Eternalism and Temporalism Revisited

1. When Essays 1 and 2 appeared, it was an open question whether the tenses were best seen as operators or as contributing to the binding of temporal variables. On the latter alternative, a sentence like

1. Mary left

means something like one of

1.1 For some t before this act of speaking/thinking, Mary leaves at t
1.2 For some t before now, Mary leaves at t.

If so, one thinks, uses of (1)–indeed, assertive uses of all declarative sentences–invariably say something whose truth value can’t change over time. For if (1) means something like (1.1) or (1.2), then a simple present tense sentence like the antecedent of

2. If Mary leaves, then so will I

presumably contains a temporal variable–its meaning is something like that of

3. Mary leaves at t.

If so, then a simple present tense sentence says something only when its temporal variable is assigned an instant or interval–and thus when it says
something, it says something about a particular time, and thus something whose truth would be fixed across time.¹

If, on the other hand, the tenses are operators, then a sentence like (1) has a logical form like

1.4 \[ P(\text{Mary leaves}), \]

where ‘P’ is a past tense operator applied to the present tense ‘Mary leaves.’ And then, argued A.N. Prior and David Kaplan, what sentences like (1) or (3) say must be able to change truth value across time. Kaplan’s argument is best known: if (1) means (1.4), then the past tense must be something that delivers a truth value on the basis of some property of what’s said by ‘Mary leaves’—presumably, it delivers the truth iff this was true. But then what’s said by ‘Mary leaves’ has to be able to change truth value over time; otherwise, as Kaplan puts it, the tense is otiose. Since tenses seem capable of iterating, as in ‘Mary will have left’, the same considerations suggest that past and future sentences won’t (unless they involve explicit temporal reference) say something temporally specific.

My sense is that these days the operator approach to tense is decidedly a minority position; for this reason if no other, the idea that what’s said is “eternally true or false” seems to be the dominant position. The most compelling reasons (to me, at least) for thinking that the tenses contribute to

¹ The argument ignores the possibility that a claim about a specific time—e.g., the claim that on 18 January 2525, I will not be conscious—is without truth value before that time. Since the debate was one about whether claims must be temporally specific, it seemed and still seems proper to ignore issues about future contingents.
something like variable binding have to do with embeddings of tenses under verbs like ‘say’ or ‘think’.² Consider the sentences

4. Schafer said that Gordon was hungry
5. Schafer will say that Gordon is hungry
6. Schafer said that Gordon is hungry.

Both (4) and (5) are ambiguous. (4) has a reading (the simultaneous reading) on which it says that Schafer said at some past t that Gordon was then (at t) hungry. It also has a reading (the shifted reading) on which it says that Schafer said at some past t that Gordon was hungry before t. Clearly these readings can be captured by understanding the tenses as involving binding, so long as we say that embedded past morphology (that is, the past tense form in (4)’s complement) sometimes doesn’t have the function of shifting us back in the past.

Treating tenses as operators, (4)’s simultaneous reading can be ascribed the form

4.1 P(Say (Schafer, that Gordon is hungry))

in which the complement sentence is in the present tense; the shifted reading is ascribed the form

² There are reasons to think that tenses involving temporal reference that don’t involve such embeddings. Examples include Barbara Partee’s observations that we often refer ‘deitically’ to times in tensed sentences (‘I didn’t turn the stove off!’ does not make the claim that there is a past time at which I didn’t turn off the stove), and that we often have something like temporal anaphora between tensed clauses (as in ‘Mary started yelling at him, and John went to his happy place’); see Partee 1984 for a collection of such examples.
4.2 \( P(\text{Say (Schafer, that } P(\text{Gordon is hungry})) \)

in which the complement is in the past. Once again, we have to say (this time in the reading captured by (4.1)) that embedded past morphology sometimes fails to shift us back in time, but this is hardly a defect relative to the eternalist treatment.

But now consider (5). It is naturally understood as predicting Schafer’s future utterance of ‘Gordon is hungry’: that is, as saying that Schafer says at some future \( t \) that Gordon is hungry at \( t \). It is also naturally understood as predicting at the time of its use that Schafer will say something about Gordon’s state at the time of its use, as in the dialogue

Rice: Tomorrow, Bush is going to ask Schafer how the cabinet members were feeling today. What will Schafer say?

Cheney: He’ll say that Rice has a headache, Chertoff is hung over, and Gordon is hungry.

On this reading, (5) used at \( t^* \) says that at some \( t \) future to \( t^* \), Gordon says at \( t \) that Schafer is hungry at \( t^* \).\(^3\) Although the mechanism controlling the interpretation of an embedded tense may be obscure, it is clear that if we take the tense to supply a temporal argument that may be either bound by a higher tense or filled by an expression picking out a time, then we can accommodate this ambiguity. But it is not clear how the view that tenses are operators on “temporally neuter” propositions can accommodate the facts.

\(^3\) Obviously there is a parallel here with the simultaneous / shifted reading of a past tense form embedded under a past tense tense.
The first reading of (5) is easy enough to get; one obtains it in the way one obtains the simultaneous reading of (4), embedding the “tenseless” ‘Gordon is hungry’ under ‘say’:

5.1 \( F(\text{Say(Schafer, that Gordon is hungry)}) \),

‘F’ is a future tense operator. But the second reading of the sentence is a complete mystery – unless we are willing to say that on this reading there is something like an implicit occurrence of ‘now’ in the complement. But why, one wants to know, should it be only in this case that the present tense ‘Gordon is hungry’ involves implicit reference to or quantification over time? Surely a more plausible account will give a uniform account of the present. But if we give a uniform account of the present and say that in certain cases it involves reference to a time, then wherever it occurs there is such reference.\(^4\)

A similar problem arises with sentence (6). A current use of it seems to represent Gordon as having said something about how Gordon currently

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\(^4\) In slightly more detail, the argument here is as follows. On the view that tense involves temporal reference and variable binding, (5) is perfectly parallel to (4): Each sentence is ambiguous between a reading on which the embedded sentence’s underlying tense marker is what its morphology indicates (past in (4), present in (5)), and a reading on which the underlying tense marker is ‘semantically vacuous’ (it simply inherits a time from the higher tense). (When the tense is ‘vacuous’ it is also assumed to inherit the morphology of the higher tense.) (4) and (5) thus suggest that while embedded tense is sometimes vacuous, the cases in which an embedded tense is vacuous are not to be identified with cases in which the present tense is embedded.

The problem a sentence like (5) poses for someone who takes an operator approach and treats (4) as sketched in the text is that their treatment of (4) in effect commits them to treating the present tense as “semantically vacuous”. (This commitment is clearly recognized – though not expressed using the terminology of semantic vacuity – by both Kaplan and Prior. (For the latter, see Chapter 1 of Prior 1969.)) But then there is no way to account for the second reading of (5) save by positing a puzzling ambiguity in the present tense.
is. (If Gordon isn’t hungry at the time you utter (6), I can say ‘Well Schafer was wrong about that’.) The standard explanation of this is that a use of (6) ascribes to Gordon a saying about an interval that includes both the time of his utterance and the time of the use of (6) itself—its truth conditions are along the lines of

6.1 For some past time t, there is an interval i that contains t and the present and Gordon said at t that Schafer is hungry during i.

But how are we to account for (6) if we treat tenses as operators on sentences constructed from (other tense operators and) temporally neutral sentences? Its surface syntax suggests, treating tenses as operators, that we represent it as (4.1)—as saying that it was the case that (Schafer says (that Gordon is hungry)). But this gives the wrong truth conditions to (6) unless we say that (here) the embedded present involves covert temporal reference. If we say that uses of (6) involve a covert ‘now’, we face the twin problems of explaining why we shouldn’t suppose that there is always reference to or quantification over times, and of explaining why there isn’t (as an operator approach would lead us to think) a reading of (6) with (4.1)’s truth conditions.\(^5\)

2. One might respond by insisting that an operator account must be correct, because the idea that the tenses involve reference to or quantification over times is psychologically implausible. So argue Francois

\(^5\) I don’t mean to minimize the difficulty in giving a non ad hoc account of how it comes to be that (6) has truth conditions along the lines of (6.1); the point is that it’s hard to find a systematic account that gets the truth conditions of (6) right without positing a temporal argument associated with tenses (and verbs, adjectives, and nouns).
Recanati and Michael Dummett, who say it’s implausible to suppose that the thoughts we express with sentences like ‘The jello is wiggling’ or ‘Mommy is here’ are temporally specific. According to Dummett this is because

[w]e think of adjectives such as ‘warm’ …as denoting properties…rather than relations between objects and times. And this goes with the way [we come to understand our language]….We do not begin by learning in what relation an object must stand to an arbitrary time for it to be warm or wet at that time…. Rather, we first learn what it is for something to be warm [or] wet….. From this we advance to an understanding of what is meant by saying of an object that it is or will be warm, etc. at some other time.  

I find this argument puzzling. Experiences occur in time and have a temporal structure –one sees one’s hand hit the glass then sees the glass hit the floor while hearing it shatter. Indeed, save in the most pathological case, when one has such a sequence of experiences, the temporal order is in some important sense part of the experience: one’s visual and aural experience represents the glass being hit and then hitting the floor while it shatters. One thinks that simply to have such an experience is to have an experience whose content is (in part) that one event occurs after another while a third occurs. The Kantian thought here is that nothing that lacks experience with such temporal representation has anything that deserves to be called experience. And if so, then anything that has the concepts necessary to think about empirically manifest properties must have experience with such temporal representation.

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If this is right, then it is plausible to say that anything that has the ability to think that the glass falls or that the floor is wet has the ability to represent and to think that the glass’s falling happened before the floor’s being wet. And to be able to think that sort of thing, I think, requires being able to think of properties and relations being had (or not had) at some points/times or during some events.

But then it seems that to gain beliefs from perception one must be in a position to appreciate that events occur in a time-like ordering – e.g., that the floor is wet during this [mom’s yelling], or after that [hitting the cup]. And if this is so, then as soon as we are able to use adjectives such as ‘warm’ we in some sense know that they are used to describe events that occur in something with an order like the temporal. So when we think that something is warm, we are in some sense putting its being warm in a temporal order (determined by the events of which we are aware and which we are in a position to judge as prior, posterior, or simultaneous). The child who knows that mom is wet, that is, knows that mom is wet as she stands there and after she laughed.

We learn what it is for something to be warm simultaneously with learning what is for something to be warm before, during, or after an event. We learn at the beginning that property possession involves relations to events, which is but a whisker away from learning that it involves relation to times, which we presumably get to by (so to speak) abstracting from events. Given this it seems perfectly reasonable to suppose that the representation of property possession in thought will be more or less simultaneous with the representation of cognitively crucial relations like simultaneity and succession. But then there is no reason to think that the ability to think
temporally neutral thoughts must antedate the ability to think about temporal relations.

3. The upshot is that it seems most sensible to assume that predicative expressions like verbs have temporal argument positions, and that the tenses are involved in one way or another in binding variables that occupy these positions. So, doesn’t that settle the matter of temporalism vs. eternalism? Doesn’t it show that uses of sentences like ‘Mary left’, ‘Mary leaves’, and ‘Mary will leave’ are anchored to the past, present, or future of the time of their use by the temporal arguments that occur in them?

So far as I can see it doesn’t. Eternalist accounts of tense adequate to capturing the sort of data discussed in Section 1 have natural temporalist variants that are at least as adequate to that data. To show this – well, to make a case for it --I devote this section to sketching an eternalist account of sentences like (4), (5), and (6), the next section to a temporalist variant. I then return in Section 5 to the choice between temporalism and eternalism.

There are a number of accounts of tense on the market. But a fairly standard sort of account is one with the following features:

(a) Sentence syntax is of the sort found in theories in the generative tradition (e.g., one or another version of minimalism).

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7 Without pretending to be exhaustive, let me acknowledge the influence of the following on the account sketched here and in the appendix: Enc 1987, Higginbotham 2007, Ogihara 1996, Parsons 1990, Verkuyl 2008.

In what follows it is assumed that (with the exception of ‘says’) the verbs discussed are “stative” verbs (intuitively ones that pick out a state, not a process, achievement, or accomplishment). This allows us to ignore such complications as the progressive and the perfect. So far as I can see, given our focus on the issue of temporalism vs. eternalism, this is completely legitimate.
(b) Truth conditions are assigned (relative to a context of use) to something provided by the syntax (a ‘logical form’) which is derived from another level of syntax (‘surface structure’)

(c) Tenses have their own grammatical category (often called \( T \) for *tense* or \( I \) for *inflection*) and are assumed to immediately dominate verb phrases, so that to a first approximation the structure of ‘Gordon is hungry’ is\(^8\)

\[
\begin{array}{ccc}
\text{DP} & \text{IP} & \text{VP} \\
\text{I} \\
\text{Gordon} & \text{present} & \text{is hungry}
\end{array}
\]

(d) A tense involves a pair of variables and determines a temporal relation: the past determines temporal precedence (\( t < t' \)), the present temporal overlap (\( t O t' \)), the future temporal priority (\( t > t' \)). Here, \( t \) is the tense’s *event variable*, \( t' \) its *reference variable*. Assigning a time \( T \) to the reference variable makes the tense pick out a property –being

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\(^8\) Think of what is displayed below as the result of “flattening” a conventional syntactic tree by (1) making the spine of the tree parallel to the bottom of the page (instead of running down the left/right horizontal), (2) deleting the lines that connect nodes, and (3) writing the label of a node (or expression on a node) below the label of the dominating node. The advantage of this sort of display is that it is (almost) as easy to take in as a tree (unlike labeled bracketing) but takes up much less space.

I’m going to be a bit lax about syntax when less laxity might be confusing. So, for example, in the display in the text I’ve dropped intermediate projections (and thus the node labeled ‘I’ and the present tense marker are dominated by \( IP \) instead of by the intermediate projection \( I' \)). If you recognized this, you know how to fix things; if you didn’t, don’t worry about it.
past, present, or future (relative to T, of course). When a tense is not embedded within another tense, interpretation of the tense involves assigning a time –typically the time of use or an interval containing it –to the tense’s reference variable.

In this framework, the event variables of a tense are (typically) linked to the temporal arguments of the nouns, verbs and adjectives they govern. Thus the semantic structure of the sentence ‘Gordon is hungry’ is in some sense isomorphic to that of the sentence

8. \( t_{Ot'} \& \text{hungry}(\text{Gordon, } t) \)

where the first conjunct is contributed by the tense, the second the result of inserting the sentence’s subject in the appropriate argument in the verb phrase. On an eternalist account of sentence content, a use of the sentence in is interpreted by assigning the time of the context to the reference variable \( t' \), and understanding the sentence as beginning with an existential quantifier binding the event variable. Thus, using \( n \) (‘now’) as a name of the time of the use, a use of (7) says something with the truth conditions

9. For some \( t: t_{On} \& \text{hungry} (\text{Gordon, } t). \)

(That is, it says something true iff there’s a time overlapping the present in which Gordon is hungry.) A similar story has ‘Gordon was hungry’ having the truth conditions

10. For some \( t: t < n \& \text{hungry} (\text{Gordon, } t). \)
Sentences like ‘Gordon is hungry’ don’t make it clear why we need to think of tenses as relations; the payoff of this assumption comes when we consider (4) through (6). One extension of (a) through (d) to these sentences assumes that

(e) Besides the past and present\(^9\), there is a ‘null tense’ (which we write \textit{null}) that may appear (and may only appear) embedded under a ‘regular’ tense. The null tense’s interpretation is the identity relation \(t=t'\); its surface morphology is determined by the tense features of the verb immediately dominating it (so, for example, the sentence \textit{Schafer past say that Godron null be hungry} is pronounced \textit{Schafer said that Gordon was hungry}).

(f) Even when embedded, the present tense’s reference variable is interpreted by assigning it an instant or interval containing the time of use; the intentions and circumstances of the user may determine or effect which interval is assigned. Otherwise, an embedded tense’s reference variable is bound to the event variable of the commanding tense.

Assume that in interpreting a sentence complement like ‘that Gordon is hungry’ an existential quantifier (binding the reference variable of the tense that follows) is understood as occurring at the beginning of the clause. Then (4) will have two readings, since the tense of the embedded sentence can be

\(^9\) The future is probably best thought of not as a tense but as a modal. See, for example, Enc 1996.
either the past or the null tense. (If it were the present, we would have sentence (6).) The first reading is

4.3  DP  Tense  Verb  DP  Tense  VP
     Schaffer  Past  say  that  Gordon  Past  be hungry

The semantic structure of the sentence is (ignoring understood quantifiers)

4.31  t<t’ & Say(Schaffer, t’, that t”<t’’’ & Hungry(Gordon, t’’’).

This is interpreted relative to the context of use by assigning the time of the context to the reference variable t’, co-indexing the embedded reference variable t’’’ with the event variable t of the governing tense, and understanding each clausal boundary to carry an existential quantifier that binds the clause’s event variable. The upshot is that the sentence receives its shifted interpretation

4.32  For some t: t<n & Say(Schaffer, t, that for some t” :t”<t & Hungry(Gordon, t”).

So the sentence says that for some t before the present, Schafer says at t that for some t” before t Gordon is hungry at t”.

The other reading of the sentence replaces the past with the null tense, which is interpreted as the identity relation. The same procedure of assigning times, co-indexing, and reading existential quantification at clausal boundaries yields the simultaneous reading of (4):
4.4 For some t: t<n & Say(Schafer, t, that for some t” :t”=t & Hungry(Gordon, t”).

In the case of

5. Schafer will say that Gordon is hungry,

there are again two readings, depending on whether the tense of the embedded sentence is present or null.\(^\text{10}\) The assumptions above thus predict the readings

5.21 For some t: t>n & Say(Schafer, t, that for some t” :t”=n & Hungry(Gordon, t”).

5.22 For some t: t>n & Say(Schafer, t, that for some t” :t”=t & Hungry(Gordon, t”).

\(^{10}\) I am assuming that modal ‘will’, while not itself a tense, carries a feature associated with tense—it has the feature ‘+ present’. (The verb ‘say’ in (5) is an infinitive and thus not tensed, as becomes clear if one reflects on examples like ‘Schafer will be sad’ or ‘he will have a cold’.) This explains why (5), given (e) above, has a reading on which ‘is’ carries the null tense. (This may sound somewhat \emph{ad hoc}, but the idea that there are (something like) just two tense features, \emph{present} and \emph{past}, and that the future is associated with \emph{present} is fairly standard.)

Given that the null tense has to be embedded by a genuine tense, the assumptions we’re making imply that a sentence like

Schafer will say that Gordon will be hungry

is \emph{not} ambiguous in the way that (4) and (5) are: the embedded verb here can’t carry the null tense, since the null tense can only be embedded under a tense (past or present) and the embedding expression doesn’t carry a tense. This is the right prediction to make about the sentence.
Finally, consider

6. Schafer said that Gordon is hungry.

A quite natural and normal use of (6) is as an answer to the question ‘Who’s hungry?, the user reporting Schafer’s utterance ‘Gordon is hungry’ which was made a few minutes back. Such a use seems to have Schafer speaking about both the time $t_u$ at which he uttered ‘Gordon is hungry’ and the time $t_r$ at which his speech is reported. (For this reason sentences like (6) are said to have a “double access” reading.)

On the account sketched above, the present tense, even when embedded, is tied to the time of use: its use at an instant $t$ is interpreted by assigning the tense’s reference variable an interval containing $t$; the interval to be assigned may be constrained by the intentions and circumstances of the user. This means that Schafer’s utterance will have the interpretation

11. For some $t$: $t \text{On}_s \& \text{Hungry}(Gordon, t)$,

where $n_s$ is an interval containing the time of Schaffer’s utterance; the report will have the interpretation

6.1 For some $t$: $t < n \& \text{Say}(\text{Schafer, } t, \text{ that for some } t’: t’ \text{On}_r \& \text{Hungry}(\text{Gordon, } t’))$,

where $n$ is the instant (or an interval containing) the time (6) is uttered, and $n_r$ is an interval containing that time. Given the common assumption that the correctness of a report of a saying requires an identity of content between the
interpretation of the identity’s complement and the original utterance, the report will be correct if but only if \( n_s = n_r \).

One might wonder how it could come to be that \( n_s = n_r \): how would the user of (6) know what interval Schafer had in mind? But it’s easy to see how this might be if we assume that the present tense acts like a constrained demonstratives such as ‘we’. A use of ‘we’ picks out a group that includes the speaker and others; exactly which group is picked out turns on the speaker’s intentions and circumstances. Likewise, the reference variable of the present tense picks a temporal entity that includes the time of speech and other times; which other times turns on the speaker’s intentions and circumstances.

It is not implausible to think that speakers typically expect their ascriptions of hunger to be valid for some time into the future (how far depending upon the particular case); neither is it implausible to suppose that speakers expect others to so understand them. If speakers have such expectations and use the present as a constrained demonstrative, we are then licensed to interpret their uses of the present (within the margins of vagueness) as being interpreted by an interval that extends some time past the time of their speaking. In the case at hand (fleshed out a bit, at least), it will be plausible to interpret Schafer as speaking of an interval that includes the time of the report of what he said. If (6) is used shortly after Schafer’s utterance, the relevant interval will include the time of (6)’s use. If so, and (plausibly) the reporter simply intends to speak of whatever interval it is of which Schaffer spoke, then \( n_s \) is indeed \( n_r \), and the use of (6) is true.

4. On the story just rehearsed, a tensed sentence begins with a tense that contains two variables. The event variable is bound by an existential
quantifier (and co-indexed with temporal arguments further down in the sentence); the reference variable is assigned (an interval containing) the time of use of the sentence.

Take a tensed sentence relative to a particular context of use. Interpret it, save for its reference variable, relative to the context. What you have determines a function from times to eternal propositions. If the sentence you began with, for example, was ‘my baby doesn’t love anyone but me’ and the context is one with me as its agent, what you get is a sentence which maps t to the claim that at t, Mark Richard’s baby loves no one but Mark Richard. Such functions correspond to the sort of thing the temporalist says is, at least on occasion, the object of assertion and belief. And so it occurs to one that the temporalist might appropriate the sort of syntax and semantics just sketched to his own devices.

Here is perhaps the simplest way to do this.\footnote{Ogihara 1996 combines something like the account of the tenses sketched in the last section with the idea that lambda abstraction is to be used to insure that (absent explicit temporal reference) the claims assigned to sentences are temporalist. (Ogihara, following Lewis 1979, takes the objects of the attitudes to be properties, which correspond to sets of worlds centered on agents at a time.)}  We posit two variable binding operators, the unary $\exists_{\text{event}}$ and the binary $\lambda_{\text{reference}}\exists_{\text{event}}$ (henceforth subscripts are suppressed). We assume that in the course of interpreting a tensed sentence one of these operators is adjoined to the beginning of each (non-relative) clause.\footnote{In what follows I ignore issues introduced by relative clauses (e.g., ‘who was crying’ in ‘an old man helped a boy who was crying’). The procedure gestured at in the text should not adjoin variable binders to relative clauses.} The operator $\exists$ is a conventional first order quantifier ranging over temporal intervals; it binds the event variable in the tense immediately below it. $\lambda\exists$ is an existential quantifier following a
functional abstraction operator\(^{13}\); adjoined to a tensed clause the quantifier binds the event variable in its initial tense, and the lambda operator binds its reference variable. If just the quantifier is adjoined to a clause (so that the initial tense’s reference variable is left unbound), then in the course of interpretation, the clause’s reference variable is assigned an interval containing the time of the interpreting context (or, in the case of an embedded clause, is co-indexed with the event variable of the commanding clause).

On this account, the sentence ‘Gordon is hungry’ has two possible interpretations in a context, the eternalist

\[8. \exists t: \text{On} \land \text{Hungry (Gordon, t)}\]

(n an interval containing the time of the context) and the temporalist

\[8.1 \lambda t'. \exists t: \text{Ot'} \land \text{Hungry (Gordon, t)},\]

(the latter pronounced: the function that maps \(t'\) to truth just in case for some \(t\) that overlaps \(t'\), Gordon is hungry at \(t\)).\(^{14}\) ‘Gordon was hungry’ will have the interpretations

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\(^{13}\) Thus, the meaning of \(\lambda v. A\) is the function that maps \(x\) to the semantic value of \(A\) when \(x\) is assigned to \(v\).

\(^{14}\) We need not identify temporalist propositions with such functions; we can instead think of them as structured entities which have functions denoted by functional abstracts as constituents.

The account being sketched makes the objects of the attitudes a variegated collection, with some (corresponding to) functions from worlds to truth values, others functions from worlds and times to truth values. Someone might object to this. It seems to me that there’s nothing objectionable \textit{per se} here. If our practices of interpreting one another are best understood as involving ascription of a variety of objects of the attitudes
9. \( \exists t: t<n \& \text{Hungry (Gordon, } t) \)

9.1 \( \lambda t' \exists t: t<t' \& \text{Hungry (Gordon, } t) \).

Things get interesting when we consider a sentence like

4. Shafer said that Gordon was hungry,

which now has eight (!) interpretations, depending on (a) whether the embedded tense is the past or the null tense, and (b) on which operators head each clause in the sentence. If the embedded tense is past, the four possibilities are

4.51 \( \exists t(t<n \& \text{Say(Schafer, } t, \text{ that } \exists t''( t''<t \& \text{Hungry(Gordon, } t''))) \)

4.52 \( \exists t(t<n \& \text{Say(Schafer, } t, \text{ that } \lambda t' \exists t''( t''<t' \& \text{Hungry(Gordon, } t''))) \)

4.53 \( \lambda t' \exists t(t<t' \& \text{Say(Schafer, } t, \text{ that } \exists t''( t''<t' \& \text{Hungry(Gordon, } t''))) \)

4.54 \( \lambda t' \exists t(t<t' \& \text{Say(Schafer, } t, \text{ that } \lambda t'' \exists t''( t''<t''' \& \text{Hungry(Gordon, } t''))) \)

These may be glossed at follows:

4.51 Shafer asserted at some \( t \) before now the eternalist claim that Gordon was hungry before \( t \).

\[ \text{–and someone might say that the evidence at the beginning of the next section suggests that this is so –then we are best off thinking of the objects of the attitudes as so variegated.} \]
4.52 Schafer asserted at some time before now the temporalist claim Gordon was hungry.

4.53 It was the case at some past t that Schafer asserted the eternalist claim that Gordon was hungry before t. (This is a temporally unspecific claim that in the past Schafer asserted something temporally specific.)

4.54 It was the case at some past t that Schafer asserted the temporalist claim that Gordon was hungry.

The idea that (4) has all of these readings is no more and no less plausible than the idea that ‘Gordon is hungry’ or ‘Gordon was hungry’ has both a temporalist and an eternalist reading. After all, if the latter can be understood as making either temporally specific or temporally neuter claims, the same should be true of the form Schafer said that S: this ought be capable of making both a claim specific as to when Schaffer spoke, and one neutral about this. And if ‘Gordon was hungry’ can say something either specific or neutral about time, surely we can ascribe the saying of something specific, and the saying of something neutral, with the shifted reading of ‘Schafer said that Gordon was hungry. And this gives us the four readings of the past over past understanding of (4).\(^{15}\)

There is, I think, equal plausibility in the idea that (4) also has the four interpretations which result from replacing the embedded past tense tense in (4.51) through (4.54) with the null tense:

\(^{15}\) Of course if we had a robust intuition that one of these readings couldn’t be expressed by (4), that would be very bad for the present proposal. But other than philosophers’ “intuitions” that temporalist readings are impossible, we do not, as far as I can see, have any such intuitions.
4.55  \( \exists t (t < n & \text{Say}(\text{Schafer}, t, \text{that } \exists t'' ( t''=t & \text{Hungry}(\text{Gordon}, t'')))) \)

4.56  \( \exists t (t < n & \text{Say}(\text{Schafer}, t, \text{that } \lambda t' \exists t'' ( t''=t' & \text{Hungry}(\text{Gordon}, t'')))) \)

4.57  \( \lambda t' \exists t (t < t' & \text{Say}(\text{Schafer}, t, \text{that } \exists t'' ( t''=t & \text{Hungry}(\text{Gordon}, t'')))) \)

4.58  \( \lambda t' \exists t (t < t' & \text{Say}(\text{Schafer}, t, \text{that } \lambda t''' \exists t'' ( t''=t''' & \text{Hungry}(\text{Gordon}, t''))) \).

So far as I can see, there aren’t cases in which multiplying readings of tensed sentences in the way in which we do when we claim that (4.51) through (4.58) are readings of (4) leads us to say anything that is any more implausible than what one says, when one says that ‘Gordon is hungry’ has two readings, one temporally specific, one temporally netural.

I thus doubt that simply deciding that tense involves variable binding and not operators will decide between temporalism and eternalism.

5. Unfortunately the argument in Essay 1 doesn’t by itself decide the matter, either.

The argument there turns on cases –like the conclusion of the argument Mary thought that Nixon was president, and still believes whatever she once did; so she thinks that Nixon is president –where interpreting an attitude ascription as ascribing temporalist content seems ludicrous.

But there are cases where interpreting an ascription as one of eternalist content seems equally ludicrous. Some examples. (a) Susan saw Kate two winters ago and said ‘Damn, she’s pregnant.’ Mindy saw Kate this spring and said ‘She’s pregnant’. I say
12. When Susan saw Kate two winters ago she swore that Kate was pregnant, and when Mindy saw her this spring, that’s what she said, too.

This seems right. But it seems to report Susan and Kate as saying the same thing; if what each said was temporally specific, it has them (absurdly) both speaking about a single time. Substantially the same point is made by the example

13. Bob went to the monkey house, and now he thinks that he’s been infected with the Ebola virus. Every time he goes there he thinks that; he’s convinced one of the monkeys is a carrier.

(b) A somewhat different sort of example: It is a fact that

13. It was safe to hitchhike in the sixties, but that’s no longer true/the case.

The fact, of course, is that it’s no longer true that it is safe to hitchhike, not that it is no longer true that it was safe to hitchhike in the sixties.

The temporalist will insist that there is a reading of sentences like Mary believed that Nixon was president and Susan swore that Kate was pregnant on which they ascribe a relation to a temporal content.\(^\text{16}\)

According to the temporalist, the first sentence is ambiguous between

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\(^{16}\) Confine attention to the case in which the embedded clause takes the null the tense – i.e., the simultaneous reading.
P.  \( \exists t(t<n \& \text{Think}(\text{Mary}, t, \text{that } \exists t''( t''=t \& \text{President}(\text{Nixon}, t''))) ) \)

P'.  \( \exists t(t<n \& \text{Think}(\text{Mary}, t, \text{that } \lambda t' \exists t'' ( t''=t' \& \text{President}(\text{Nixon}, t''))) ) \)

the second between

R.  \( \exists t(t<n \& \text{Swear}(\text{Susan}, t, \text{that } \exists t''( t''=t \& \text{Pregnant}(\text{Kate}, t''))) ) \)

R’.  \( \exists t(t<n \& \text{Swear}(\text{Susan}, t, \text{that } \lambda t' \exists t'' ( t''=t' \& \text{Pregnant}(\text{Kate}, t''))) ) \)

Perhaps it is ludicrous to interpret Mary believed that Nixon was president as (P’) in the Mary/Nixon argument; it is equally ludicrous to interpret Susan swore that Kate was pregnant as (R) in the case of (12). But this is a result of non-linguistic knowledge rendering one of the readings ludicrous; both readings need to be present in order to account for the facts about the truth conditions of the relevant sentences.

The balance of this section argues that sentences like (12) through (14) give absolutely no evidence for temporalism.

One is initially inclined to interpret that in that’s what she said and every time he goes there he thinks that as an anaphoric pronoun that refers to the object said to be asserted or believed earlier in the sentence. But consider the italicized ‘that’’s in the ascriptions

15.  I’m surprised that Arthur admitted that he beat his dog; only a fool would say that

16.  Sue thinks that a man from New York City will win the race. But Beth doubts that –she heard he pulled a hamstring.
17. The Bouchers believed that their children had smoked; most parents doubt that.

18. When he saw him chatting up his fiancé, John told Sam that he would kill him; and that’s what Fred told Max when he saw him chatting up his fiancé.

In the natural understandings of these sentences the ‘that’ ‘s don’t seem to be simple anaphoric pronouns, referring to the proposition expressed by a complement clause of the sentence preceding them. The first half of (15), for example, expresses surprise at Arthur’s denial of the claim that Arthur beat his dog. But the natural understanding of (15) is not

15’. I’m surprised that Arthur admitted that he beat his dog; only a fool would say that Arthur beat his dog,

which it would be if the terminal ‘that’ was simply a device for referring to the proposition Arthur admitted. In the case of (16), there isn’t a proposition expressed by the preceding complement clause: the only (sensible) way to construe (16) takes ‘a man from New York’ to have wide scope over the first clause, which means that the complement has a (trace or something else that functions as a) free variable free in place of the phrase ‘a man from New York City’. In (17), not only is the subject of the elided complement different from that of its antecedent; the tense of the elided clause is in some sense different from that of the first complement. (17), after all, is understood as
17’. The Bouchers believed that their children **had smoked**; most parents doubt that their children **have smoked**.

Finally, consider the reading of (18) on which John says that John will kill Sam and Fred says that Fred will kill Max. What’s interesting about this sentence is that the “missing material” in the second sentence must involve *two* “back references”, one to Fred and one to Max.

There seem to be two strategies for interpreting (15) through (18) -- and thus two strategies for interpreting (12) and (13).\(^{17}\) We can understand them as cases of ellipsis, as are sentences like

19. Arthur beat his dog, and the fool in the corner did too.

20. The Bouchers smoked, and their children do too.

21. Arthur gave a book to every girl he dated, and so did Sam.

Alternatively, we can understand the ‘that’ ‘s in the examples as naming something like (the property or relation named by) a property abstract formed from the material in the antecedent sentence, the property (or relation) being combined with material contributed by the surrounding sentence to produce an argument for attitude verb. As we will see, on neither account is there any reason to think that (12) and (13) involve ascription of temporally neutral content.

\(^{17}\) (14) --which as we will see is anomalous on everyone’s view --is discussed below.
There is less than consensus about ellipsis in the literature.\(^\text{18}\) All agree that the elided material in a sentence S is in some sense identical to material in the antecedent of the ellipsis. But there are at least two mechanisms that can account for such identity. S might be generated with a placeholder for the elided material, which is filled in after the pronunciation of the sentence is determined, perhaps by copying. Or S might be generated with the elided material in place, that material being deleted when the phonetic properties of the sentence are determined.\(^\text{19}\) As we’ll see below, the copying account seems problematic because there are examples in which simply copying the elided material doesn’t give the right sort of information to determine the (possible) meaning(s) of a sentence. I will thus assume that a deletion account of ellipsis is correct: ellipsis is a matter of phonological suppression of material when it is “identical” to material in a preceding clause.

Even if we accept that ellipsis is a matter primarily of phonology -- the elided material is “really there, but unpronounced” -- there’s a great deal of detail of be worked out.\(^\text{20}\) But one can see immediately that if it were the case that (a) a phonological account of ellipsis is on the right track, and (b) (12) and (13) involve phonological ellipsis, there is simply no reason to think that these sentences provide evidence for a temporalist account of


\(^\text{19}\) The former story has at least two versions: on one, “surface structure” is copied onto the place holder (Kitagawa 1991), on the other (Williams 1977) “logical form” is copied. In the deletion story, the phonologically deleted material is “still there” (but is not pronounced) and plays the same role in determining meaning that it would have played had it not been deleted; this story requires that whatever determines pronunciation can “see” facts about logical form.

\(^\text{20}\) Fox 2000 is an interesting attempt to work out some of the details.
content. Take (13), for example. If it involves ellipsis, then the possibilities for its interpretation are the same as are the possibilities for

13’. Bob went to the monkey house, and now he thinks that he’s been infected with the Ebola virus. Every time he goes there he thinks that he’s been infected with the Ebola virus; he’s convinced one of the monkeys is a carrier.

But there is no reason whatsoever to suppose that the interpretive possibilities for (13’) provide aid or comfort for the temporalist. The same applies to

12. When Susan saw Kate two winters ago she swore that Kate was pregnant, and when Mindy saw her this spring, that’s what she said, too,

given the reasonable assumptions that ‘that’s what she said’ in (12) is to be treated as would ‘what she said was that’ would be treated, were it to be the tag in (12).

However, it’s not clear an ellipsis account of these sentences is correct. At least this is suggested by an objection in Segal and Speas 1986 to Davidson’s account of indirect discourse. Davidson famously hypothesized that the ‘that’ of ‘Galileo said that the earth moved’ was a demonstrative that picked out the sentence that follows it. Segal and Speas note that the complementizer ‘that’ can be pronounced in a reduced form –its vowel becomes unemphasized and the word sounds sort of like ‘dit’. But this is decidedly not true of the demonstrative ‘that’, which is never reduced –its
'a’ is always pronounced as the ‘a’ of ‘fat’. This suggests that Davidson’s hypothesis was wrong. It suggests as well that the terminal ‘that’s of (15) through (17) are not the same sort of thing as the ‘that’s in the antecedent clauses. For (15) through (17)’s terminal ‘that’s can’t be reduced. But one thinks that if these sentences involved ellipsis, the relevant ‘that’s would be complementizers, not demonstratives. While this argument isn’t conclusive, it makes one want to avoid the hypothesis that the sentences are simply elliptical.  

If we forego an ellipsis account of these examples, we probably must understand their ‘that’s as providing –presumably by referring to –something determined by the antecedent –or as I will henceforth call it, the source –sentence. The complement clauses of the source sentences will correspond straightforwardly to property or relation abstracts. For example, simplifying (and for the moment completely ignoring tense) the syntactic structures of the complements of the source sentences of (15) and (18) are

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21 Thanks to Graeme Forbes for this objection and to Gabe Segal for correspondence.
22 An alternative that might be worth considering is one on which ‘it’ and ‘that’ in sentences like

\[
\begin{align*}
\text{A said that X. B doubts it.} \\
\text{A said that X. C believes that.}
\end{align*}
\]

are assimilated to cases of ‘unbound anaphora’ (like so-called ‘donkey anaphora’) and unbound anaphora is given an understanding on which the anaphoric pronoun is a proxy for a complex expression (typically a description) constructed from that on which the anaphor is anaphoric. Such an account, I think, would end up making predictions much like an account of these pronouns in terms of ellipsis.

23 Here I treat the anaphoric pronouns within the complements as free variables; the points to be made would be the same on other treatements
These straightforwardly determine predicate abstracts. Indeed, on fairly standard syntactic stories, when the missing detail is supplied here, there will be predicate abstracts in the source sentence in which the $x_i$’s are bound. It would thus appear that in the cases we are considering the ‘that’s in the second sentence in each of (15) through (18) --what I will henceforth call the target sentence--may be understood as referring to the semantic values of the relevant predicate abstracts.

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If we assume, for example, that (i) ‘he’ in (15) originates in the verb phrase and moves to the top of the complement clause ‘that he beat his dog’, and (ii) if a phrase like ‘he’ moves from position X to position Y, then the phase leaves a variable-like element (a trace) at X, is adjoined to position Y, and the material from position Y down is turned into a property abstract, we have this result. (i) and (ii) correspond to the idea that, for example, after ‘Arthur’ moves to the top of the structure

\[
\begin{align*}
\text{IP} & \quad I’ & \quad \text{VP} & \quad V’ \\
I & \quad \text{Present} & \quad \text{Arthur} & \quad \text{cry}
\end{align*}
\]

the sentence looks something like

\[
\begin{align*}
\text{IP} & \quad I’ & \quad I’ & \quad \text{VP} & \quad V’ \\
\text{I} & \quad \text{Present} & \quad \lambda x_1 & \quad x_1 & \quad \text{cries,}
\end{align*}
\]

so that the result means something like *Arthur is an x such that x cries*. The assumption that something like (ii) occurs whenever there is movement is perfectly standard in semantics; for a clear exposition and discussion of the plausibility of this picture see Heim and Kratzer 1998, particularly sections 7.1 through 7.4.
This does not quite explain how the sentences receive their interpretations, however. The problem is clearest when we consider (18). If we suppose that its terminal ‘that’ names the property abstract corresponding to (18.1), we have (18)’s target sentence saying something like this:

18.2 When Fred saw Max chatting up Fred’s fiancé, Fred told Max \( \lambda x \lambda y (\text{that } x \text{ would kill } y) \).

It’s not unheard of, of course, to suppose that the objects of attitudes are properties, not propositions. But what the abstract here names is a relation, and is hardly a fit object for a belief or assertion.\(^{25}\) For what belief or assertion would it be the object of? That Max will kill Fred? That Fred will kill Max? That something will call something? There is no saying, and there is no belief whose content the relation exhausts.

What is needed here is a mechanism that insures that the relation named in (18.2) gets combined with arguments in the right order and that the sentence ascribes assertion of the resulting combination. Put otherwise: what is needed here is something that will assure that the binding relations between ‘John’, ‘Sam’, and ‘he would kill him’ that obtain in (18)’s source sentence are mirrored by relations between ‘Max’, ‘Fred’ and what ‘that’ refers to in (18)’s target sentence. This is why the idea that sentences like (18) involve ellipsis is attractive to being with. On an ellipsis account of (18), the occurrence of ‘that’s what Fred told Max when he saw him chatting up his fiancé’ in the sentence actually contains an ellided expression which

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\(^{25}\) We might want to say that the abstract in (18.2) names a function from pairs of individuals to propositions. But that is just to say that the abstract names a particular sort of three place relation.
has the interpretation of the property abstract in (18.2); and, because this abstract will have been formed by movement of ‘he’ and ‘him’ out of their positions in the complement clause, the abstract will be related to the rest of the sentence in such a way that the sentence ascribes to Fred the assertion of the claim that he would kill Max if there was more chatting up.

I do not propose to investigate here how might spell out the details of an account of (18) and its fellow travelers which assigns them the right truth conditions and treats the relevant occurrences of ‘that’ as naming relations. What needs to be stressed, however, is that anyone who rejects an ellipsis account of these sentences in favor of one on which the ‘that’ ‘s name properties or relations must provide an account along these lines. Any such account will, in order to get the truth conditions of sentences like (18) correct, have to provide a mechanism in which the binding relations in a source sentence are somehow mirrored in the target sentence for the source.

Once we recognize this, we can see that (12) and (13) provide no evidence whatsoever for a temporalist account of content. For if we take the terminal ‘that’s in these sentences to name the relations associated with the relational abstracts in the source sentence, we will assume that the relation named has a place corresponding to each free variable (or trace, in linguist jargon) in the complement clause of the source sentence. And the binding relations between abstract and antecedents in the source sentence will be mirrored by the relations between the relation named by ‘that’ in the target sentence and antecedent expressions in the target sentence. Thus, if ‘Mary swore that Kate was pregnant’ ascribes a relation to a temporally specific

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26 Putting it more intuitively: whatever variables/traces would be present in the complement on an ellipsis account will still be there on the alternative account; but for each such variable/trace that is not bound by something within the clause, there will be an argument in the relation.
content in (12)–because the tense in the lower clause is bound to that in the higher clause, and the higher tense’s reference variable refers to the time of use)–then the target sentence’s interpretation will mirror this, and ascribe assertion of a temporally specific content to Mindy. These examples simply don’t provide evidence that bears on the choice between temporalism and eternalism.

27 Here is the place for a brief discussion of the idea that ellipsis involves deletion of material, not copying. There are a number of arguments for this view; relevant here is the following (which is suggested by a remark in Fox 2000; Fox shouldn’t be held responsible for the argument that follows).

Consider

E. A teacher consoled each student, and a grief counselor did, too.

Suppose that this sentence is generated with a place holder for a verb phrase after the ‘did’, the placeholder being filled later on by copying the verb phrase in the antecedent sentence onto the place holder. There is an understanding of (E) on which ‘each student’ takes wide scope in both clauses, and a reading in which the subject of each clause takes wide scope within it; there aren’t mixed readings. Now, if copying occurs before operations like quantifier movement, there is nothing to prevent different quantifier scopes in the two clauses (save an ad hoc stipulation that in this sort of case movement in one clause constrains movement elsewhere). But if copying occurs after quantifier movement, the sentence’s meaning can’t be determined simply by copying material into place holder for the missing verb phrase: one would have to “copy” the material in the antecedent VP, the moved quantifiers, and insure that binding relations are preserved in the copying. This problem doesn’t arise we assume that (E) is generated with the elided material in place and that (after quantifier movement and such have occurred), material can be elided (i.e., unpronounced) when it is identical in configuration to antecedent material.

Though the problem here is not exactly the problem we faced when we considered rejecting the idea that (15) through (18) involve ellipsis, it is strikingly similar–similar enough that I think we need to take seriously the idea that the syntax of ellipsis of sentences like (15) through (18) is similar.

Having said all this, I should point to a bit of evidence that points in the other direction. There are cases where ellipsis and use of ‘that’ may come apart, interpetively. Consider, for example, the sentences

A math major dated every English major. An engineering major did too
A math major dated every English major. An engineering major did that too
This leaves

14. It was safe to hitchhike in the sixties, but that’s no longer true/the case.

It’s sentences like this, I think, that constitute the strongest *prima facie* case for something like a temporalist operator account of the tenses. If we treat the past tense as an operator, we will see the logical form of (14)’s first clause as

\[ P(H), \]

where \( H \) regiments a temporally neuter ‘to hitchhike is safe’. Assertively uttering a sentence with a constituent that expresses (as so uttered) the proposition \( p \) makes \( p \) available for demonstrative reference. So we can regiment (14)’s second clause so

\[ \text{Not True}(\text{that}) \]

with the *that* referring to the netuer claim; this delievers the intuitively correct truth conditions for (14).

Does this show that, the evidence in section 1 notwithstanding, an operator account of the tenses is to be preferred to a variable binding account? I don’t think so. Note, to begin with, that an operator account

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The first sentence has an interpretation in which ‘every English major’ takes wide scope in each sentence; it’s not clear that the second does.
makes manifestly false predictions about the sort of case we are considering. If (14) is to be regimented as

22. \( P(H) \& \text{not True (that)}, \)

surely such a reading should be available for the slightly simpler

14’. It was safe to hitchhike in the sixties, but that’s not true/the case.

But so far as I can see such a reading is impossible –the only way of understanding (14’) is to take it as self-contradictory. Not unrelatedly, the operator account predicts that

23. Bob was happy, but Sam doesn’t believe that

should have a reading on which it says what’s said by

23’. Bob was happy, but Sam doesn’t believe that Bob is happy;

but of course it doesn’t. The lack of readings predicted by (natural) versions of an operator account is in fact quite robust. Consider

24.1 # [After the meeting] I ate, but that’s no longer true.
24.2 # I ate, but that’s not true now.
24.3 # I had eaten, but not now.
24.4 # [After the meeting] I will eat, but that’s not true.
(‘#’ indicates a judgment that grammaticality requires a bizarre presupposition.) However we explain the facts about (13), I think we do best to avoid treating tenses as operators.

The data here seem to speak against the temporalist account of tense sketched in section 3 above, too. Take (14), for example. Suppose that we try to explain the natural reading of this sentence (on which it is true in early 2009 iff it was safe to hitchhike in the sixties but to hitchhike in early 2009 is not safe) by using a lambda abstract to regiment its first clause, taking the ‘that’ in its second clause to refer to the semantic value thereof. Then we predict the non-existent readings of (14’) and (23). Much the same point can be made with the (24)’s.

The upshot is that sentences like (14) do not give a reason to think that a temporalist account of content is correct, since temporalist accounts that assign them their intuitively correct truth conditions make inaccurate predications about other sentences. Likewise, there is no reason to think that the best accounts of the syntax and semantics of sentences (12) and (13) will be ones that are incompatible with either the spirit or the letter of an eternalist account of content. There is, so far as I can see, no data about tensed attitude ascriptions whatsoever that suggest that some content –i.e., some objects of attitudes like assertion and belief– is merely temporal. But there is reason in this data to think that all content is eternal –this is the data reviewed in Essay 1. This data, then, suggests eternalism, not temporalism, is correct.

28 It would, of course, be most satisfying to wed this observation to an explanation of our intuitions about (14) that was consistent with eternalism. Frankly, I haven’t been able to find an account of any sort of this sort of sentence that I find plausible. This certainly doesn’t speak against an eternalist account of the data; the point of this section is that (12) through (14) don’t provide evidence against eternalism.


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