A-Theory for Tense Logicians

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Let us call "tense logic" the programme of explaining tense in natural languages by means of a model theory similar in structure to possible worlds semantics for modality. This programme would make the following claims.

1) Tense is best represented formally by intensional sentential operators which should be read as "it was the case that" and "it will be the case that".

2) These operators should be treated similarly to modal logic's "diamond", or "it is possible that", operator. In particular, they should be analysed quantificationally — something like this: "it was the case that there are dinosaurs" is true iff there is a past time t such that "there are dinosaurs" is true-at-t. Unmodified object-language sentences also get this kind of treatment. They are treated as implicitly present tense: "there are dinosaurs" is true iff there is a present time t such that "there are dinosaurs" is true-at-t.

The analogy between time and modality that tense logic exploits is a controversial one. Gareth Evans (1985) has objected that it is weakest just where the tense logicians needs it to be strongest: in the analysis of truth in terms of truth-at-a-time. What I am going to do is offer the tense logician a knock-down rebuttal to any Evans-style argument. It will be up to the tense logicians to decide whether they want my answer.

Evans's argument centers around the crucial concept (for the tense logician) of truth-at-a-time, and is an argument by alternatives: Evans considers three readings of "true-at-t", T_1, T_2, and T_3, which he considers to exhaust the field, and each of which he believes to be problematic. In each case, the problematicity comes down to the reading's failing to preserve the analogy between time and modality which motivates tense logic. T_1 appears to be the reading that Evans himself believes to be analogous to truth-at-a-world; but he also believes that it cannot be applied in the temporal case without becoming enmeshed in problematic relativism about truth, and that this constitutes an important difference between time and modality. T_2 makes tense logic more like a supervaluational semantics for vague language than like modal logic. T_3 involves a "hitherto unknown form of embedding" (Evans 1985, p. 357), hence, *a fortiori*, one not known from the prior example of modal logic.

The details of Evans's trilemma are not important for my purposes, for Evans overlooks what seems to me to be an obvious way of reconstructing tense logic which cannot have any problem

of this form. Let the tense logician say not that time is like modality, but that time *is* modality. More precisely, let the tense logician replace all talk of truth-at-a-time with talk of truth-at-a-world.

The simplest way of doing this is to imagine that there is a fact of the matter of what time it is at each world. Each world has, as it were, a perfectly objective clock associated with it. Or, to put it another way, each world represents (truly or falsely) some time as being present. Now construct your model theory for tense logic using the domain of not of all possible worlds, but of those that differ only in what time it is at those worlds. And replace all talk of *S*'s being true-at-*t* with talk of there being a world *w* where the time is *t*, and *S* is true-at-*w*.

There can be no Evans-style complaint against this. Whatever else may be wrong with it, the problem is not that true-at-*w* is objectionably unlike the corresponding semantic primitive of modal logic — for they are the same. Perhaps Evans would complain that "what time it is at a world" is no more intelligible than "true at a time". But that is not the case. Given certain assumptions in the metaphysics of time, it is easy to explain.

In my (2002), I characterised the A-theory as the view that there are intrinsic "A-properties" of pastness, presentness, and futurity, and that it is in virtue of having such properties that things in time are past, present, or future. I imagined a continuum of such properties, stretching from the distant past to the distant future, as if — as in Bigelow's metaphor (1991, p. 6) — past times were coloured in deeper and deeper shades of blue, and future times in deeper and deeper shades of red.

Possible worlds might differ in how the A-properties are distributed. It might be that there is a world much like ours, except the events of 50 BC have the property of presentness, and events thereafter are increasingly future (and events prior to 50 BC are increasingly past, though not to as great a degree as in our world). Such a world would be reasonably described as "a world in which the time is 50 BC". So, the tense logician can say that *S* is true-at-*t* iff there is a world *w* where *t* has presentness, and *S* is true-at-*w*. This suffices to answer Evans: the A-theory is at least intelligible — and therefore, truth-at-at-time is too.

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References

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