PRESUPPOSITION (attempt, intent).

¹⁴ I am assuming here that the sentential (modality) sense of these verbs has arisen, diachronically, from the non-sentential sense. This assumption must be eventually justified; see §5 below.

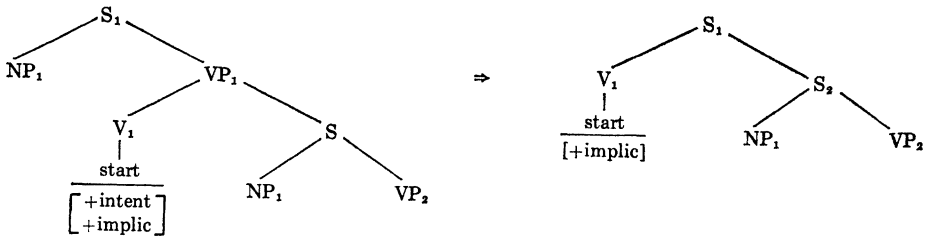


FIGURE 2

The other presuppositions, as well as the implications (negative or positive), seem to survive intact.

Given the model described above, one would like to examine the behavior of verbs of success or failure with respect to nominalized predicates. Here it seems that, although one may indeed get these verbs as predicates of nominalizations, a relatively simple implicational relation between the original sense and the nominalization sense does not obtain. Note the following:

- (56) They succeeded in celebrating * \supset The celebration succeeded.
- They failed to debate * \supset Their debate failed.

A rather complex aggregate of factors is involved here; to begin with, a sense-shift has become involved in the case of 'success'. Thus,

- (57) The celebration succeeded
- = The celebration was judged to have been successful.
- \neq Someone TRIED to celebrate and (finally) succeeded.

Further, one does obtain the following implication:

- (58) They succeeded in celebrating \supset
- Their ATTEMPT to celebrate succeeded.

This strongly suggests that the sense of *succeed* involved in the expressions on the left in 56 and 58 is not the mere-affirmative sense, but rather the ACTIVE-ATTEMPT sense. But this is precisely the sense which could not become a predicate to nominalizations, since it cannot predicate sentences, but only agentive NOMINALS. Now, note the following:

- (59) a. He succeeded in going mad
- * \supset b. His madness was successful.
- \supset c. His attempt to go crazy succeeded.
- * \supset d. His madness succeeded.

Sense 59b is clearly not the correct paraphrase of 59a. Rather, it may be appropriate to situations such as these:

- (60) a. His madness succeeded in eliciting the desired response. (ironic)
- b. The 'madness' scene in the play succeeded in delighting the audience.

Sense 59c seems to characterize 59a correctly. Sense 59d seems to be a paraphrase of (b), but not of (a) or (c).

Now, as to *fail*:

- (61) a. He failed to tame the shrew
 * \supset b. The taming of the shrew failed badly.
 \supset c. His attempt to tame the shrew failed.

It is clear that 61a may be paraphrased by 61c, but not by 61b, which is more appropriate in the context:

- (62) The taming of the shrew failed to delight Women's Liberation.¹⁵

Note further that nominalizations in English, in contexts such as those given above, often carry (factive) presuppositions. With this in mind, a natural explanation may emerge for the failure of 61b to paraphrase 61a: while the nominalization *taming of the shrew* presupposes that the act/event has taken place, the verb *fail* implies that it has not, and a contradiction results. Instead, sense-shifting takes place, and for 61b one obtains paraphrases such as 62.

Finally, note that both 60 and 62 do not involve 'active attempt' on the part of the subject of *going mad* or *taming*. Rather, in 60a the ironic sense of *succeed* is used. In 60b what is relevant is not *trying to go mad and succeeding*, but rather *trying to stage an effective production of the madness scene and succeeding*; while 62 has the mere-negative sense in the reading intended here. This is precisely what one would expect: if predicates of nominalizations are in some sense predicates of sentences, then the presupposition of *trying to accomplish* is inappropriate, and can be obtained only when sense-shifting recreates an appropriate context for it, in which *try*, *succeed*, or *fail* predicate human-agentive nominals.

4. THE TIME-AXIS PHENOMENON IN OTHER VERB TYPES. The discussion thus far has been limited to implicative and neg-implicative M-verbs. For these, the time-axis distribution of some presuppositions (prior) and most implications (following) has been demonstrated. In this section it will be shown that the time-axis phenomenon pertains to other verb-types as well.

4.1. TIME-AXIS AND INTENSIONAL (NON-IMPLICATIVE) M-VERBS. In Givón 1972c, I argue that intensional verbs, i.e. those labeled in 34 above as non-implicative M-verbs, involve the Future or Uncertainty modality in their complement sentences. This may be shown in two ways. First, nominals in the complement sentence exhibit REFERENTIAL OPACITY, so that 63 below has two distinct readings, with (a) pertaining to a specific girl and (b) to *such a girl*:

- (63) John wants to marry a girl with blue eyes.
 a. There's a girl with blue eyes such that John wants to marry her.
 b. John wants to marry a girl, and all he has in mind is that she must have blue eyes.

Here the Future or Uncertainty modality of the complement sentence is responsible for opaque nominals under its scope. Now note that, for implicative and neg-implicative verbs, one may not open a future-time gap between the main

¹⁵ For the purpose of this discussion, one should disregard the sense in which 'The taming of the shrew' is taken to be the name of a play, though 62 would make equally good sense under that reading.

and complement verb:

- (64) *Yesterday Marvin failed to solve this problem tomorrow.
 *Yesterday Marvin succeeded in solving this problem tomorrow.

In contrast, a future-time gap may be opened if the M-verb is non-implicative:

- (65) Yesterday Marvin decided to solve this problem tomorrow.
 Yesterday Marvin wanted to solve this problem tomorrow.
 Yesterday Marvin planned to solve this problem tomorrow.

This suggests, not that non-implicative verbs 'have no implications', as is customarily asserted, but rather that their implications pertain to a sentential complement that is not in a Factive or Certainty modality. That is, the sentential complement is in the Future or Uncertainty modality. In fact, it would be rather disastrous to maintain that these verbs 'have no implications', since that would amount to their having NO MEANING. One may thus suggest the following meaning postulate for non-implicative verbs:

- (66) $v(S) \supset \text{Uncertain-S}$ (or: $v(S) \supset \text{Intent-S}$)

The negation of an intensional verb will not imply the negation of Uncertain, but it does imply the negation of Intent. Thus 67 is not a correct meaning postulate for intensional verbs, but 68 is:

- (67) $\sim v(S) \supset \sim \text{Uncertain-S}$
 (68) $\sim v(S) \supset \sim \text{Intent-S}$

This is evident from

- (69) *Marvin doesn't want to work, and therefore he'll work.
 *Marvin doesn't want to work, and therefore he intends to work.
 (70) Marvin doesn't want to work, and he may or may not work.
 Marvin doesn't want to work, he doesn't intend to.

Finally, note that modus tollens seems to apply to intensional verbs, so that

- (71) $\sim \text{Uncertain-S} \supset \sim v(S)$

In other words, if the complement-S is taken to be certain, the use of an intensional verb is ruled out, as is evident from

- (72) *Marvin wants to deflower his cousin though he has already done it.
 *Marvin has deflowered his cousin and he wants to do it very badly.

As will be shown below, the infelicity of 72 is strongly linked to the presuppositions of intensional verbs.

The discussion above establishes, albeit informally, that the implications of intensional verbs pertain to a time following the time-axis. Let us now turn to their presuppositions. Intensional verbs turn out to have negative presuppositions with respect to the truth of their complement at a time PRIOR TO the time-axis. This explains the infelicity of

- (73) *Marvin wants to deflower his cousin, though he has already done it.
 *Marvin has deflowered his cousin and he wants to do it very badly.
 *Marvin doesn't want to deflower his cousin since he's already done it.¹⁶
 *Marvin has deflowered his cousin and he doesn't want to do it.

¹⁶ This concatenation may be acceptable if the negation is interpreted as EXTERNAL.

The same presuppositions are shared by neg-volitional intensional verbs such as *fear* or *hate*:

- (74) *Marvin has lost his hair and he's afraid to lose it.
 *Marvin has lost his hair and he's not afraid to lose it.

Implicative verbs such as *remember* (positive) or *forget* (neg-implicative), when used as M-verbs, have developed a presupposition of OBLIGATION (probably 'obligation known to subject'). This presupposition pertains to the time prior to the time-axis, unlike the normal 'timeless' presupposition of these factive verbs when used as C-verbs. This explains the infelicity of

- (75) *Tom wasn't supposed to do his homework and he forgot to do it.
 *Tom wasn't supposed to do his homework and he didn't forget to do it.
 *Tom wasn't supposed to do his homework and he remembered to do it.
 *Tom wasn't supposed to do his homework and he didn't remember to do it.

Finally, neg-implicative verbs such as *avoid*, *neglect*, and *escape* (also *decline* and *refuse*) also presuppose 'known obligation', and this presupposition again pertains to the time prior to the time-axis. This explains the infelicity of

- (76) *Marvin wasn't supposed to come home and he avoided doing it.
 *Marvin wasn't supposed to come home and he didn't avoid doing it.

Much like *fail*, these neg-implicative verbs are prone to develop another, mere-negation sense, and that sense does NOT presuppose known obligation. Thus,

- (77) We waited and waited, though he wasn't supposed to show up, and indeed he didn't show up.¹⁷

4.2. TIME-AXIS AND COGNITION VERBS. In previous discussion in the literature (e.g. Kiparsky & Kiparsky 1968, Morgan 1969, Karttunen 1971a), only one type of presupposition associated with factive cognition verbs has been discussed, and that type does not involve the time-axis. In addition, however, many verbs in this group exhibit another type of presupposition, one for which the time-axis is relevant. Take, for example, *realize*, a representative of 'come-to-know' verbs (*learn*, *find out*, *discover*). The 'timeless' presuppositions associated with it are evident from the infelicity of

- (78) *Wyatt realized that Doc had left town, though Doc had not left town.
 *Wyatt didn't realize that Doc had left town, and indeed Doc had not left town.

In addition, *realize* involves the presupposition that, at the time BEFORE the time-axis, the subject of *realize* was not aware of the truth/falsity of the complement sentence. This is evident from the infelicity of

- (79) *Yesterday Wyatt realized that Doc had tuberculosis, though he had known about it for a month now.

¹⁷ It may well be that while 'obligation' is not presupposed, 'expectation' is; if this is still the case with 'neglect' in 77, then the sentence is probably ungrammatical.

*Yesterday Wyatt didn't realize that Doc had tuberculosis, though he had known about it for a long time now.

In addition, *realize* has the implications of 'gaining knowledge', and those pertain to the time FOLLOWING the time-axis. This explains the oddity of

(80) *Yesterday Wyatt realized that Doc was a coward, though right after he realized it he believed that it was NOT the case.

*Yesterday Wyatt didn't realize that Doc was a coward, though right afterward he believed that it was the case.

Let us now turn to *remember* and *forget* as C-verbs. Both share the 'timeless' presupposition discussed above, as factive verbs. Further, both share the presupposition of knowledge of the complement-S at some time PRIOR to the time-axis. This explains the oddity in

(81) Until yesterday at 2 p.m. he hadn't known that his wife was a virgin,

*and at 2 p.m. he didn't remember that she was.

*and at 2 p.m. he remembered that she was.

*and at 2 p.m. he didn't forget that she was.

*and at 2 p.m. he forgot that she was.

With respect to this presupposition, *remember* and *forget* do not differ. However, *remember* has an added presupposition, that of 'loss of awareness', pertaining again to a time prior to the time-axis (though subsequent to the presupposed knowledge discussed above). This is evident from the oddity in

(82) John has always known that his wife was a virgin,

*and then he remembered that she was.

*and then he didn't remember that she was.

With respect to their implications, pertaining to the time FOLLOWING the time-axis, *remember* and *forget* pair as antonyms, with *remember* implying gain of knowledge, and *forget* implying no gain of knowledge.

The verb *pretend*, in addition to its 'timeless' presupposition as a neg-factive verb (see discussion above), also presupposes that the subject had knowledge of that falsity of the complement-S, and this presupposition does pertain to the time PRIOR to the time-axis, which explains the oddity in

(83) Ophelia didn't know that Hamlet didn't love her,

*and she pretended that he did.

*and she didn't pretend that he did.¹⁸

Pretend also has implications, pertaining to the time AFTER the time-axis: it implies 'attempt to create in someone else a false impression with respect to the subject's knowledge of the truth'. This explains the oddity of 84a:

(84) Ophelia wanted everybody to know that she knew that Hamlet didn't love her,

a. *so she pretended that he loved her.

b. so she didn't pretend that he loved her.

Sentence 84b above is of course acceptable, since the 'attempt to create false impression' is not a presupposition, but rather part of the assertive meaning of *pretend*.

¹⁸ See fn.16.

Finally, non-factive verbs such as *believe*, *think*, or *hope* do not have the 'timeless' presupposition with respect to the truth of their complement-S. As to the presupposition pertaining to the time PRIOR to the time-axis, since they are verbs of STATE, their use need imply no specific time at which belief or hope begin. In this sense they are like *know* and unlike *realize*. Thus if no time-adverb is used, i.e. if the statement is HABITUAL, no previous state of non-belief or non-hope (or non-knowledge, for *know*) is presupposed. However, when time-adverbials are used, a previous state of non-belief, non-hope, or non-knowledge does seem to be presupposed, which explains the oddities in the following:¹⁹

- (85) John had known about it all along,
 *and yesterday he knew that his wife was a virgin.
 John had thought it all along,
 *and yesterday he thought that God was dead.
 John had hoped it all along,
 *and yesterday he hoped that his wife was not a virgin.

4.3. TIME-AXIS AND VERBS WITH LOCATIVE COMPLEMENTS. Up to this point, our discussion has evolved around verbs with overt sentential complements. It may be shown, however, that the time-axis phenomenon applies equally well to verbs whose complements do not appear to be sentential at the syntactic surface. As for verbs of motion or location, their presuppositions and implications pertain to the LOCATION OF THE SUBJECT before and after the time-axis. In addition, some verbs, such as *come* and *go*, also have DEICTIC presuppositions, pertaining to the location of the SPEAKER. Note the contrast between the pairs in Table 4.²⁰

| | PRESUPPOSITION (prior) | IMPLICATION (after) |
|--------------|--------------------------|-----------------------------|
| <i>enter</i> | [-inside place] | [+inside place] |
| <i>exit</i> | [+inside place] | [-inside place] |
| <i>to</i> | [-at place] | [motion toward [+at place]] |
| <i>from</i> | [+at place] | [motion toward [-at place]] |
| <i>go</i> | [-motion toward speaker] | [motion] |
| <i>come</i> | [+motion toward speaker] | [motion] |

TABLE 4

When *go* or *come* are combined with either *to* or *from*, one obtains situations such as these:

- (86) a. John came to San Francisco yesterday.
 - ▷ Directly after (coming) John was in San Francisco. (implication of *to*)
 - > Directly before John wasn't in San Francisco. (presupposition of *to*)
 - > At time-axis the speaker was in San Francisco. (presupposition of *come*)

¹⁹ The negatives corresponding to the asterisked portions may not be cited as evidence here, since they would result in mere contradiction.

²⁰ In *come* and *go*, the exact time at which the position of the speaker is relevant is not clear to me. With respect to both, it seems, the position of the speaker AT the time-axis is the crucial issue. However, what happens when they are coupled with either *to* or *from*, which have their own presuppositions (in English), may influence this; see below.

- b. John went from San Francisco yesterday.
- ▷ Directly after (going) John was not in San Francisco. (implication of *from*)
 - > Directly before John was in San Francisco. (presupposition of *from*)
 - > At time-axis the speaker was not in San Francisco. (presupposition of *go*)

One should also note that, in some languages, *come* and *go* do not appear as lexical items without incorporating the presuppositions and implications of either *to* or *from*. E.g., in Bemba (see Givón 1972b), one finds the following four motion verbs:

- (87) *-isa* 'come to'
-fuma 'come from'
-ya 'go to'
-shya 'go from'

Note that Eng. *enter* and *exit* have incorporated the Latin prepositions 'in' and 'out' in very much the same way, except that no deictic presupposition holds.

It is also possible to show that verbs of 'causing-motion', such as *send*, *bring*, and *give*, involve the time-axis in very much the same way, except that here it pertains to the position of the DIRECT OBJECT vis-à-vis the locative-goal. First, note that some of these verbs are IMPLICATIVE in the sense defined by Karttunen 1971a. Thus *bring* and *give* both imply that the object has moved to the locative-goal (i.e., they abide by the meaning postulate $v(S) \supset S$, where S is taken to be 'direct object is at LOC_{NP} '). Thus,

(88) Marvin brought the book to the house \supset The book is in the house.
 They also abide by the second meaning postulate ($\sim v(S) \supset \sim S$); hence,

- (89) Marvin didn't bring the book to the house \supset
 The book isn't at the house.

Finally, they seem to abide by modus tollens, so that

- (90) \sim (The book is at the house) \supset
 \sim (Marvin brought the book to the house).²¹

In addition, verbs of this kind have presuppositions pertaining to the location of the direct object BEFORE the time-axis. This explains the infelicities in

- (91) Melva had her Bible with her,
 *and John brought it to her.
 *and John didn't bring it to her.

Finally, *send* and *bring* seem to differ with respect to the location of the subject-causer at the time-axis. *Send* presupposes that the subject is away from the

²¹ Here one must remember that the implication holds true only for the particular time involved in this situation. Thus, 90 should be interpreted with this in mind, e.g.: \sim (DIRECTLY AFTER 2 p.m. the book was at the house) \supset \sim (At 2 p.m. Marvin brought the book to the house).

goal. This explains the oddities in

- (92) Until 2 p.m. John was with Melva,
 *and at 2 p.m. he sent her a letter.
 *and at 2 p.m. he didn't send her a letter.

Bring does not share this presupposition. However, it implies that at the time-axis (and thus for some time directly after it) the subject-causer was at the goal (together with the direct object). This explains the oddity of

- (93) *John brought a present to Melva, though he was not there personally to deliver it.

4.4. TIME-AXIS AND COERCIVE-MANIPULATIVE VERBS. As Karttunen 1971a notes, verbs of CAUSATION belonging to this group do not share all the meaning postulates of implicative verbs. They do abide by the first postulate ($v(S) \supset (S)$); hence,

- (94) John made Melva shave her legs \supset Melva shaved her legs.

They do not, however, abide by the second meaning postulate ($\sim v(S) \supset \sim(S)$); hence,

- (95) John didn't make Melva shave her legs * \supset
 Melva didn't shave her legs.

Karttunen 1971a labels verbs in this group IF-VERBS. It may well be that this property of if-verbs is traceable to their CAUSATIVE internal structure, as summed up in Figure 3.

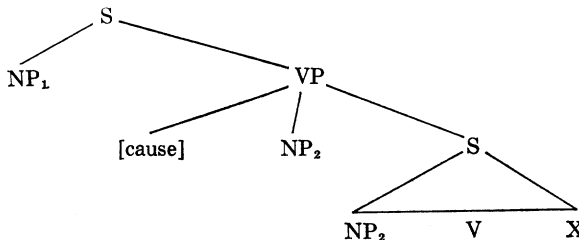


FIGURE 3

The negation of an if-verb is thus a negation of Cause, with no further implication as to the truth/falsity of the embedded sentence. Some if-verbs are NEG-IMPLICATIVE, and in those the negation is not embedded above Cause, but rather over the embedded sentence itself. Thus, for a verb such as *prevent*,

- (96) John prevented Melva from shaving her legs \supset
 Melva didn't shave her legs.

These verbs thus obey the first meaning postulate characteristic of neg-implicative verbs (= 19):

- (97) $v(S) \supset \sim(S)$

Karttunen 1971a claims that they do not obey the second one, however, viz. $\sim v(S) \supset (S)$ Thus, according to him,

- (98) John didn't prevent Melva from shaving her legs * \supset
 Melva shaved her legs.

It seems to me, however, that this is true only if EXTERNAL negation is involved, i.e. if 98 is paraphrased by

- (99) It is not true that John prevented Melva from shaving her legs.

Otherwise, when INTERNAL negation is meant (i.e. when none of the presuppositions are denied), it seems that an implicative relation does hold:

- (100) John didn't prevent Melva from shaving her legs \supset
 Melva shaved her legs.

Finally, if-verbs, both negative and positive, abide by modus tollens (postulate: $\sim(S) \supset \sim v(S)$); hence,

- (101) $\sim(\text{Melva shaved her legs}) \supset \sim(\text{John made Melva shave her legs}).$
 $\sim(\text{Melva didn't shave her legs}) \supset \sim(\text{John prevented her from doing it}).$

With respect to their implications, verbs in this group may be divided three ways, just like implicative verbs:

- (102) IMPLICATIVE: *force, make, cause.*
 NEG-IMPLICATIVE: *prevent.*
 NON-IMPLICATIVE: *permit, forbid, order, tell, persuade, dissuade, request, warn.*

The implications discussed above pertain to the time FOLLOWING (or directly at) the time-axis of the verb. Thus,

- (103) At 2 p.m. John made Melva go inside \supset
 DIRECTLY AFTER 2 p.m. Melva was inside.

The non-implicative verbs in 102 all involve the Future or Uncertainty modality with respect to their complement sentences, and may thus allow the opening of a future-time gap. Thus contrast the following:

- (104) Yesterday John told Melva to shave her legs today.
 *Yesterday John made Melva shave her legs today.
 *Yesterday John prevented Melva from shaving her legs today.

For further discussion of this see Givón 1972c.

Two of the non-implicative verbs in 102, *forbid* and *dissuade*, are inherently negative; i.e., the intent of the manipulator is a state of affairs whereby a NEGATION of the complement-S is true. One may sum up their structure as in Figure 4.

In addition to their implications, all coercive-manipulative verbs also exhibit negative presuppositions with respect to the truth of the complement-S BEFORE the time-axis. This explains the oddity of the following:²²

- (105) Melva has lost her virginity,
 *and then John told her to do it.
 and then John didn't tell her to do it.
 *and then John forced her to do it.

²² The cases followed by an asterisk may be acceptable if the negation is interpreted as external.

- *and then John didn't force her to do it.*
- *and then John prevented her from doing it.
- *and then John didn't prevent her from doing it.*
- *and then John forbade her to do it.
- *and then John didn't forbid her to do it.*

4.5. TIME-AXIS AND VERBS REQUIRING A DIRECT OBJECT. One may show that the time-axis phenomenon applies also to verbs which require nominal direct objects. First, note that they may have an implication which pertains to the time AFTER the time-axis (i.e., they abide by the first meaning postulate: $v(S) \supset (S)$). This explains the oddity of

- (106) *Directly after 2 p.m. my pen was not broken though at 2 p.m. I broke it.
- *Directly after 2 p.m. the apple wasn't in my stomach, though at 2 p.m. I ate it.
- *Directly after 2 p.m. Tom wasn't dead, though at 2 p.m. I killed him.

These verbs, it seems, behave semantically as if they have SENTENTIAL complements to which their implications pertain (and presuppositions; see below), even though on the syntactic surface their complements are nominal. Karttunen 1971a claims that they are not 'implicative' but rather 'if-verbs', i.e. that the second meaning postulate ($\sim v(S) \supset \sim(S)$) does not hold for them. That is,

- (107) John did not kill Marvin \supset Marvin is not dead.

As with coercive-manipulative 'if-verbs', note that Cause is involved in the underlying structure of the implicative verbs of this group, and that the negation of any of these verbs is a negation of Cause alone rather than of the complement-S; see Figure 5.

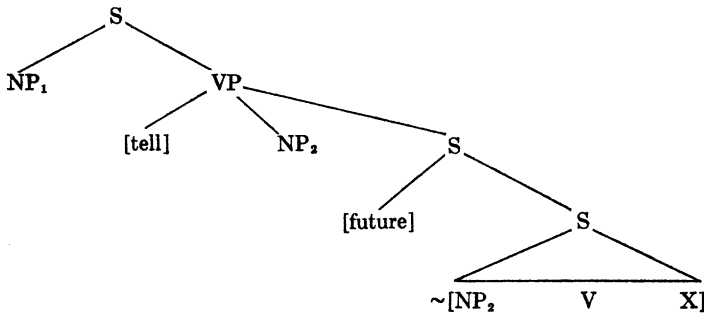


FIGURE 4

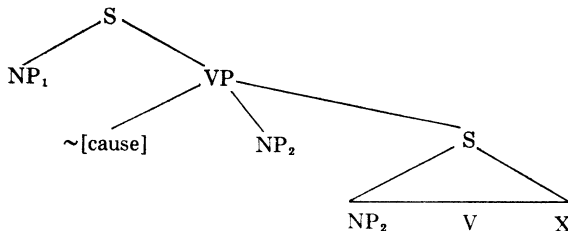


FIGURE 5

These verbs do abide by the third meaning postulate (*modus tollens*); thus,

(108) $\sim(\text{Marvin died}) \supset \sim(\text{John killed Marvin})$.

In addition to their implications, these verbs also have negative presuppositions with respect to the same sentence involved in their implications, and these presuppositions pertain to the time PRIOR to the time-axis. This explains the oddities in

(109) *Marvin was dead, and then John killed him.

*Marvin was dead, and then John didn't kill him.

*The pen was broken, and then John broke it.

*The pen was broken, and then John didn't break it.

*The apple was in his belly, and then John ate it.

*The apple was in his belly, and then John didn't eat it.

A small number of verbs in this syntactic category are 'intensional', and do not imply the truth/falsity of the (semantic) complement-S. Verbs such as *look for* and *want* are examples; thus,

(110) John has the apple \supset The apple is with John.

John wants the apple $*\supset$ The apple is with John.

This parallelism with other groupings extends to the question of referential opacity, for which see Givón 1972c. The parallelism also extends to the presence of neg-implicative verbs in this group; thus,

(111) John freed the slaves \supset The slaves are NOT in captivity.

John imprisoned the slaves \supset The slaves are in captivity.

5. A DIACHRONIC LOOK AT A SYNCHRONIC MODEL. In the discussion thus far, I have confined myself mostly to a synchronic description; but the present section will be given primarily to diachronic considerations. To phonologists, the extreme usefulness of diachronic studies for the validation of universal claims about the phonology of human language has long been taken for granted. The study of diachronic semantics, on the other hand, is usually looked upon with considerable disdain. Here I hope to demonstrate the potential usefulness of studying diachronic processes in syntax/semantics. Only two, highly widespread processes will be discussed, one involving the diachronic rise of sentential modalities from M-verbs, the other involving the polysemy of C-verbs. Needless to add, the preliminary sketches presented below barely scratch the tip of what is likely to be a mammoth iceberg.

5.1. M-VERBS AND THE RISE OF SENTENCE MODALITIES. Linguists have noted for a long time that, at the surface-syntactic level, tense-aspect-mode-negation morphemes most often appear as adjuncts of the VERBAL phrase. This is despite the fact that semantically these morphemes are modalities which pertain to ('predicate') the entire sentence. I have shown above that verbs of inception, termination, continuation, and resumption quite regularly develop senses which semantically—and often also syntactically—are predicates of the complement sentence (or of its nominalized form). I have characterized this process as 'raising'—in which the presuppositions of Intent or Active-attempt have also been removed, though other presuppositional and implicational contents of the verb have remained intact. These 'raised' senses of these verbs have, semantically,

become SENTENTIAL MODALITIES. Syntactically, however, they remain as verbs or verb-phrase adjuncts.

We have seen a similar situation with verbs such as *fail* and *manage*. By losing the presupposition of Active-attempt, they have developed, in English, sentence modality senses of negation and affirmation, respectively. Syntactically, they also remain verbs or VP adjuncts. In fact, modality verbs have universally contributed to the rise of tense-aspect-mode morphemes in language. Some of the parameters constraining such developments will be discussed below.

There are two pre-conditions which facilitate the rise of modality morphemes from M-verbs. One of them is syntactic/morphemic, and involves the equi-subject condition characteristic of these verbs, which most normally results in equi-NP-deletion. Thus, the 'raising' operation described in Fig. 2 may be facilitated by the syntactic operation of equi-NP-deletion, as shown in Figure 6.

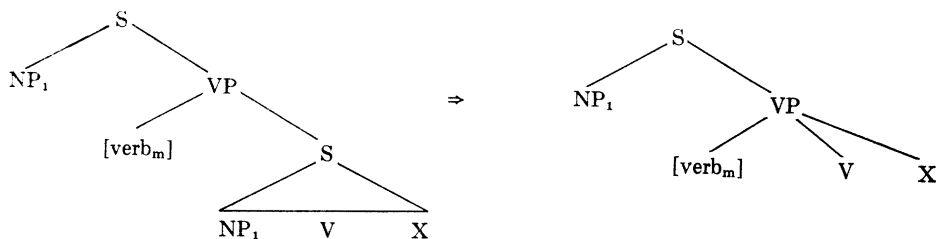


FIGURE 6

Semantically, the erstwhile verb is then 'raised' to become a sentence modality, as in Figure 7.

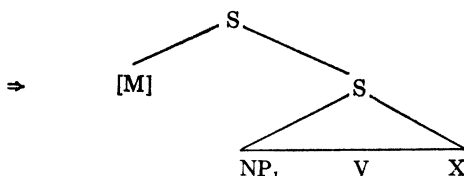


FIGURE 7

The other major factor which constrains and facilitates the development of sentential modalities from M-verbs involves their semantics, i.e. the specific presuppositions and implications of these verbs, all arrayed with respect to the time-axis of the verb. This subject will be discussed below under several headings.

5.11. INTENSIONAL VERBS AND FUTURE MODALITIES. I have suggested above that non-implicative M-verbs all involve the modality Future with respect to their complement sentence. Further, I have also shown that all of them have NEGATIVE presuppositions with respect to the truth of their complement sentence prior to the time-axis. Now this is precisely the same presupposition associated with the modality Future, as can be shown from the infelicities in

(112) *Marvin has deflowered his cousin, and he'll do it tomorrow.

*Marvin has deflowered his cousin, and he won't do it tomorrow.

Thus, when a non-implicative M-verb becomes a future-tense marker, it pre-

serves both the implication Future (vis-à-vis the complement-S) and the negative presupposition with respect to the past. It loses, however, the implication of INTENT; thus,

- (113) Marvin will deflower his cousin \neq
Marvin wants to deflower his cousin.

The verb *will* 'want' of Germanic has given rise to the future marker in English. The verb *-taka* 'want' in Swahili has given rise to the future modality *-ta-*, as in

- (114) *n-a-taka ku-la* 'I want to eat.'
ni-ta-kula 'I will eat.'

A similar development is found in Palestinian Arabic, where the verb 'want' is used ambiguously:

- (115) *biddi ašrīb* (a) 'I want to drink'; (b) 'I will drink.'

Given the implication of Future and the neg-presupposition vis-à-vis the past which normally characterizes intensional verbs, the development of future modalities from them is virtually predictable.

5.12. Finish, begin, continue, AND TENSE MARKERS. As shown above, the verb *finish* has positive presuppositions with respect to the past (i.e., the truth of the complement prior to the time-axis), but negative implications with respect to the future (i.e., the truth of the complement after the time-axis). This marks it as a prime potential source for PAST-TENSE markers. Now note the following development in Bantu (for further detail, see Givón 1972b, part 3), where three verbs 'finish' have contributed in some cases to the successive rise of three PAST tense-aspects. The oldest case involves the 'perfective'/'terminative' suffix *-ile* which is reconstructible already in Proto-Bantu as a tense-aspect. The second involves the verb **-mala* 'finish' in Swahili, which (inflected by the *-ile* suffix), has given rise to the *-me-* perfective tense in Swahili; thus,

- (116) *ni-me-lala* 'I have gone to sleep.'

Third and quite recently, the verb *-isha* 'finish' in Swahili has become the recent-past marker *-sha-*, often in conjunction with the perfective tense, as in

- (117) *ni-me-sha-pika* 'I have just finished cooking.'

A similar change has occurred in Kishamba, a Swahili-based creole language, where the verb *-isha* 'finish' has become the normal past-tense marker:²³

- (118) *yeye kwisha piga mimi* 'He hit me.'

The change from verb to modality marker in Bantu usually involves the 'binding' of the erstwhile verb into a prefixed position, making it an adjunct of the verbal word (for details, see Givón 1971b). English tends, on the other hand, to suffix the reduced modal to the preceding word, e.g. *I'll, we've, he's, don't, she'd* etc.

A similar development has occurred in Spanish, where the verb *acabar* 'finish' has become a recent-past terminative marker;

- (119) *Juan acaba de llegar* 'Juan has just arrived.'

²³ I am indebted to Martin Mould for this data.

On the other hand, in another Bantu language, SiLuyana, the verb *-tamba* 'begin', which has the opposite presuppositions and implications of 'finish', has become a future-tense marker, as in

(120) *ni-mba-kela* 'I will work.'

Having negative presuppositions with respect to the time PRIOR to the time-axis and positive implications with respect to the truth of the complement AFTER the time-axis, this development of 'begin' is of course not surprising.

Finally, note the development in Bemba, another Bantu language (for details, see Givón 1972b), where the verb *-lála* 'sleep, continue on doing', has given rise to the CONTINUOUS aspect marker;

(121) *n-à-bomba* 'I worked.'

n-à-léé-bomba 'I was working.'

n-kà-bomba 'I will work.'

n-kà-láá-bomba 'I will be working.'

5.13. NEG-IMPLICATIVE VERBS AND NEGATION MARKERS. Negation markers are semantically sentence modalities. Nevertheless, they appear in most languages as verb-phrase adjuncts, much like other verb-derived modals. Thus, the VERB-FINAL position of 'not' in Germanic (*have not, do not, was not*) is compatible with the earlier SOV syntax of Indo-European, a syntax in which M-verbs will give rise to verb-suffixed modality markers (for further discussion of this, see Givón 1971a). The development discussed earlier, in which the neg-implicative verb *fail* developed a mere-negation sense, is rather typical of this process. This type of a development is extremely common in Bantu languages: thus in Kihung'an,²⁴ the neg-implicative verb *-khona* 'refuse' has become the negation marker in relative clauses, focus and cleft constructions, and WH-questions. In Bemba the neg-implicative verb *-bula* 'lack, miss' has become the negation marker in counterfactual conditionals:

(122) *à-ba-bulaa-bomba* 'Had they not worked ...'

The verb *-kaana* 'refuse, fail, decline' has become the infinitival negative marker, as in

(123) *uku-bomba* 'to work'

uku-kaanaa-bomba 'to not work'

These diachronic developments should be predictable, given the neg-implicative nature of these verbs and the 'raising' operation discussed earlier.

5.14. Come AND go. In many languages the verbs 'come' and 'go' have given rise to tense-aspect markers. Syntactically, it is quite common to find them first developing an M-verb sense of 'intending to', 'in order to'; thus,

(124) I have come (here) to talk business.

I went (there) to obtain the permit.

It may well be that this development, whereby these motion verbs develop an equi-subject (and equi-NP-deletion) condition, serves as a necessary prelude to their developing into sentential modalities. What is more interesting, of course, is the fact that the verb 'go' seems to give rise chiefly to FUTURE modalities. This

²⁴ For details, see Takizala 1972.

has occurred in English, French, Spanish, Hebrew, and some Arabic dialects, as well as Kishamba (for the data, I am indebted to Martin Mould), and the English-based Krio (for the data, I am indebted to Tom Peterson):

- (125) ENGLISH: I'm going to see him tomorrow.
- FRENCH: *Il va partir demain* 'He'll leave tomorrow.'
- SPANISH: *Yo voy a visitarla mañana* 'I'm going to visit her tomorrow.'
- PALESTINIAN ARABIC: *ana ha jib-lik babur* 'I'll give you a train.'
- HEBREW: *ani holex laasot et ze maxar* 'I'll do it tomorrow.'
- KISHAMBA: *sisi na-ku-enda ku-ona yeye* 'We will see him.'
- KRIO: *wi go tray for puš di trak* 'We will try to push the truck.'

The plausibility of viewing the sense of 'go' in 124 as intermediate in this development is enhanced by the semantic presence of 'intend'. As noted above, intensional (non-implicative) M-verbs are a major diachronic source of future modalities in language.

The verb 'come', on the other hand, seems more often to give rise to PAST tense-aspects, as in French

- (126) *Il vient de partir* 'He has just left'

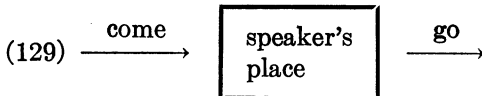
or the negative-past of Swahili:

- (127) *ha-wa-ja-enda* 'They did not go.'

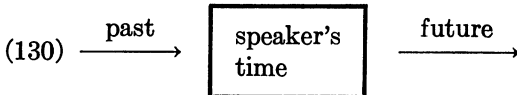
However, there are languages where 'come' gives rise to a future modality. This has occurred in Finnish (for the data, I am indebted to Raimo Anttila);

- (128) *Minä tulen tekemään sen* 'I will do it.'

If in fact it turns out that 'go' gives rise mostly to 'future', and 'come' mostly to 'past', a systematic explanation must be sought. A possible one is the following: We noted above that 'come' presupposes motion toward speaker, while 'go' presupposes motion away from speaker. In a spatial diagram, this may be represented as follows:



The diagram above pertains to these verbs as connoting motion-in-space. As tense-aspect markers, however, they will connote progress-in-TIME. Suppose that 129 is abstracted to a TEMPORAL diagram, as follows:



If time is viewed as a LINEAR progression, which is a reasonable assumption so far as human language is concerned, then past time is moving toward the speaker's time, while future time is moving away from the speaker's time. This preserves the presuppositional scheme of 'come' and 'go', but transfers its medium from space to time.²⁵

²⁵ This is obviously not the last word on the subject. Baron 1972 notes that both the diachronic and ontogenetic rise of modalities from erstwhile verbs may often occur in the

Alternative explanations should also be considered. E.g., note that the use of 'come' as a recent-past modality in French involves the preposition *de* 'from', while the use of 'go' as a future modality in Spanish involves the preposition *a* 'to' (the same is true for Hebrew, and may earlier have been true for French). As was noted above, 'from' has positive presuppositions pertaining to the time before the time-axis (past), and negative implications with respect to the time after the time-axis (future). 'To' has just the opposite characteristics. In specific cases, one may have to consider the particular prepositional complementation which participated in the process of change from verb to sentential modality.

Finally, in Bemba (for details, see Givón 1972b), the verb *-isa* 'come to' has recently given rise to the aspectual marker *-ísádá-* 'later on', while the verb *-yá* 'go to' has given rise to the aspectual marker *-yádá-* 'elsewhere'. The schematic frame 'at a different ___' is shared by both, but the parameter involved in 'come' has become temporal, while that involved in 'go' remains spatial. At the moment I have no natural explanation for this difference.

5.15. ABILITY, PERMISSION, and PROBABILITY. The verb 'can' or 'be able to' shows a systematic three-way ambiguity in many languages. First, it has the M-verb (intensional) sense which predicates a human-agentive subject, that of 'know how to, have the innate ability to perform'. In addition, 'can' quite often develops two other senses which may be characterized by the 'raising' operation discussed earlier. One of them is the EPISTEMIC sense, which quantifies the DEGREE OF CERTAINTY the speaker has with respect to the embedded sentence, i.e. the PROBABILITY assigned to the proposition. In this sense, 'can' is a SENTENTIAL modality, and may be characterized as in Figure 8.

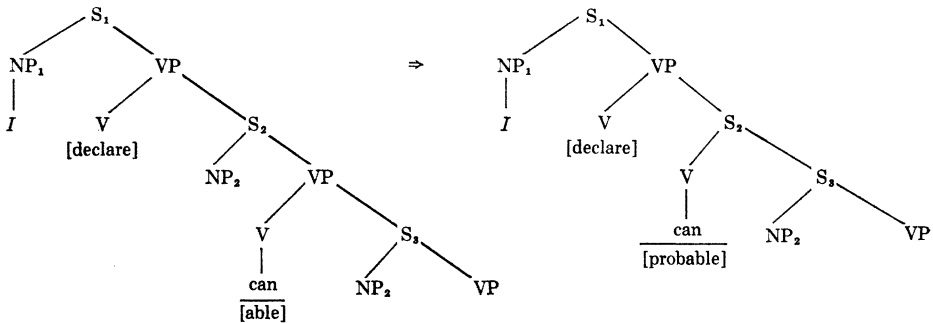


FIGURE 8

context of specific tenses. A case with strong bearing on this issue involves the development of 'have' in Romance as both a past tense-aspect and a future tense-aspect. Benveniste 1968 points out that the FUTURE modality arising from *habere*, as in the French *viendr-ais* 'you'll come', arose from the auxiliary use of *habere* as an imperative 'must' modal, as in *venire habes* 'you have to come'. As I have argued elsewhere (Givón 1972c), the verb 'order, command' is a non-implicative verb carrying the Future or Uncertain modality with respect to its complement-S. The development of *habere* into a future marker thus may be traced to the construction in which it was used as an imperative modality.

In addition, 'can' often develops another 'raised' sense, that of PERMISSION. This sense involves the change of the performative 'declare' to 'permit', and may be characterized as in Figure 9.

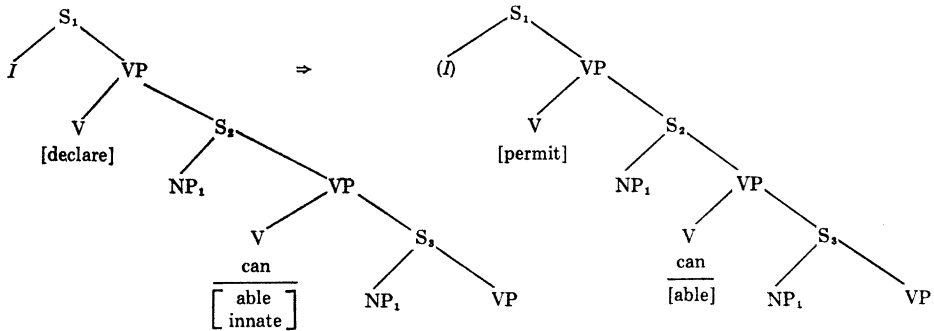


FIGURE 9

Now the 'ability' sense of 'can' is itself an INTENSIONAL (non-implicative) M-verb. In Givón 1972c I argue that these verbs involve the modality of Uncertainty in their complement-S, while implicative M-verbs involve the modality of Certainty. These two modalities probably correspond to what the logicians call 'possible' and 'necessary', respectively. The original (M-verb) sense of 'can' thus already involves the implied modality Possible. In the development of the EPISTEMIC sense, this modality is preserved (while other portions of the semantics of 'be able', such as those pertaining to innate abilities of the subject, are dropped). The same is true of the PERMISSION ('root') sense. As I have shown above, 'permit' is a non-implicative (thus 'intensional') verb. In Givón 1972c I argue that the modality of Uncertainty (hence Possible) is characteristic of verbs of this type. Thus the development of the 'permission' sense of 'can' may involve a change from 'declare' to 'permit', but the Possible modality with respect to the truth of the complement-S remains intact. This modality thus seems to be the underlying leitmotif of the three senses of 'can'.

5.16. In summary: it has been shown that a number of predictions may be made as to what type of sentential modality will arise from an M-verb. I suggest that non-implicative M-verbs are likely to give rise to future modalities, that terminative verbs are likely to give rise to past-time modalities, that neg-implicative verbs are likely to give rise to Negative modalities, and that 'ability' verbs are likely to give rise to Possible modalities. While the findings discussed above are at best preliminary, I think they give considerable support to the time-axis analysis presented above. In particular, three properties of verbs make them natural candidates for the development of sentential modalities:

(a) The dichotomy between presuppositions and implications of the same verb: this is particularly important because it may closely coincide with the dichotomy between the Certain/Necessary and Uncertain/Possible modalities. These two modal operators, together with Negative, turn out to be essential for characterizing the logical notions of truth and referentiality in language (for discussion, see Givón 1972b). They have been shown above to be implicit in

the semantic structure of lexical verbs; hence the development of sentence modals from verbs must be an expected, natural process.

(b) The time-axis arrangement of presuppositions and implications: this portion of the internal semantic structure of verbs turns out to be the very embryo of our tense system. The DEICTIC notion 'privileged member of the set T (time)', denoting TIME-OF-SPEECH, lies at the very heart of the conceptualization of time in language. In the semantic structure of verbs, this notion is already present in an 'embryonic' form, as the time-axis or action-time of the verb. Further, as shown in Givón 1972c, the past tense in language involves the modality Certain—which corresponds well to the notion of PRESUPPOSITION. Implications, on the other hand, pertain to future time relative to time-of-speech. When combined with the modal operator Uncertain/Possible, they yield our concept of 'future'.

(c) The modality Negative must be a semantic primitive, yet it most often arises in language from the Negative inherent in the semantic structure of verbs, where it may pertain to either their presuppositions or implications. Verbs with neg-presuppositions most often give rise to Future modals, while those with neg-implications most often give rise to Past or Negative modalities.

5.2. SOME NOTES ON THE POLYSEMY OF C-VERBS. In English, a relatively small group of verbs have both an M-verb and C-verb sense. The list includes:

- (131) *remember, forget, learn, pretend, regret, hope, agree, decide, be afraid.*

The significance of this particular grouping is doubtful, especially because in other languages the list may be more extensive (see below). Several of the verbs listed in 131 may be dismissed from further discussion, since no semantic difference can be shown between their C-verb and M-verb sense. One of those is *pretend*: both its *that*-S and *to*-S complement forms are equally neg-factive, not just neg-implicative. This is evident from the infelicities in

- (132) John was sick, *and he pretended to be sick.
 *and he didn't pretend to be sick.
 *and he pretended that he was sick.
 *and he didn't pretend that he was sick.

The verb *pretend* is thus a C-verb with a special syntactic condition changing the *that*-S complement to an infinitival complement form (including equi-NP-deletion) when the subject of the embedded sentence is identical with the subject of *pretend*.

A similar situation holds with the factive C-verb *regret*. It remains factive in its *to*-S complement form, as may be seen from the infelicities in

- (133) John didn't tell Marge about his affair with Sheila,
 *and he regretted that he told her about it.
 *and he didn't regret that he told her about it.
 *and he regretted having told her about it.
 *and he didn't regret having told her about it.

Here again, an equi-subject situation induces the (optional) change in the surface form of complementation, but the semantics of *regret* remain unchanged.

The same is not true with the other verbs listed in 131. Their M-verb senses

are different, often in subtle but interesting ways, from their C-verb senses. Of this list, the three FACTIVE verbs *learn*, *remember*, and *forget* exhibit the very same shift of meaning, to an OBLIGATION sense, as in these sentences:

- (134) John forgot to do the dishes on time.
 John remembered to do the dishes on time.
 John learned to do the dishes on time.

These changes may be summarized as in Table 5.

| verb | timeless presupposition | presupposition about subject's knowledge before time-axis | implication about subject's knowledge after the time-axis |
|----------------------|----------------------------|---|---|
| <i>learn that</i> | [+truth] | [-knowledge] | [+knowledge] |
| <i>learn to</i> | [+obligation] | [-knowledge of obligation] | [+knowledge and performance of obligation] |
| <i>remember that</i> | [+truth] | [+knowledge at t-2] [-knowledge at t-1] | [+knowledge] |
| <i>remember to</i> | [+obligation] | [+knowledge of obligation] | [+performance of obligation] |
| <i>forget that</i> | [+truth] | [+knowledge] | [-knowledge] |
| <i>forget to</i> | [+obligation] | [+knowledge of obligation] | [-performance of obligation] |

TABLE 5

As seen from the summary in Table 5, the plus/minus signs with respect to both the presuppositions and implications of these verbs remain untouched. But in the presuppositions the sense of Truth is replaced by Obligation, and Knowledge of truth by Knowledge of obligation. In the implications, both *remember* and *forget* exchange the implication of (+/-) Knowledge with that of Performing the obligation: i.e., they have become implicative and neg-implicative, respectively. *Learn* seems to have retained the implication of Knowledge of obligation while adding that of Performing the obligation. It has thus become an implicative verb, though of a slightly different kind. It maintains a sense of HABITUAL performance of the obligation (rather than a specific performance of one specific task). Thus 135a entails 135b but not 135c:

- (135) a. John has learned to chew his food quietly.
 b. John now habitually chews his food quietly.
 c. John is this very minute chewing his food quietly.

Next, all factive C-verbs, with the single exception of *regret*, may develop a 'how-to' sense with an equi-subject condition. But in contrast with the *to*-S M-verb sense of *remember*, *forget*, and *learn* in 134 and Table 5, the 'how-to' sense is NOT implicative:

- (136) Marvin has learned (how to) speak French
 * \supset Marvin is now speaking French.
 \supset Marvin knows how to speak French.
 Mary remembered how to put her pants on
 * \supset Mary has put her pants on.
 \supset Mary knows how to put her pants on.

Most non-factive C-verbs cannot exhibit this sense, e.g.:

- (137) *John thought how to speak French.
 *John hoped how to speak French.
 *John believed how to speak French.
 *John was afraid how to speak French.
 *John was sure how to speak French.
 *John doubted how to speak French.
 *John hated how to speak French.
 *John agreed how to speak French.

The only verb in the non-factive group which seems to allow this sense is *decide*, as perhaps in

- (138) ? John decided how to speak French.

On the other hand, in English as well as in other languages, non-factive C-verbs may develop another M-verb sense—a NON-IMPLICATIVE one. In English this process is rather restricted, with the verb *think* or *consider* developing an INTENT sense, as in

- (139) I am considering doing it; I hope to do it.
 I am thinking of doing it; I am afraid to do it.

In other languages this development is less restricted. In Hebrew, e.g., the verbs 'think' and 'dream' have M-verb senses; as in

- | | | | |
|--------------|--------------|---|--------------|
| (140) | C-VERB SENSE | ⇒ | M-VERB SENSE |
| <i>hašav</i> | 'think-that' | | 'plan-to' |
| <i>halam</i> | 'dream-that' | | 'hope-to' |

In Finnish,²⁶ this process is even more extensive; factive C-verbs develop M-verb senses of OBLIGATION (often implicative), and non-factive M-verbs develop non-implicative M-verb senses, as shown in Table 6.

| VERB SENSE | STEM | SENSE AS M-VERB |
|------------|-------------------|---|
| remember | <i>munista-</i> | obligation to perform |
| forget | <i>unohta-</i> | obligation to perform |
| {perceive} | <i>huomaa-</i> | propriety of performing |
| {observe} | | |
| guess | <i>arvaa-</i> | smartness of having performed |
| understand | <i>ymmärtä-</i> | smartness of having performed |
| {doubt} | <i>epäile-</i> | fear or uncertainty about obligation or propriety |
| {suspect} | | |
| believe | <i>usko-</i> | belief in certainty of performing in future |
| {assume} | <i>oletta-</i> | expectation to perform |
| {suppose} | | |
| think | <i>ojettele-</i> | intent to perform |
| imagine | <i>kuvittele-</i> | intent to perform (with a negative invited inference) |

TABLE 6

²⁶ For this data, as well as for a stimulating discussion, I am indebted to Raimo Anttila.

To sum up, then: although one cannot predict with full accuracy which C-verb will develop an M-verb sense, one can predict with some measure of accuracy the type of M-verb which may develop from any type of C-verb. These predictions may be summarized in the following way:

- (a) Factive C-verbs tend to develop implicative, obligation M-verb senses.
- (b) Non-factive C-verbs tend to develop non-implicative (intensional) M-verb senses.
- (c) Factive C-verbs tend to allow the development of 'how-to' senses.
- (d) Non-factive C-verbs tend to reject that development of 'how-to' senses.

So far as (a) and (b) above are concerned, the modality of the complement-S, whether Certain or Uncertain, seems to persist whether the verb is employed in its C-verb or M-verb sense. The significance of (c) and (d) above will require further study.

6. CONCLUSION. I have shown that many of the presuppositions and all the implications of verbs must be taken relative to the time-axis; presuppositions pertain to the time preceding it, implications to the time following it. The semantics of M-verbs and C-verbs have been analysed in the light of these findings. In verbs, the time-axis corresponds to ACTION-TIME. When verbs become tense markers (sentential modalities), the addition of a deictic notion converts the time-axis into TIME-OF-SPEECH.

While the notion of presupposition in language closely corresponds to the modal notion Certain or Necessary, implications often involve the modality of Uncertainty or Possible. Further, presuppositions and implications most often correspond to our notions of Past and Future, respectively. Our linguistic concepts of certainty (truth) and uncertainty (possibility) are thus shown to be closely bound with our concept of time: the past is considered as fact, the future as possibility.

Since the division of time before and after a time-axis is already present in our verbal system, and since the primitive modals Certain, Negative, and Negative-certain are also shown to be present in the semantic structure of verbs, the development of tense-aspect-modals from M-verbs is a highly natural process. I have shown above that this development involves a high degree of predictability, so that it is possible to infer, from the specific presuppositions and implications of an M-verb, the type of sentence modality likely to evolve from it. The tense-aspect system in language thus represents a natural outgrowth of our verb system. It involves the introduction of a notion of deixis, by which the time-axis of verbs becomes the deictically-anchored time-of-speech. The set-theoretic designation of a privileged member in a set 'T' (time) remains common to both the time-axis of verbs and action-time of sentences. Finally, it has been shown that the study of diachronic processes may serve as a useful tool in validating and illuminating synchronic semantic descriptions.

REFERENCES

- BARON, N. 1972. Language acquisition's role in diachrony: the evolution of English periphrastic causatives. Paper read at the Second California Linguistic Conference, UCLA.

- BENVENISTE, E. 1968. Mutations of linguistic categories. Directions for historical linguistics, ed. by W. P. Lehmann and Y. Malkiel, 83-94. Austin: University of Texas Press.
- GIVÓN, T. 1971a. Historical syntax and synchronic morphology: an archaeologist's field trip. Papers from the 7th Regional Meeting, Chicago Linguistic Society, 394-415.
- . 1971b. On the verbal origin of Bantu verb suffixes. *Studies in African Linguistics* 2.145-63.
- . 1972a. Forward implications, backward presuppositions, and the time axis of verbs. *Syntax and semantics*, I, ed. by John P. Kimball, 29-50. New York: Seminar Press.
- . 1972b. Studies in ChiBemba and Bantu grammar. *Studies in African Linguistics*, supplement 3.
- . 1972c. Opacity and reference in language: an inquiry into the role of modalities. *Syntax and semantics* II, ed. by John P. Kimball, 95-122. New York: Seminar Press.
- HERZBERGER, H. 1971. Setting Russell free. Paper read to the Philosophy Colloquium, University of Western Ontario, Toronto.
- KARTTUNEN, L. 1971a. The logic of English predicate complement constructions. To appear in French translation) in *Langages*.
- . 1971b. Some observations on factivity. *Papers in Linguistics* 4.55-69.
- KIPARSKY, P., and C. KIPARSKY. 1968. Fact. *Progress in linguistics*, ed. by M. Bierwisch and K. E. Heidolph, 143-73. The Hague: Mouton.
- MORGAN, J. 1969. On the treatment of presupposition in transformational grammar. Papers from the 5th Regional Meeting, Chicago Linguistic Society, 167-77.
- NEUBAUER, P. 1971. The 2nd surface verb *pretend*. University of Michigan. Mimeo.
- PERLMUTTER, D. 1970. The two verbs 'begin'. *Readings in English transformational grammar*, ed. by R. Jacobs and P. Rosenbaum, 107-19. Waltham, Mass.: Ginn.
- TAKIZALA, A. 1972. Focus constructions: the Kihung'an case. *Studies in African Linguistics* 3.259-87.

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