

SEMANTIC PROPERTIES OF ENGLISH MATRIX VERBS
PERTINENT TO
SENTENTIAL COMPLEMENT SELECTION

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This paper, based on my dissertation (Verspoor 1990), deals with the selectional properties of English matrix verbs pertinent in complement selection. After explaining the rationale of this study, I will present a semantic framework for the analysis of complement-taking matrix verbs, based on Palmer (1986). According to this semantic analysis, matrix verbs that belong to the same semantic category may select among structures that are syntactically different (see 1 a and b) and that matrix verbs that belong to different semantic categories may select structures with similar surface structures (see 2 a and b):

- (1) a. I believe that he is guilty (finite clause)
b. I believe him to be guilty (non-finite)
- (2) a. I saw him walk (epistemic verb)
b. I made him walk (deontic verb)

I have found that these apparently paradoxical facts may be explained by the fact that, in addition to the semantic class to which the matrix verb belongs, the type of causal relationship (based on Searle's theory of intentionality) between the action/state expressed by the matrix verb and its complement is pertinent in complement selection.

Before starting this study, I had noticed that many constructions containing an imperative, a modal auxiliary, or a subjunctive verb had alternate to infinitive structures:

- (3) He went to the store so that he might buy some milk/ to buy some milk
- (4) Mr Johnson is the man whom you should speak to/ to speak to
- (5) I asked what I should do/what to do
- (6) It is necessary that he go/for him to go

Because many to infinitive structures may alternate with finite clauses containing modal auxiliaries or subjunctive verbs, I speculated that the to infinitive might be related to the use of modal auxiliaries. I found two distinct categories, the to infinitive after verbs expressing a belief or opinion behaving differently from the to infinitive after verbs of planning. A 'belief' matrix verb often selects a to be complement, which may sometimes alternate with a small-clause type of complement. Also, such a complement usually refers to a state of affairs that occurs before or at the same time as the psychological mode expressed by the main verb.

- (7) a. I believe that he is a thief
 b. I believe him to be a thief
- (8) a. I believe that he has been a thief
 b. I believe him to have been a thief
- (9) a. I consider him to be a thief
 b. I consider him a thief

Verbs of planning, on the other hand, select infinitives that refer to a time that is in the future relative to the time expressed by the main verb. Also, such verbs do not usually select small clause complements.

- (10) a. I plan to go home tomorrow
 b. I plan to be a doctor
 c. * I plan a doctor

On the strength of these differences, I divided the verbs complemented by to infinitive constructions into two groups: those that express an opinion and those that express a volitional action. Then I sought a clearer definition of modality in Palmer's work (1986), one of the most recent and extensive studies on mood and modality. I noticed that my postulated categories of 'opinion' and 'volitional action' coincided with Palmer's main modal categories:

- epistemic: those that report a state of affairs
- deontic: those that report a volitional action and those that evaluate an idea

This correlation encouraged me to further investigate the idea that a to infinitive structure might indeed be regarded as a modal marker, very much like an

auxiliary of modality or a subjunctive verb. Actually, not only the to infinitive but also the plain infinitive and -ing forms often occur in English where other languages might use a subjunctive form (Palmer 1986: et passim). For example, in many languages, verbs of perception--which in English may be followed by a plain infinitive construction (I saw him walk)--are modal predicators (Palmer 1986: 165). Also, Palmer's evaluations, which include verbs such as regret, can be followed by gerunds in English (119-121). Moreover, many, but not all, non-finite structures have alternate that clause structures, and many, but not all, that clause structures have non-finite alternates. Therefore, I decided to include plain infinitive, -ing, and finite (indicative, modal, and subjunctive) clause complement structures in my study.

The following examples show that all the structures mentioned may be selected by epistemic as well as deontic matrix verbs.

Finite that clauses:

Epistemic He announced that she had arrived on time
He believed that she had arrived on time

Deontic He insisted that John arrive on time
He told John that he should arrive on time

To infinitive constructions:

Epistemic He believed himself to be on time
He claimed to have arrived on time
He pretended to have arrived on time

Deontic He wished (for John) to arrive on time
He ordered John to arrive on time
He promised John to arrive on time

Plain infinitive constructions:

Epistemic He heard her leave on time
Deontic He made her leave on time

Ing constructions:

Epistemic He saw Mary walking home
He remembered Mary singing

Deontic He continued walking fast
 He advised walking slowly
 He enjoyed walking
 He considered walking
 He imagined walking
 He regretted walking

Small clause constructions:

Epistemic He considered them late
 He pronounced them man and wife

Deontic He let them in the house

The terms epistemic and deontic are quite common in linguistics. Palmer, however, uses each in a much wider sense than usual and they are therefore discussed in more detail. Palmer argues that besides the commonly recognized notion of weak to strong possibility, the epistemic category should include expressions that indicate the type of evidence a person has for what he says. Therefore epistemic modality should include evidentials such as 'hearsay' or 'report' (the Quotative) and the evidence of the senses (51), which are "devices for the speaker to indicate that he wishes to modify his commitment to the truth of what is being said" (57).

Judgments and evidentials, each in turn, have two subcategories (confidence/inference and hearsay/other perception respectively) so that there are four ways to indicate that the speaker or reporter is not presenting what he is saying as a fact. Judgments are propositions that express the notions of possibility, probability, and necessity (in the sense of strong possibility), indicating that the speaker is speculating about a state of affairs (confidence) (see example 11) or that the speaker is presenting a state of affairs as a deduction (inference) (see example 12). Because English does not express these categories in main clauses, Palmer illustrates them with that clauses after verbs or adjectives expressing modality.

- (11) It is possible that .../ I think that ...
 (12) It is to be concluded that.../ I conclude that ...

Evidentials are propositions qualified in terms of the available evidence with which the speaker may indicate that he has been told about a state of affairs

(hearsay) (see example 13) or that a state of affairs is a matter only of appearance, based on the evidence of other possibly fallible senses (other perception) (see example 14).

(13) It is said that .../ X said that ...

(14) It appears that ...

Palmer (96) uses the term 'deontic' also in a wider sense than usual. He includes the types of modality characterized by Jespersen (1924: 320-1) as "containing an element of will," which he groups into three general categories (directives, commissives, and volitives). He also adds a fourth, evaluatives, unrelated to willingness. Palmer notes that--besides being subjective propositions--directives, commissives, and volitives are always related to the future because at the time of speaking a speaker can initiate only future action (97).

Directives are statements meant to initiate action by others or the speaker, including imperative statements, which express in the most neutral way the notion that the speaker is favorably disposed towards an action.

- (15) a. Leave (command or 'mand')
b. John may/must leave (permission/obligation)

Commissives are statements with which the speaker commits himself to an action and range from promises to threats, with the difference between these two determined by what the speaker wants.

- (16) a. I will leave now (promise or threat)
b. You shall go to the circus (promise)

Volitives are statements with which a speaker expresses wishes and feelings and include attitudes of fear, hope, and regret (Palmer 1986: 116-118).

- (17) May he arrive on time (wish)

Evaluatives are statements with which a speaker expresses attitudes towards known facts. They include expressions of failure, expectation, surprise, disappointment, approval, disapproval, and regret (Palmer 1986: 119).

- (18) That he should do such a thing!
(surprise, annoyance, regret)

A consideration of the English language indicates that matrix verbs expressing all the kinds of modality that Palmer has established can select both finite and non-finite complements (to infinitive, plain infinitive, -ing form, and small clause [NP XP] complements) and that non-finite complements commonly alternate with subordinate clauses.

TABLE 1

 EPISTEMIC

A Judgments

i Confidence

I believe that he is honest
 I believe him to be honest
 I consider him honest

ii Inference

I found that he was guilty
 I found him to be guilty
 I judged him guilty

B Evidentials

i Hearsay

He claimed that he was sick
 He claimed to be sick

ii Other Perception

I saw that he walked home
 I saw him walk home

DEONTIC

A Containing an element of will

i Directive

I told John that he should leave
 He permitted John to leave
 He made John leave

ii Commissive

He promised that he would leave
 He threatened to leave

iii Volitives

He hopes that he will leave soon
 He hopes to leave soon

B Not containing an element of will

He regretted that he had left early
 He regretted having left early

Because I found that Palmer's semantic classes themselves can not account for a choice among the alternate complement structures, I decided to examine Searle (1983), whose approach "provides a useful semantic framework for the discussion of modality" (Palmer 1986: 13). Besides noticing a great many similarities between Palmer's modal and Searle's Intentional categories, I found that several of Searle's observations--intentionality in perception and action; similarities among commissives, directives, and intentions; distinguishing prior intention from intention in action; and distinguishing between direction of causation--might be pertinent not only to understanding modality but also to complement selection.

What became the crucial argument to my study, however, is Searle's postulate that there is 'causation' in every Intentional state as I found that a non-finite structure is possible only when there is a causally relevant relationship between the action or state expressed by the matrix verb and state of affairs, event, or action expressed by the complement clause. For example, in English, the choice between a finite versus a non-finite complement clause may depend on whether or not the subject of the matrix verb has a direct causal relation to the event expressed in the complement: In (21 b) the subject can directly prove the state of affairs expressed by the complement, but in (21 c) the subject cannot.

- (19) a. The doctor/test proved that she was pregnant
 b. The test proved her (to be) pregnant.
 c. * The doctor proved her pregnant.

Also, in English, the type of complement after a verb of perception indicates whether the perception is directly caused by the event expressed in the complement clause or not. A finite clause may express that there was indirect evidence (causation). A non-finite complement is possible only when there is direct perception.

- (20) a. I saw him read a book
 b. * Because the light was on, I saw him read a book

Searle uses the term 'causation' very broadly. In many instances, his use of 'caused by' could be interpreted as 'determined by' or 'brought about by.' Departing from standard theories of causal explanation (which I will not go into), Searle (119-124) argues that 'intentional causation' is involved in all cases of intentionality because we can directly experience the causal relations whenever we perceive or act. For example, in perception the object directly causes the perceptual experience; in action, our mental state directly causes the action.

The close semantic connection between action and perception is reflected in the complement structures of the relevant verbs; both may be followed by -ing structures:

- (21) a. I see him walking
 b. I avoid walking

Causation--which is part of the content of an action or perception experience (130)--is more intimately related to action and perception than, for example, to 'prior intentions' and 'belief'. Searle points out that 'intentions in action' should be distinguished from 'prior intentions.' An intention in action might be expressed with "I am doing A," whereas a prior intention might be expressed with "I will do A" or "I am going to do A." In the example "I suddenly hit a man," the intention was in the action, because it was not premeditated. Therefore, there was no prior intention (84). In English, a present 'intention in action' is expressed by means of a present progressive and two simultaneous 'intentions in action' might be illustrated with I continued writing, in which the complement of the matrix verb also is the -ing form.

If my assumption that a syntactic form is indicative of its semantic function is correct, then two of

Searle's observations--'immediateness' and 'conditions of satisfaction that are met'--are important criteria for complement selection. With a verb of perception, 'immediateness' means that the action of 'seeing,' 'hearing,' or 'feeling' and the action/event expressed in the complement are simultaneous. 'Conditions of satisfaction that are met' imply implicativity. In English, verbs of perception may be followed among other structures by an NP + plain infinitive or -ing form. So are other verbs of Intentional reports that show immediate causation (simultaneity and implicativity). On the other hand, when verbs of Intentional state or linguistic report imply that the action will take place at a future moment, and are therefore inherently [- immediate], they are usually followed by a to infinitive.

- (22) a. I see him walk [+ imm]
 b. I see him walking [+ imm]
- (23) a. I avoid walking [+ imm]
 b. I refuse to walk [- imm]
- (24) a. I made him walk [+ imm]
 b. I told him to walk [- imm]

Searle states that with a prior intention an agent acts on his intention, carries out his intention, or tries to carry it out; but 'intentions in action' cannot be separated into 'intentions and actions' (84). It seems to me that the feature relevant in complement selection [immediate] is inherent to the distinction between 'prior intention' and 'intention in action.' For example, refuse would imply a prior intention (referring to a future action; [- imm]) and avoid an intention in action (referring to a simultaneous non-action; [+ imm]).

- (25) a. I refuse to go [- imm] prior intention
 b. I avoid jogging [+ imm] intention in action

A belief about a state of affairs consists of two separate entities--the belief and the state of affairs--and the conditions of satisfaction are met only when the state of affairs, a separate entity, is as I believe it to be. The close semantic connection between belief and prior intention, the fact that both have a less immediate connection to a state of affairs than perception or an intention in action, is also reflected in the complement structures of the relevant verbs; both may be followed by -to infinitive structures:

- (26) a. I believe him to be sick [- imm]
 b. I told him to walk [- imm]
- (27) a. I saw him walking [+ imm]
 b. I avoid walking [+ imm]

'Prior intention' and 'memory' are also related. Both are representations (in the literal sense of 'present again'). For example, in "I remember seeing a flower" I represent (present again) the event "I see a flower" and implies that there was an event of seeing the flower and that this event now causes my remembrance. In "I intend to raise my arm," I represent the event "I am raising my arm" and implies that there (probably) will be an event of raising my arm (97). The difference in syntactic structures after verbs expressing a prior intention or a memory (which is very much like perception and imagination) may be explained by the fact that a prior intention represents a possible future event and is therefore [- immediate]. On the other hand, a remembrance is caused immediately by a mental image re-presenting an actual past event.

- (28) a. I intend to raise my arm [- imm]
 b. I remember raising my arm [+ imm]

Searle also points out that there is a close connection between 'intentional actions' and what one can tell people to do. When one gives orders, one orders people to perform intentional actions; one can only order people to do things that they can do intentionally (81). The fact that to infinitives occur to report prior intentions as well as orders supports this close semantic connection:

- (29) a. I want to go (report of prior intention)
 b. I want you to go (report of order)
 c. I promise you to go (report of promise)
 d. * I want going

According to Searle, mental acts are similar to physical acts. They are different only in that a purely mental event, instead of a bodily movement, occurs as a condition of satisfaction. For example, if I intend to form a mental image of the Eiffel tower and I do, the relevant portion of the intention in action will be that this intention in action causes me to have a mental image of the Eiffel tower (103). Because forming a mental image is an intention in action and involves

no prior intention, the causation is [immediate]. Again, the similar syntactic complement structures support this hypothesis.

- (30) a. I imagined climbing the Eiffel Tower
 [+ imm]
 b. I considered climbing the Eiffel Tower
 [+ imm]

Evaluatives, as defined by Palmer, express an attitude towards an actual present or past event or state of affairs. Verbs reporting these evaluatives often select an -ing complement, as do other reports of actual present or past events or states of affairs. Again the feature [immediate causation] seems to be a pertinent criterion in complement selection. It is either the actual event or state of affairs, which occurs at the same moment as the utterance is made, or the mental representation of the event or state of affairs that directly causes the emotion.

- (31) a. I regretted stepping on your toe
 [+ imm caus]
 b. I remember stepping on your toe
 [+ imm caus]
 c. I saw him stepping on your toe
 [+ imm caus]

In addition, verbs reporting attitudes towards possible future events may select an -ing complement:

- (32) a. I enjoy swimming
 b. I despise swimming
 c. I prefer leaving

Also, verbs reporting evaluations of (rather than attitudes towards) future events may select an -ing complement:

- (33) a. I considered going
 b. I advise going

Therefore, I would like to argue that evaluatives should include not only attitudes towards an actual present or past event but also evaluations (by the speaker or listener) of possible future events.

In conclusion, I have argued that once we recognize Searle's notions of [direct causation], which may be [\pm immediate], we can account for the fact that

verbs belonging to the same semantic class may select among alternate structures. Table 2 gives a brief overview of lexical verbs selecting non-finite complements. It suggests that the primary criterion in complement selection might be [causation]. When the logical relationship between the Intentional state/act expressed by the matrix verb and the action/event/state of affairs expressed by the complement is one of direct and immediate causation, the matrix verb selects either a plain infinitive or an -ing complement; if the logical relationship is direct, but non-immediate, the matrix verb selects a to infinitive.

TABLE 2

Int. state Int. action	matrix verb	imm. caus	non-finite complement
DEONTIC CATEGORIES			
intention in action	<u>continue</u>	+	<u>-ing</u>
causation	<u>make</u>	+	plain inf
causation	<u>cause</u>	-	<u>to</u> inf
prior intentions	<u>intend</u>	-	<u>to</u> inf
directives	<u>tell</u>	-	<u>to</u> inf
commissives	<u>promise</u>	-	<u>to</u> inf
volitives	<u>wish</u>	-	<u>to</u> inf
EPISTEMIC CATEGORIES			
perception	<u>see</u>	+	plain inf <u>-ing</u>
memory	<u>remember</u>	+	<u>-ing</u>
emotion	<u>regret</u>	+	<u>-ing</u>
belief	<u>consider</u>	+	NP XP
declarations	<u>pronounce</u>	+	NP XP
assertions	<u>claim</u>	-	<u>to</u> inf
belief	<u>believe</u>	-	<u>to</u> inf

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