Chapter 2: The Form of the Semantic Theory

Goal of a semantic theory: to characterize a speaker’s semantic knowledge (including “the speaker’s knowledge about the connection between language and the world” (p. 31)).

Why an Absolute Semantics?

- Structural Semantics

Maps NL expressions onto expressions of some “representational language” which, e.g., eliminates ambiguity and provides entailment and synonymy relations.

(Citing Lewis 1972): “...what we have at best is a mapping from one system of notation onto another” but no indication of “what the system of notation is about.” (p. 29)

- Model-Theoretic Semantics

Maps NL expressions onto sets of possible worlds, sets of possible individuals, etc.

“[Model-theoretic semantics] fails, because it never makes the connection between language and the world; at best it gives us a mapping from expressions of a given language onto certain model-theoretic objects.” (p. 31)

- Absolute Truth-Conditional Semantics (T-theory)

Gives meaning of NL expressions by stating their truth conditions. Takes the form of a series of axioms by which biconditional T-theorems can be derived.

Provides language-world connection via axioms for terminal nodes.

Interpretive vs. Non-Interpretive T-Theories

“Snow is white” is true iff snow is white (interpretive) vs. “Snow is white” is true iff grass is green (non-interpretive).

We are only interested in interpretive T-theories. (Further discussion: Larson & Segal 1995, Foster 1976)

Modest vs. Robust Truth Theories

A robust semantic theory must “explain the abilities that underlie our semantic competence” (p. 38 citing Dummett 1975, 1991). While a T-theory with T-theorems like “Snow is white” is true iff snow is white can tell us that “snow” refers to snow, it does not tell us about the knowledge we use to identify snow, therefore it is a modest, not a robust, semantic theory.

Modest and robust T-theories “are theories of the same phenomenon at different levels of abstraction and idealization” (p. 39). Nothing prevents us from developing the modest part of the theory while others work in lexical semantics, NLP, psychology, etc. to develop the robust part, and then combining the two.
Example of a T-Theory

Syntax
S → S1 and S2
S → S1 or S2
S → it is not the case that S1
S → NP VP
NP → Dick, Sally
VP → leaps, walks

Semantics
Terminal:
Val(x, “Dick”) iff x = Dick
Val(x, “Sally”) iff x = Sally
Val(x, “leaps”) iff x leaps
Val(x, “walks”) iff x walks

Nonterminal:
Val(True, [S NP VP]) iff, for some x, Val(x, NP) and Val(x, VP)
Val(x, [α β]) iff Val(x, β), where α ranges over categories and β ranges over categories and lexical items
Val(True, [S S1 and S2]) iff Val(True, S1) and Val(True, S2)
Val(True, [S S1 or S2]) iff Val(True, S1) or Val(True, S2)
Val(True, [S it is not the case that S1]) iff it is not the case that Val(True, S1)

Production Rules
(1)
\[ \ldots \alpha \ldots \]
\[ \alpha \text{ iff } \beta \]
\[ \ldots \beta \ldots \]
(2)
\[ \Phi \text{ iff for some } x, x = \alpha \text{ and } \ldots x \ldots \]
\[ \Phi \text{ iff } \ldots x \ldots \]
Psychological Evidence for the Nature of Semantic Knowledge

We can appeal to psycholinguistic considerations in grounding a particular version of semantic theory. Suppose we have two T-theories, T1 and T2, that are equally successful in characterizing a speaker’s knowledge.

T1

\[ S\ yick\ walks \] is true iff Dick walks.
\[ S\ Sally\ leaps \] is true iff Sally leaps.
\[ S\ yick\ sings \] is true iff Dick sings.

T2

(1) Val(x, “Dick”) iff x = Dick
Val(x, “Sally”) iff x = Sally

(2) Val(x, “walks”) iff x walks
Val(x, “leaps”) iff x leaps

(3) Val(True, [S NP VP]) iff, for some x, Val(x, NP) and Val(x, VP)

Now suppose we observe a speaker acquire (or lose) the ability to understand and generate the following sentences, apparently at the same time:

- Dick walks.
- Sally walks.
- Jane walks.
- Spot walks.

Assuming T1, we can only postulate that the speaker suddenly acquired (lost) four different rules. Assuming T2, we can postulate that the speaker acquired (lost) a single rule. T2 is the empirically preferable theory. (Similar case study: Semenza & Zettin 1989)

Do T-Theories Display Senses?

A T-theorem may not state sense, but it can certainly “display” it. A speaker not only knows the T-theorems of a T-theory, but he also knows that he knows the theorems, he knows “that he is representing them in a way that displays a certain sense,” and he knows that “the way we package our claims can radically affect the way people behave” (p. 45). In other words, a sort of “second-order” semantic knowledge can perform the duties of metalanguage sense.
A Word on Predication

The semantic value of a predicate (“walks,” “leaps”) depends on its sentential context. “Predicates do not refer to their extensions; rather, their senses specify rules of classification which are applied to the referent of the subject expression” (p. 46).

Justification: we would need to refer to the classification rule sometime anyway (lest we run into a “third man problem”), so we might as well bypass extensions and let the axioms invoke the rules directly.

\footnote{If predicates are treated as extensions, then there must be some predicate “is an element of” which relates the extension of a subject to the extension of the predicate. This predicate too must have an extension, and its elements must also be related to it by some sort of membership predicate. This predicate also must have an extension, and its elements must also be related to it by some sort of membership predicate... \textit{ad infinitum}.}