TENSE AS A SOURCE OF INTENTIONAL AMBIGUITY*

INTRODUCTION

This paper consists of arguments in support of the following three claims:
I. that the future and past tenses are opacity-creating operators;
II. that the items that can have either a transparent or opaque reading with respect to a tense are not restricted to nominal constituents (noun phrases with nominal heads), but include other constituents as well, in particular tensed subordinate clauses;
III. that the transparent-opaque distinction is not generally representable by varying the scope of operators.

1. THE OPACITY OF TENSES

The claim that tenses create opaque contexts is not new, but it is not frequently made, nor have the consequences that flow from it for the formal semantics of natural language been adequately explored. The intensional nature of tenses has been observed and commented on in linguistics as well as in logic (Dean, 1968, Fodor, 1976, Lemmon, 1966, Haack, 1978). However, the opacity of tenses is not uncontroversial (e.g. Needham, 1975), which justifies a demonstration that tenses pass a standardly accepted test for referential opacity, the failure of substitution of identicals, i.e. the inference rule that expressions which denote the same object are mutually substitutable salva veritate within sentences.

A valid inference based on this rule is illustrated in (1).

(1) a. John is looking at the President.
    b. The President is Jimmy Carter.
    c. John is looking at Jimmy Carter.

Substitution of identicals is generally valid in non-complex, simple present or present progressive sentences with extensional verbs. Before going on to illustrate cases where substitution is invalid due to tense alone, I wish to adopt the following useful definitions of terms from Klein (1979, p. 74):
DEFINITION 1. A sentence $\phi$ receives an opaque reading with respect to a singular term $\alpha$ iff SUB is invalid with respect to $\alpha$ on that reading.

... 

DEFINITION 3. If a sentence $\phi$ can receive an opaque reading with respect to a singular term $\alpha$, then there is also a reading of $\phi$ on which SUB is valid with respect to $\alpha$. This is the transparent reading of $\phi$ with respect to $\alpha$.

Klein also has a definition of opaque context, but as stated it is only applicable to complements of verbs of mental attitude that he studies.

DEFINITION 2. Let $\xi$ be a verb which takes sentential or verbal complements, and let $\alpha$ be a singular term. If there is a sentence $\phi$ such that the only occurrence of $\alpha$ in $\phi$ is within the complement of $\xi$, and $\phi$ has an opaque reading with respect to $\alpha$, then the complement of $\xi$ is always an opaque context.

This definition would have to be broadened considerably in order to include the different linguistic items that are considered to create opaque contexts. In addition to past and future tenses, they are certain sentential adverbs (possibly, necessarily), certain verbs with prepositional objects (dream about, look for), certain direct object verbs (seek, imagine), and verbs of mental attitude (believe, want).

As examples of failure of substitution due to the future tense alone, consider the following:

(2) a. John will receive the best selling book of the month.
   b. The best selling book of the month is '...'.
   c. John will receive '...'.

(3) a. John will marry the best looking girl in the world.
   b. The best looking girl in the world is Miss World 1980.
   c. John will marry Miss World 1980.

The inference from (a) and (b) to (c) is not valid in either of the cases above, even though receive and marry are extensional verbs, and even though both (a) and (b) are taken to be true relative to the same point of reference, $t_0$. Substitution fails because there is a reading of (a) on which 'the best selling book of the month'/'the best looking girl in the world' refers not to the entity fitting the description at the present, but to the entity fitting the description at the future time of reception and marrying respectively. But the identity statement (b) establishes a present identity which need not be a future one, 'the best selling book of the month' in (2a) and (2b) may refer to different entities, hence the invalidity of (c).

Another example of failure of substitution is (4).