Chapter 5: The B-Theory Semantics

5.1 The Basic Theory

Truth-conditions need to be free of tense, A-series predicates like 'past' and 'future,' and temporal indexicals like 'now' and 'today' (metalinguage “is” is to be read as a tenseless copula):

\[
\text{Val}(\text{True, “Fred is hungry”}, t) \text{ iff Fred is hungry at time } t
\]

\[
\text{Val}(\text{True, “Fred was hungry”}, t) \text{ iff, for some time } t' \text{ earlier than } t, \text{ Fred is hungry at } t'
\]

\[
\text{Val}(\text{True, “Fred will be hungry”}, t) \text{ iff, for some time } t' \text{ later than } t, \text{ Fred is hungry at } t'
\]

To account for differences between present perfect and simple past tenses and for complex tenses like future and past perfect, we can follow Riechenbach (1947) and introduce “reference times” into our T-theorems (S= speech time, R= reference time, E= event time):

\[
\text{Val}(\text{True, “Fred is hungry”}, S, R, E) \text{ iff } S=R \text{ and } E \text{ overlaps with } S/R \text{ and Fred is hungry at } E
\]

\[
\text{Val}(\text{True, “Fred was hungry”}, S, R, E) \text{ iff } R=E \text{ and } R/E \text{ is before } S \text{ and Fred is hungry at } R/E
\]

\[
\text{Val}(\text{True, “Fred has been hungry”}, S, R, E) \text{ iff } S=R \text{ and } E \text{ is before } S/R \text{ and Fred is hungry at } E
\]

\[
\text{Val}(\text{True, “Fred will be hungry”}, S, R, E) \text{ iff } R=E \text{ and } R/E \text{ is after } S \text{ and Fred is hungry at } R/E
\]

\[
\text{Val}(\text{True, “Fred had been hungry”}, S, R, E) \text{ iff } E \text{ is before } R \text{ and } R \text{ is before } S \text{ and Fred is hungry at } E
\]

\[
\text{Val}(\text{True, “Fred will have been hungry”}, S, R, E) \text{ iff } E \text{ is after } R \text{ and } R \text{ is after } S \text{ and Fred is hungry at } E
\]

We can use events or event-like entities to build the rest of the semantics:

\[
\text{Val}(\text{True, } [v_P \text{ NP } I], S, R, E) \text{ iff, for some } x \text{ and some } e, \text{ Val}(e, I', S, R, E) \text{ and at}(e, E) \text{ and } x \text{ is the agent of } e \text{ and Val}(x, NP, S, R, E)
\]

\[
\text{Val}(e, [v_P I \text{ VP}], S, R, E) \text{ iff Val}(e, I, S, R, E) \text{ and Val}(e, VP, S, R, E)
\]

\[
\text{Val}(e, [v_P V], S, R, E) \text{ iff Val}(e, V, S, R, E)
\]

\[
\text{Val}(e, \text{ PRES}, S, R, E) \text{ iff } S=R \text{ and } E \text{ overlaps with } S/R
\]

\[
\text{Val}(e, \text{ PAST}, S, R, E) \text{ iff } R=E \text{ and } R/E \text{ is before } S
\]

\[
\text{Val}(e, \text{ FUT}, S, R, E) \text{ iff } R=E \text{ and } R/E \text{ is after } S
\]

\[
\text{Val}(e, \text{ PRES PERFECT}, S, R, E) \text{ iff } S=R \text{ and } E \text{ is before } S/R
\]

\[
\text{Val}(e, \text{ PAST PERFECT}, S, R, E) \text{ iff } E \text{ is before } R \text{ and } R \text{ is before } S
\]

\[
\text{Val}(e, \text{ FUT PERFECT}, S, R, E) \text{ iff } E \text{ is after } S \text{ and } R \text{ is after } E
\]

\[
\text{Val}(e, \text{ FUT IN PAST}, S, R, E) \text{ iff } R \text{ is before } E \text{ and } E \text{ is before } S
\]

\[
\text{Val}(e, \text{ FUT IN FUT}, S, R, E) \text{ iff } R \text{ is after } S \text{ and } E \text{ is after } R
\]

“The crucial thing to see in the exposition thus far is that the truth conditions have been restricted to events or times and to a linear before/after relation holding between them. In this sense the theory reflects a genuine B-theory approach to time.” (p. 81)
5.2 Extending the Theory

Aspect

“The standard move (see, e.g., Comrie 1976; Parsons 1991; Kamp and Reyle 1993) has been to regard aspect as a predicate of events” (p. 81).

\[
\begin{align*}
\text{Val}(e, \text{PROG}, S, R, E) & \iff \text{in-progress-at}(e, E) \\
\text{Val}(e, \text{CUL}, S, R, E) & \iff \text{culminates-at}(e, E)
\end{align*}
\]

Tensed Nominals

It has been argued (Enç 1986 & 1987) that NPs “have argument positions for times” (p. 82). This can be incorporated into the B-theory semantics via the introduction of a separate reference event to each noun’s lexical axiom. “There are puzzles surrounding the proper treatment of such cases… but no puzzles appear to pose special problems for the introduction of this idea into [a B-theory] absolute semantics” (p. 82).

Sequence of Tense

There are two readings available for sentences like “Mary said that Biff was ill”: one in which Biff’s illness overlaps Mary’s reporting it, and one in which Biff’s illness is before Mary’s report. To account for this, we can give such sentences T-theorems in which the relationships between E and S and between R and S are specified, but in which the relationship between E and R is not (“something much closer to vagueness than to ambiguity” (p. 84)):

\[
\text{Val}(\text{True}, \text{“Mary said that Biff was ill”}, S, R, E) \iff E \text{ is before } S \text{ and } R \text{ is before } S \text{ and Mary says at } R \text{ that Biff is ill at } E
\]

5.3 Metaphysical Commitments of the Theory

A B-theory semantics like the one above is committed to the existence of times and their standing in certain temporal relations to one another, and “to a metaphysics in which future and past temporal points can be referred to and in which they are, in some sense, just as real as the present” (p. 84).