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DESIRE CONTENTS AND TEMPORAL ADVERBS¹

SUMMARY: In this paper, I endorse and discuss “desire temporalism”—the view that desire contents are temporal. Though it makes a claim limited to desire contents, it is considerably stronger than *standard* temporalism (at least, when it comes to desires), which is simply the view that *there are* temporal contents. Having introduced desire temporalism, I focus on a potential objection to it. The objection proceeds from the plausible observation that desire ascriptions with certain kinds of temporal adverbials can serve as counterexamples to desire temporalism. This is so if temporal adverbials denote times

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¹ This paper was a long time in development. Spurred on by some comments I received in a helpful referee report on (Skibra, 2021; thanks to this anonymous referee), I prepared an abstract to present some initial thoughts about this topic for the 3rd Context, Content, and Communication conference in Warsaw. The pandemic intervened, the conference was postponed, and I thought about this not one bit in the meantime. When CCC3 was rescheduled in person, it renewed the opportunity to revisit the topic. I am grateful for the opportunity, and thank Lukas Lewerentz, Alex Kocurek, Victor Verdejo, Olga Poller, and Susanna Melkonian-Altshuler for discussion in Warsaw. A suggestion that I submit to the present special issue provided the impetus to write up the results, and my thinking evolved again over the course of writing. Subsequent discussions of the draft with Thomas Müller, Verena Wagner, and Daniela Schuster (in Thomas Müller’s colloquium), with David Rey, Rafael Gutiérrez, and an audience at the Philosophy and Generative Grammar 2 Workshop, and with Todor Koev, Michael Glanzberg, and Hadil Karawani helped things along. Thanks finally to Tadeusz Ciecierski, Paweł Grabarczyk, Maciej Sendłak, and Dominik Dziejdzic for their efforts in putting this issue together (and their patience with me), and to two helpful referees for comments on the submission, which instigated some good changes. Work on this project was completed at the Zukunftscolleg at the University of Konstanz, and funded as part of the Excellence Strategy of the German Federal and State Governments.

which correspond to the time indications in the ascribed attitude content. I respond to this objection by arguing that these temporal adverbials do not play such a role—instead of corresponding to time indications in the desire content, we can see them as contributing to the circumstance of evaluation relative to which the content is assessed. This would allow desire temporalism to evade the objection. Looking for a way to implement this idea, I consider Brogaard's (2012) composite tense operators as a promising avenue to explore, but opt instead for an approach to tense more popular in formal semantics, according to which tenses are temporal pronouns. In the final section of the paper, I show how this pronominal theory of tense can be pressed into service of just such a claim as advanced earlier, so we have a way of evading the challenge posed by these time-denoting temporal adverbials.

KEYWORDS: attitudes, content, tense, temporalism, eternalism, operators, temporal pronouns, desire ascriptions.

1. Introduction

This paper is about attitude content, and about our talk about our attitudes. More specifically, it is about desire content, and its relation to talk about the attitudes. As far as desire content goes, I describe and endorse a view I call desire temporalism—the thesis that desire contents are temporal. Although the moniker I use here is novel, the view itself is not; it has precursors throughout the literature. In describing the view, I will not offer a full-throated defense of it so much as showcase some reasons to hold it.

The central aim of the paper is to defend desire temporalism from a particular kind of objection. The objection is fairly simple, and interfaces with our talk about attitudes. It is this: there are perfectly appropriate, acceptable, and seemingly true desire ascriptions that contain what appear to be time-denoting temporal adverbials. A reasonable assumption is that the truth conditions of such attitude ascriptions describe a content with a time indication—namely that time denoted by the adverbial. How could this be, if desire contents are temporally neutral? Does this not refute desire temporalism?

I answer this last question in the negative, by rejecting the assumption on which the question is based. These temporal adverbials can indeed denote times, without the denoted times describing time indications that are part of the subject's attitude content. What do they do, then? I argue that they modify circumstances of evaluation relative to which the content is evaluated, and in the paper canvas some suggestions congenial with this proposal. There are complications, though, having to do with the interpretation of tenses and temporal adverbials in natural language. In particular, it is been argued that tenses in natural language are best modeled as pronouns introducing time variables into the Logical Form of the clause. At first blush, this promises to allow an easy account of temporal adverbials. Moreover, it is also been argued that this pronominal view of tense

leaves little room for temporalism. If this is right, then it becomes difficult to see how the proposal about circumstances of evaluation can be squared with the pronominal theory of tense.

In light of this complication, I then show how the pronominal theory of tense actually does not rule out this proposal. Instead, when properly understood, the pronominal theory of tense provides resources to accommodate it. The local aim of the paper, therefore, is to show how desire temporalism is defended from this objection within the framework of the pronominal theory of tense. There is a broader aim of the paper as well, which is to show that forms of temporalism about attitude content are quite consistent with dominant theories of tense in formal semantics, contra what is often argued. Language, it would seem, provides resources to describe and communicate about this kind of content, even if semantic content—the output of compositional semantics for natural language sentences in context—turns out to be eternal.

The paper is organized as follows. Sections 2 and 3 introduce desire temporalism, rehearse some reasons to accept the thesis, and compare it to standard versions of temporalism in the literature. Section 4 introduces the challenge posed by temporal adverbials, and Section 5 introduces the idea to have temporal adverbials modify circumstances of evaluation. I attempt to flesh out the proposal through a discussion of Borgaard's (2012; 2022) notion of composite tense operators in Section 6, but raise some skeptical worries about these in Section 7. Section 8 provides an interim summary and is followed by an explanation of the pronominal theory of tense in Sections 9 and 10, focusing on some agenda-defining issues for the framework. Section 11 introduces the theory of the temporal *de re* (Abusch, 1997), one of the main accounts of how the pronominal theory of tense deals with the aforementioned issues. It is with the temporal *de re* that I find the machinery congenial to my claim about adverbials modifying circumstances of evaluation. Section 12 addresses some loose ends concerning the application of the temporal *de re* to the desire ascriptions we were concerned with. Section 13 recaps and concludes.

2. Desire Content is Temporal

In this section, I will summarize some arguments that the contents of desires are temporal. Let us start by clarifying this claim and some relevant terminology. By saying they are temporal, I mean that desire contents do not specify a time indication as part of their content, and the evaluation of desire contents requires the provision of a time relative to which it can be evaluated. There are other ways of characterizing temporal contents; I prefer this way for reasons I will make clear over the course of this section. This makes desire content look a lot like what temporalists call a temporal proposition, so for convenience sake I will sometimes refer to the temporal contents of desires as temporal propositions.

However, there are important differences between desire temporalism and the kind of claim typically associated with temporalists.²

By “content”, I mean a form of mental content; the states that a subject’s intentional states are about or directed towards. I will assume that these contents are representational and that something like propositions do a good (or good enough) job representing them.³ Presumably other things can have content, too, like illocutionary acts like assertion, etc., and perhaps even the very meanings of declarative sentences (relative to a context).⁴ Sometimes, these other kinds of content will become salient in the paper and I will have something to say about them, but when so I will make clear which kind of content I am talking about. To the extent possible, I intend on being non-committal about the nature of content. So not only will not I have much to say about the metaphysics of propositions, but I also will not assume this or that technical definition of content (e.g., the one advocated in Kaplan, 1977).

Furthermore, I will be pretty general about what I mean by desire. I will not distinguish between desires and wishes, for example, and I mean something similar about to what Davidson (1963) intends when he identifies a general sense of desire as a “pro-attitude”. Important for my purposes is that desiring is a psychological attitude with mental content, that we can talk about what satisfies the content of this mental state, and that we can rationalize agents’ behavior in part by appealing to this mental state. I take all of this to be fairly uncontroversial in the main—standard, even.

Lastly, it is worth stating that it is not the goal of this section to convince the reader that desire contents are temporal. Rather, it is to give a partial inventory of reasons to think that they are. Having rehearsed these reasons, I will simply treat the matter as given for the rest of the paper. This is not to suggest that the literature has reached a consensus on this point, but going quickly over this material will allow us to get to the main point of the paper, which I think has independent interest even if one remains unconvinced about desire temporalism.

Without further ado, here are three ways to reach the conclusion that desire contents are temporal.

2.1. Satisfaction Variability

The first reason to think desire contents are temporal is based on the simple observation that they are satisfaction variable—whether a desire is satisfied var-

² Put this caveat aside for now; it will be addressed later (cf. Section 3). For the notion of temporalism I have in mind, cf. the summary in Richard’s (1981).

³ So I will have little to say here about well-known problems in the literature on propositional attitudes pertaining to the likes of Frege problems and such.

⁴ I am being cagey about this point because there is a growing literature in philosophy of language which argues against identifying the meanings of sentences, as theorized about in semantics, with the objects of attitudes and illocutionary acts (cf. Rabern, 2012; Yalcin, 2014 for examples of such work).

ies across time. The significance of this observation comes into relief when comparing desires to their attitudinal kin, beliefs. Whether a belief is true or false depends on whether the content of that belief is true or false. By contrast, desires are not true or false, but that does not stop us from being able to give a parallel treatment of desires, based on evaluating the attitude's content. The key is to generalize the notion of a truth-condition to a more inclusive notion—that of a satisfaction condition—and to distinguish the manner in which belief and desire content relates to these satisfaction conditions. This is where direction of fit comes into play. An item of belief content is satisfied by “fitting” the world, where the content fits the world just in case it accurately represents the world. Desire content does not aim to fit the world, but still offers up a representation—a representation of the world were it to satisfy the particular desire the subject has. The fitting is then something the world would have to do (usually at the behest of the subject) in response to the desire. Were the world to “fit” this representation, the desire content would be satisfied, as would the desire, much as the truth of the belief content makes the belief true.⁵

The satisfaction variability of desire content is already suggested by the above remarks in nascent form. As I write these lines, the sky is overcast and dark clouds loom overhead. Consider my belief that it is cloudy. Its content is true, as per my description of the circumstances. Whether or not the content of this belief can change its truth value over time, depending on whether or not it is cloudy at different times, is a vexed question. Aristotle seemed to think that it could, as did the Stoics, but something of a consensus emerges in the philosophy of language in the 20th Century that propositions, and by extension, the objects of belief, do not change their truth value across time. In order for this to be the case, the time of my tokening of the belief, *t*, becomes part of the content of the belief, making the content *that it is cloudy at t*. This is a content that does not change its truth value across time; it is true or false eternally.

Of course, the discussion above rehearses the contours of the so-called temporalism/eternalism debate. Even though I plan on evoking this debate at some length, I here avoid commitment about whether belief contents are temporal or eternal. But notice that what is a vexed question for belief contents is a fairly trivial affair for desire contents. Whereas we could quibble about whether a belief's truth changes over time, it is uncontroversial that whether a desire is satisfied changes over time, depending on whether the content of the desire is satisfied at that time. Consider an agent's successful endeavor to satisfy their desire—like my own desire to listen to David Bowie's *Diamond Dogs* album. When I first develop the desire, it is not satisfied (insofar as its content is not satisfied). Then I undertake certain actions which result in *Diamond Dogs* playing in my vicinity,

⁵ The fact that this allows us to give a parallel treatment of attitudes like belief and desire is an advantage of direction-of-fit-talk. This notion of direction of fit comes from a suggestive example in Anscombe's (1957), and is construed in the manner described here by the likes of Platts (1979), Searle (1983), Smith (1994); although, cf. (Frost, 2014) for criticisms of this way of interpreting Anscombe.

and the desire is now satisfied—precisely when the content becomes satisfied. This kind of satisfaction variability indicates desire contents' temporal neutrality.

I can now say why I prefer to characterize desire temporalism in terms of a lack of a time indication, as opposed to another popular way of characterizing it—in terms of the ability to change truth values across times. I think that truth and satisfaction-variability is better seen as a symptom of temporalism than a characterization of it. If an item of content is true (or satisfied) when evaluated at one time, false (or unsatisfied) when evaluated at another, a good explanation of this fact is that the content lacks a time indication.⁶

This choice is not entirely innocent, perhaps. After all, some putative contents are truth- or satisfaction-invariant with respect to time simply because of what they are about. What should we say about these? For example, the content *that* $2 + 2 = 4$ is true whether evaluated at t or at t' , for any t, t' . Some people will want to say that such contents are eternal because they do not change truth value at different times. There is nothing wrong with setting up the terminology like this (particularly if your interest is in setting up a language free of context sensitivity). But, by contrast, I prefer to say that eternal sentences are those with a time indication. This does not mean we need to say that the content *that* $2 + 2 = 4$ has some specific time indication (like, Tuesday, March 26th, for example). It could have a time indication that involves quantification over all times and be eternal in virtue of this. My preferred way of characterizing temporalism leaves open the possibility that we can have desiderative attitudes towards such contents—one can want $2 + 2$ to be 4, for example. This is still consistent with desire temporalism, as long as this particular content does not contain a time indication. The take-away of this subsection is just this: truth and satisfaction-variability are an indication that a particular content is temporal. For beliefs, the matter is controversial. Not so for desires; we expect them to be satisfaction variable.⁷

2.2. Stampe's Insight

The next reason is closely related to the previous one, but its difference in emphasis causes me to discuss it separately. The point is articulated in work by Dennis Stampe (so I call it “Stampe's Insight”), but William Lycan has also emphasized the point as well in more recent work. Stampe, in his (1986), puts the point as follows:

⁶ Recall that one method of eternalizing sentences (cf. Quine, 1960, Chapter 6) involves explicitly inserting time indications.

⁷ The discussion of the last two paragraphs is just clarificatory. I do not think setting up these distinctions solves any difficult problems. Attitudes towards mathematical contents pose challenges for most theories of the attitudes, and in making the stipulations I do here, I do not thereby mean to imply that we will not need an additional account (e.g., like the one in Cresswell, 1985) to deal with them. I owe Thomas Müller, Verena Wagner, and an anonymous referee thanks for encouraging me to address some of these points more explicitly.

Suppose we have a tennis match set for tomorrow. I want to win and I think I will. These states of mind have the same content: my winning the match. But there is a difference: if my belief that I will win is going to turn out to have been true, then it will have been true—true, that is, even now, before the first point is played. (My belief that I will win, if it should be true, will not come to be true when I win). My desire to win, however, if it is to be satisfied, will come to be satisfied only when I win—that is, only at match point; only my having won will satisfy that desire. So even if I will win, my desire to win is not now satisfied; but my belief that I will win is true now if I am going to win, and my having won will not make it true (will not make it true, that is, that I will win). (Stampe, 1986, pp. 153–154)

What Stampe gets at with these remarks is that the satisfaction conditions of belief and of desire work in different ways. Assuming it is true, from one's temporal location, that one will win the match, then one's belief that one will win is already thereby satisfied in the relevant sense (since satisfaction for beliefs is just truth). If one desires to win, the current truth of this future winning is not material in quite the same way. That is, the truth of the content that one will win does not satisfy the desire. What satisfies one's desire is one's winning; the desire is satisfied when one wins.⁸

Is there any point of significance we can extrapolate from this observation? Lycan, in his (2012) brings the relevant point into even clearer relief when he says this:

Dennis Stampe has argued (1986, pp. 153–154) that a desire is not satisfied until its content proposition actually comes true. I now desire to be invited back to Victoria University of Wellington, for a fifth term-long visit. Suppose it is (in fact) true that in 2015 I will be invited back to Vic. Then my content proposition is true, but my desire is not yet satisfied. Someone might think that this is really only a psychological fact, in that I cannot be said to be satisfied on the point so long as I do not yet know that I will be invited. But Stampe's claim is stronger, in each of two ways: (i) It is still the desire itself that is not satisfied, not just me and my feelings, and (ii) even if I do come to know that I will be invited and so am happy, the desire itself will still not have been satisfied until I actually get the invitation;

⁸ There is considerable complexity that this discussion glosses over in assuming that the future contingent *that one will win* can be true. Proponents of the open future can reasonably complain that future contingents are neither true nor false, though they may become true or false. Such a point would suggest something like satisfaction variability even for belief. I acknowledge that this discussion sidesteps this complexity, but I think it is warranted since Stampe's point distinguishing belief from desire is still apposite. When talking about beliefs about the future, we might be forced to adopt an apparatus of truth value gaps or indeterminate truth values or what-have-you. But talk about desires does not require this apparatus; the corresponding desires are just un/satisfied full stop. This difference supports Stampe's contention that beliefs' and desires' satisfaction conditions work differently, even if we acknowledge this complication about beliefs about the future that Stampe otherwise ignores.

the present-tense truth of the content proposition is at least necessary for satisfaction. (Lycan, 2012, pp. 203–204)

What is illuminating in Lycan’s explanation here is his pointing out that the satisfaction of the desire is only affected by what he calls the “present-tense truth” of the content. Assuming it were true that Lycan would be invited back to Victoria University, this is not the thing that satisfies the desire. It is when the invitation comes to pass that the desire is satisfied, as I have pointed out above. Lycan’s claim about the “present tense truth” of the desire content being necessary for its satisfaction amounts to pointing out that we need to provide a particular time to evaluate the content. When we provide the present time as a point of evaluation, and the content is evaluated as true at this time, the desire is then satisfied. But needing to provide a time for the evaluation of the content simply is the property of being temporal.

This being said, Stampe’s and Lycan’s point here does not simply recapitulate the observation about satisfaction variability from the previous section. In saying that the “present tense truth” of the satisfaction conditions are necessary for the satisfaction of a desire, they make stronger claim. Not only do we find desires with satisfaction conditions that vary across time, as the previous subsection pointed out, but desires need to have this property. It is easier to see this point if you consider a simple case of intentional action, like my cuing up Diamond Dogs in response to my desire to listen to this David Bowie album. The satisfaction conditions of my desire need to be able to change (from unsatisfied to satisfied), otherwise my behavior will not be explicable in terms of my beliefs and desires at all. If my desire to listen to this album were (eternally) un/satisfied, then my endeavoring to get arrange the world in such a way that the desire is satisfied would look like a compulsion; effortful activity without any point, more like Quinn’s (1994) radioman or Anscombe’s (1957) collector of saucers of mud than a rational agent. If it were satisfied (and eternally so), my behavior would be superfluous when it comes to my desires, and so unintelligible as an effort to accomplish anything.⁹

⁹ Interestingly, I would draw a further conclusion that Stampe apparently does not draw: that the content of beliefs and desires are different. Notice, in the quote above, that Stampe denies that the belief and desire are different in content. But they are—the belief contains a time indication as part of the content whereas the desire does not, and Stampe himself provides an explanation that this is so (cf. Skibra, 2021). I take it Stampe misses this because the difference in content was immaterial to his ultimate goal in the paper. He wanted to provide an explanation of the difference between belief and desire, and the nature of the content of the attitude would not provide the basis for an explanation. This point can be true even if there is difference between the aforementioned belief and desire content, despite Stampe’s remark to the contrary.

2.3. The Modified Richard Argument

When discussing satisfaction variability, I said I would remain neutral on whether belief content was eternal or temporal. I also pointed out that the trajectory of the literature in 20th Century analytic philosophy has not remained neutral on that question. In the last decades of the century, the focal point for these discussions was a series of papers by Mark Richard (1981; 1982), which argued that evidence weighed heavily in favor of the eternalist construal of belief content. The idea is that, in our thought and talk, we seem to be able to quantify over and anaphorically refer to belief contents, and when we do, they seem to be eternal.¹⁰ Richard produces a number of examples to show that temporal propositions cannot work as the contents of our beliefs. A typical example involves an inference like the following:

- (1)
 - a. Josef believed that Clinton was president.¹¹
 - b. Josef still believes everything he once believed. Therefore:
 - c. Josef believes that Clinton is president.
- (2)
 - a. Josef believed that Clinton was president.
 - b. Josef still believes that. Therefore:
 - c. Josef believes that Clinton is president.

The problem is that these inferences are manifestly invalid. However, on a temporalist construal of propositions, they would be perfectly valid, and their manifest invalidity (or our unwillingness to assent to the conclusion on the basis of the premises) is difficult to explain. By contrast, if propositions are construed eternally, the inferences are both straight-forwardly invalid, and our unwillingness to draw these inferences is explainable on this basis. Richard's conclusion, also drawn by a number of philosophers of language subsequently (cf., e.g., Salmon, 1986; Soames, 2011) is that the evidence here suggests that belief contents are eternal, not temporal. Call this "the Richard Argument".

¹⁰ Certain features of this argument will not concern us. The debate has its origins in Kaplan's logic for demonstratives. In his (1977), Kaplan defines a theoretical notion of (semantic) content as a function from indices to extensions. Because Kaplan's logic contains temporal operators, the index contains a time parameter, and content is therefore temporally neutral. Kaplan also identifies his content with what-is-said in roughly the Gricean sense. Richard's intervention is to argue that this Kaplanian notion of semantic content cannot be the intuitive notion of content that aligns with what-is-said and with belief content.

¹¹ Alas, most readers of this paper will have lived through two Clinton U.S. presidential candidates—Bill and Hillary—so the attitude ascriptions here may strike one as ambiguous. Imagine Josef to be nostalgic for the 1990's, so the Clinton referred to in all these examples is Bill.

But now look what happens when you run one of the Richard inferences with a desire ascription.

- (3) a. Leni wanted Clinton to be president.
- b. Leni still wants everything she used to want. Therefore:
- c. Leni wants Clinton to be president.
- (4) a. Leni wanted Clinton to be president.
- b. Leni still wants that. Therefore:
- c. Leni wants Clinton to be president.

As a first observation, the inferences in (3) and (4) are absolutely fine. But if the reasoning in the Richard Argument is apt concerning the temporal properties of belief contents, then parity of reasoning suggests that because the inferences in (3) and (4) are fine, this provides a measure of empirical confirmation to the claim that desire contents are temporal. Call this the Modified Richard Argument.

There is much more to be said about these examples, how they compare, and what conclusions should be drawn from them. I will not undertake that here (but see Skibra, 2021). What matters for the present purposes is that if the comments in the earlier part of the section are on track, we would expect to find precisely this pattern of inferences with desire ascriptions. The Modified Richard Argument provides at least *prima facie* empirical confirmation of the claim advanced earlier.

The reasons canvassed above do not exhaust the reasons for thinking desire contents are temporal, but they are a good starting point. As I indicated earlier, from here on out, I will just suppose desire temporalism. If you are not yet convinced, it is not the point of this section to do so.

3. Standard Temporalism and Desire Temporalism

To reiterate, desire temporalism is a strong claim. Although it gets some measure of empirical confirmation via the Modified Richard Argument, it hinges on a conceptual claim about the way satisfaction conditions for desires work, both as a means of semantic evaluation and as a condition on their use in rationalizing behavior. The upshot of the foregoing discussion is that we need desire contents to be temporally neutral in a fairly strong way, and the way we need them to be makes them different from belief contents, even when they both concern the same event or event-type.

It is worth emphasizing that the claim being advanced here is a good deal stronger than the standard temporalist claim. Temporalists often advance the more modest existential claim that some attitudes admit of temporal contents. This in turn suggests the existence of temporal propositions to serve as these contents. Eternalists, on the contrary, claim that no contents are temporal, so propositions as a class of object are eternal. If the claim about desire contents were in keeping with the standard temporalist claim, it would simply be that there

are some temporal desire contents. But, again, the claim is that desire contents as a class are temporal. This is a universal rather than an existential claim. To distinguish it from the standard temporalist claim, I will call it “desire temporalism”.

Desire temporalism entails standard temporalism, but in a trivial and rather uninteresting way (assuming, that is, that there are desire contents at all); if all desire contents are temporal, then surely there are temporal contents. But desire temporalism has little to say about the contents of other attitudes, like belief, for example. It is entirely possible, as far as anything I have said goes, for desire temporalism to be true, but for belief contents to be eternal. It is for this reason that I have said earlier I would remain neutral on the temporal status of belief contents, though the possibility of temporal belief contents will come up later in the paper.

4. The Challenge of Temporal Adverbs

Given the strength of desire temporalism, it is tempting to challenge it—can we not obtain a counter-example somehow? Sure, the examples about Stampe’s wanting to win the tennis match, my wanting to listen to Diamond Dogs, and Leni’s believing/wanting Clinton to be president seemed plausible, maybe even compelling, but perhaps those examples are not fully representative of the range of desire contents and just happened to fit the proposed generalization pretty easily. Perhaps a different set of examples, or the same examples set up differently, could yield a counter-example. Armed with such a counter-example, it would remain to show where Stampe’s Insight goes wrong. But, if we could point to an eternal desire content, desire temporalism would then (at best) collapse into the standard, existential temporalist claim. There would be nothing distinctive about desire temporalism.

Perhaps desire temporalism is lent superficial plausibility by the fact that, in English, the attitude verb *want* takes infinitival complements. It would be premature to base desire temporalism on this observation, though. It would presuppose without argument that an absence of tense morphology in a clause corresponds to the lack a time indication in the resulting content, and would have little to say about languages where desire verbs take finite complements.¹² Thankfully, the considerations in favor of desire temporalism do not hinge on this observation, but given the strength of the thesis, one might look to desire ascriptions for a way to fashion a counterexample to the thesis.

You do not have to look for a long time for potential candidates, in fact. Regardless of the tense morphology in the complements of desire ascriptions, it is easy to come up with desire ascriptions containing expressions that seem to denote times—namely certain kinds of temporal adverbials, as with the examples in (5):

¹² There are languages where desire verbs can take finite complements, but in these cases the complement typically appears in the subjunctive mood.

- (5) a. Jill wants to have the money by tomorrow.
 b. Jill wants to go swimming next week.
 c. Jill wants Joe to win the election on election day.
 d. Jill wants to attend the concert on July 31, 2023 at 8:30 in the evening.

Might not any of these desire ascriptions describe a content that contains a time indication? And if any of them does, does not that fact undermine the claim that desire contents are temporal? We do not need to assume that desire ascriptions are transparent windows into an ascriber's desire content for this worry to get a purchase on us.¹³ The point merely concerns whether these expressions denote times and whether there is evidence that the time thus denoted indicates a time in the attitude content. I want to acknowledge that there are *prima facie* reasons to think this is in fact the case.

Absolute position adverbials. Consider an adverbial like *on July 31, 2023 at 18:30 in the evening* as in (5d). In Musan's (2002) taxonomy, such adverbials are absolute, position adverbs: they locate the position of temporal entities and specify them in a way that is not relativized to the context of utterance. Without going into detail about how this works just yet, it seems reasonable to suppose that absolute position adverbials add a time (the one they denote) to the semantic value of the sentence they occur in. If this is the case, we could suppose that they do this in the complements of attitude verbs as well. So, if these kinds of desire ascriptions are not horribly misleading as to the content they ascribe to the attitude holder, (5d) plausibly describes desire content that contains a temporal indication corresponding to the time denoted by the position adverbial, and the language of attitude reports provides a plausible counter-example to desire temporalism.

Indexical adverbials. Putting aside absolute adverbials, let us turn to relational adverbials, like *next week* or *by tomorrow*. If these expressions denote times, they do so in virtue of their relation to a contextually specified time. *Next week*, for example, indicates some time in a span of time that is 7 days from now; *by tomorrow* indicates some time before the time at which the day following the present day starts. This glosses over considerable detail—in particular about the fine-grained quantificational structure implicit in many temporal adverbials. For example, if I say that it rained last week, then this existentially locates an event of raining in an interval located a week prior to the present moment. (The truth conditions do not require it to be raining at every moment in that interval). Other adverbs have universal quantificational force, as does the durative adverbial for

¹³ We know there are difficulties with the idea that the complements of desire verbs transparently describe desire contents (cf., e.g., Fara, 2013; Grant, Phillips-Brown, 2020 on this point). The point about a temporal indication in the content is orthogonal to these other issues, I think.

two days in “It rained for two days”, where the truth conditions call for the raining event to occupy the entire span of the interval. I will largely abstract away from such details, even though they are important for a semantic account of temporal adverbs (though cf., e.g., Musan, 2002 for details).

We can make a finer grained distinction between these relational adverbs. Some of them, like *tomorrow*, seem like that have just as much claim to being grouped with paradigmatic indexicals as do the likes of *I*, *here*, and *now*. Assuming a Kaplanian semantics for such indexicals as in Kaplan’s (1977), these expressions have a kind of meaning (“character”) which is a function from contexts to its content. This means that the content of “I”, for example, will vary with different contexts; it denotes the agent of the context, whatever that context is. Given the context, though, this content does not shift under other intensional operators. Likewise, “here” and “now” denote the location and the time of the context, respectively. If “tomorrow” is also an indexical (denoting the time the day after the time of the content), this time is part of the content. On Kaplan’s picture, then, temporal indexicals supply times to the content of the expression. Assuming this happens in desire ascriptions, we would have another instance of a desire ascription that militates against desire temporalism.

Reflections on temporalism/eternalism. Harking back to the temporalism/eternalism debate, we can point out that temporalists have typically denied, while eternalists have affirmed, that the proposition expressed by (6a) is temporally specific. An eternalist will tend to make the case that the semantic content of (6a) contains a time indication of the moment of its tokening as part of the content—we can think of tense morphology as providing this time indication, if we are so inclined. On this eternalist conception, (6a) is equivalent to (6b), where the adverbial *now* specifies the time explicitly. While temporalists deny that (6a) has a time indication as part of the content, they are happy to admit that (6b) does, in virtue of the explicit temporal adverbial.¹⁴ Here, again, a temporalist will remind us that their claim is an existential one, so they are not bothered if some sentences denote eternal contents: (6b) can be eternal, so long as they do not have to admit that (6a) is eternal.

- (6) a. It is raining.
 b. It is raining now.

How this applies to our current question should be fairly obvious. Some temporal adverbials seem to denote times, and they do so in a way that even a standard temporalist would acknowledge affects the proposition expressed by the sen-

¹⁴ The debate is characterized like this in Brogaard’s (2012, Chapter 2). A temporalist like Prior seems to have had a more complicated view of the role of *now* and temporal adverbials (cf. Prior, 1968). But for now I just want to point out that some prominent temporalists themselves accept that temporal adverbials provide time indications to content.

tence. This is so for the examples of unembedded matrix sentences like those in (6). But if they express the same kind of proposition when embedded under attitude verbs, like we see in (5), then we have reason to think that the attitude ascription describes a relation between the ascriber and a proposition with a time indication after all. If *now* provides a time indication to the proposition expressed by the sentence, would not we expect the same of other temporal adverbials with an indexical semantics?

Expression adjustment. Frege (1956) gives us another reason to think that time indications are part of the content in a famous passage from *Der Gedanke* where he says,

If someone wants to say the same today as he expressed yesterday using the word “today”, he must replace this word with “yesterday”. Although the thought is the same its verbal expression must be different so that the sense, which would otherwise be affected by the differing times of utterance, is re-adjusted. (1956, p. 296)

The point he makes in this passage is that when a time indication is part of the proposition one expresses or entertains, one will have to adjust the means by which one expresses the time indication at different times.

Having to adjust an expression when the context changes is just what we would expect from the behavior of other indexicals. If I were to communicate the proposition you express by uttering “I am hungry”, I would have to utter “She is hungry”, in communicating the proposition I uttered yesterday. Having to adjust the expression in that manner seems like evidence that the time indication is part of the proposition. At least, this much is suggested by Frege’s remark that the adjustment allows one to express the same proposition. Frege famously held that propositions were necessarily eternal, as these are the primary bearers of truth and falsity, and truth was of necessity a monadic property.¹⁵ We see the same need for expression adjustment when we embed sentences with relational temporal adverbials under attitude verbs like *want*, as shown in (7).

- (7) a. John wants it to rain.
 b. John wants it to rain next week.
 c. John wanted it to rain last week.

Suppose John has a tennis match scheduled against Dennis Stampe, and he is dreading the outcome, since he is almost certain to be crushed. He is hoping for a rainy day so the match is canceled. The desire ascription in (7a) seems reasonable and true in such circumstances. If the dreaded match is next week, we may

¹⁵ Frege’s insistence may be the source of the preference for eternalism that emerged in the 20th Century (for a reconstruction and evaluation of Frege’s arguments on the matter, cf. Carruthers, 1984).

even offer the ascription in (7b), specifying the time at which John wants the rain to come. If two weeks then pass and we are again describing this same desire, we may opt for (7c) making just the kind of adjustments Frege suggests.

In the face of these kinds of considerations, it may seem that (7a) describes a desire with temporal content, much as I argued earlier in the paper, but that (7b) and (7c) indeed describe desires whose content includes a time indication provided by the temporal adverbial, and so is not temporal.

Moreover, we might even leverage this observation to undercut one bit of evidence in favor of desire temporalism cited before. Recall the Modified Richard Argument from Section 2.3, repeated here as (8).

- (8) a. Leni wanted Clinton to be president.
- b. Leni still wants that. Therefore:
- c. Leni wants Clinton to be president.

The point of this example was that the inference in (8) sounded fine, even if the belief-variant of it sounded terrible. If the inference in the belief-variant is bad because the ascribed belief content is eternal, then we can take the fact that (8) is a fine inference as evidence that the ascribed desire content is temporal. This point still stands. But note that adding adverbials complicates this simple picture.

Consider John again, and his dread in facing Stampe in the upcoming tennis match. Now consider the variation on the Modified Richard Argument in (9).

- (9) a. John wanted it to rain in two weeks.
- b. John still wants that. Therefore:
- c. John wants it to rain in two weeks.

Suppose the following. The John/Stampe match is scheduled a week from today. John confessed his desire for it to rain to you last week, and you know he has not had a change of heart. The inference in (9) sounds bad, given the interpretation supported by these circumstances. What would actually sound like a good inference is for (9) is the following conclusion.

- (9) c'. John wants it to rain in a week.

So, we are forced to acknowledge that Frege's point about expression adjustment can be brought to bear on the Modified Richard Argument in a way that undercuts part of our support for desire temporalism.

Having raised these considerations, we can put the objection to desire temporalism like this. At least some temporal adverbials denote times. There are true desire ascriptions with temporal adverbials. The times denoted by these temporal adverbials correspond to the time indications in the content ascribed to the atti-

tude holder in the desire ascription. So, there are desire contents with time indications, and desire temporalism is wrong.

If this objection is sound, then we would have some explaining to do. One might find the following conciliatory position tempting: maybe the most the considerations from Section 2 will support is something like standard temporalism. Some desire contents are temporal and some are eternal. This would allow us to save what seemed on the right track about the satisfaction variability of desire and explain the initial data provided by the Modified Richard Argument. But the conciliatory position would still refute desire temporalism. And we would still need to explain where the reasoning about Stampe's Insight goes wrong.

5. Adverbs and Circumstances of Evaluation

In the rest of the paper, I will defend desire temporalism from the objection presented in the last section. I develop this defense by means of a two-pronged approach, first discussing attitude content and then the semantics of tense. On the first prong, I will do so by denying that the times denoted by the temporal adverbials correspond to time indications in the content of the desire. I will argue, instead, that we can understand them as doing something else—as contributing to the circumstance of evaluation relative to which the content is assessed. When this is taken into account, we find desire temporalism unscathed.

How to argue that temporal adverbials do not contribute time indications to desire contents? The proposal I advance in response to the challenge posed by temporal adverbials is quite similar to the one proposed in a footnote in (Skibra, 2021). There I claimed that such examples as found in (7):

[P]ose a problem for [desire temporalism] insofar as it seems to us that the temporal adjunct specifies a time as part of the desire's content. But here is another possibility—the time indicated by the adjunct is not actually part of the desire's content. It serves a different role in relating the content of the attitude to a time. Instead of contributing to the content, what the temporal adjunct does is circumscribe candidate times at which that content might be satisfied. (Skibra, 2021, p. 296)

The suggestion is not developed any further, so it might be difficult to get a grasp on what exactly was being proposed there.

As I see it, the idea is that content is what we evaluate as being true or false (or satisfied or unsatisfied, as the case may be). To draw upon Kaplan's account (1977), content is evaluated against a circumstance of evaluation. In the simplest case, where the item of content in question is an eternal proposition, content is neutral with respect to a world parameter (indeed, this is why we can represent [eternal] propositions as sets of possible worlds). To evaluate this kind of content, we simply provide a world relative to which the we can determine a truth value. If we consider the attitude of belief, what it means for one's belief to be true is for the content to be evaluated as true at the possible world where the belief takes place. Desire temporalism requires that we assess desire contents relative to a cir-

cumstance of evaluation that consists of (at least) a world and a time. What the proposal above suggests is that the temporal adverbials we see in desire ascriptions do not specify a time indication in the attitude content, but instead describe a constraint on the temporal coordinate of circumstance of evaluation.¹⁶ For example, if we say that *John wants it to rain next week*, we ascribe to John the (temporal) desire content that it rain, and we constrain the putative satisfaction conditions to a time occurring within the interval *next week*.

This is, so far, still quite vague. But it turns out that the proposal I am offering here looks a bit like what Brogaard (2012; 2022) has defended in recent work under the description of “composite tense operators”. Because of this, it is worth looking at Brogaard’s proposal in some detail, both to flesh out the current proposal, but also to point out ways in which what I am suggesting ultimately differs from Brogaard’s proposal.

This brings me to the second prong of the approach. I will need to address the worry that the explanation I offer of what temporal adverbials are in fact doing in desire ascriptions presupposes a semantics of tense that is at odds with the dominant line of research which treats tenses as pronouns. Such a worry is emblematic of a position in the philosophy of language (cf., e.g., King, 2003; 2007; Stanley, 2007) which takes the pronominal view of tense as decisively favoring eternalism over temporalism across the board.¹⁷ If this is right, one could maintain desire temporalism only at the cost of admitting a strong disconnect between attitude contents and the means of talking about them in language. To counter this line of argument, I will not take any issue with the pronominal view of tense. In fact, after discussing Brogaard’s operator-based proposal, I take on the pronominal theory of tense anyway. But I will argue that, contra what is often supposed in the philosophy of language, the pronominal view of tense actually supports the picture I am advocating. Still, there will be parallels between Brogaard’s proposal and the one advanced here.

6. Composite Tense Operators

In numerous works, Berit Brogaard has defended (standard) temporalism against the kinds of objections and challenges that have caused philosophers to prefer eternalism (Brogaard, 2012; 2022). A particularly salient objection, and Brogaard’s response to it, will be the focus of this section of the paper. It is salient in part because it also deals with temporal adverbials, and their interaction

¹⁶ This kind of “circumstance dependence” has figured in the work of Recanati (2004; 2007).

¹⁷ Cf.:

Most philosophers of language, and even many linguists, still accept that modals are operators of some kind (and so worlds are features of circumstances of evaluation). But, [...] most linguists hold [...] that tenses are not operators, and times are part of semantic content, rather than being features of circumstances of evaluation. (Stanley, 2007, Chapter 7)

with tense operators. Part of Brogaard's angle is an advocacy for an operator theory of tense, according to which natural language tenses are like the operators of tense logic (cf. Prior, 1968)—an approach adopted in the early papers by Montague (1974) and by Kaplan (1977). According to this approach, which I will only sketch briefly, past tense and future tense are schematized as in the (b) sentences in examples (10) and (11) with past (*P*) and future (*F*) operators (glossed “It has been the case that...” and “It will be the case that...”, respectively). These operators operate on tenseless sentences, so that the (b)-sentences yield the truth conditions in the metalanguage interpretations in (c).¹⁸

- (10) a. John ate an apple.
 b. *P*[John eat an apple].
 c. There is a time *t'* preceding the time of evaluation *t* such that *John eat an apple (t') = 1*.
- (11) a. John will eat an apple.
 b. *F*[John eat an apple].
 c. There is a time *t'* following the time of evaluation *t* such that *John eat an apple (t') = 1*.

A key challenge for the operator view is made plain in King's (2003; 2007) discussion of an example from Dowty's (1982). The operator view apparently gives the wrong truth conditions for nested temporal operators; in particular, for sentences containing both tense operators and operators for temporal adverbs. Consider (12):

- (12) Yesterday, John turned off the store.

If we were to render the past tense in (12) as *P* and treat the adverb *yesterday* as an operator, *Y*, there are two scope possibilities these operators could take with respect to the clause they operate on, given in (14a) and (13a).¹⁹

- (13) a. *Y*[*P*[John turn off the stove]].
 b. (13a) is true at evaluation time *t* iff there is a time *t'* included in the day before *t*, such that there is a *t''* before *t'* such that *John turn off the stove (t'') = 1*.

¹⁸ In sketching this theory, I omit talk of models for tense logics almost entirely. In doing so, I will not address the kinds of questions that occupy many tense logicians. But those issues are mostly orthogonal to the objection we will be discussing.

¹⁹ Take *Y* ϕ to be true just in case ϕ is true when evaluated at *t'*, such that *t'* is within the day preceding the day of the time of evaluation, as in King's (2003, p. 216).

- (14) a. $P[Y[\text{John turn off the stove}]]$.
 b. (14a) is true at evaluation time t iff there is a time t' preceding t at which there is a time t'' the day before t' such that *John turn off the stove* (t'') = 1.

Both of these scope configurations yield obviously incorrect truth conditions. (13a) takes us to a time the day before the time of utterance, and then to some time before that, and says of this time that John turns off the stove. (14a) takes us to some time before the time of utterance, and then at a time the day before that, John turns off the stove. In both cases, John's turning off the stove is earlier than the intuitive interpretation of (12) would have it. Intuitively, (12) is true just in case John turned off the stove at some past time within the interval of the day before today.²⁰ King provides such examples to make the case that tense is not an index-shifting operator, but something more like an object language pronoun in the style of Partee (1973), Enç (1986; 1987), and others, or a quantifier over temporal variables, as in Ogihara's (1996). My focus here will be on the pronominal theory of tense.²¹ Like individual pronouns, the thought goes, tenses contribute variables ranging over times (or intervals) to the Logical Form of the sentence. On such a view, it is fairly easy to yield truth conditions that corroborate our intuitive interpretation of (12). We simply render the adverbial *yesterday* as a predicate of times which modifies the extension of the pronoun, as in (15).

- (15) (12) is true just in case John turns off the stove at $t < s^*$ and $t \subseteq$ day before s^* , where $<$ is the precedence relation and s^* is the designated speech time.

King's motivation in pointing out this apparent advantage of the pronominal view over the operator view does not merely have to do with concerns about the

²⁰ A reviewer raises a good point. My treatment of the operator Y does not make *yesterday* directly referential, as in Kaplan's account (1977), and as suggested in Section 4 of this paper. One should distinguish between an operator Y which picks out a time within the day before the time of the context (without invoking the time of evaluation at all), and another operator (let's call it G) which means something like *one day ago*, and is defined as I did in Footnote 19. $P[G[\text{John turn off the stove}]]$ would have the truth conditions described in (14b). But, as King (2003, Footnote 42) himself acknowledges, a Y operator, defined as the reviewer suggests, would give the correct truth conditions for (12) when in the scope configuration in (14a). I put the point aside, though, for the reasons given by King. First, a Y operator so defined would still allow for a scope ambiguity where none exists for (12). Second, since this Y operator effectively ignores the index-shifting of tense operators scoping above it, $F[Y[\text{John turn off the stove}]]$ would also yield the correct truth conditions—a strange and undesirable result. So, even admitting a directly referential Y operator, the interpretation of (12) is still troublesome when tense and temporal expressions all treated as operators. Thanks to the reviewer for raising to point.

²¹ But I suspect the main points of the present paper can be made with Ogihara's quantifier theory as well.

empirical adequacy of theories of tense in natural language. He also takes it as confirmatory evidence in favor of eternalism about the semantic content. The reasoning behind this is as follows. If tenses are operators, they need to operate on temporally neutral sentences. This is the famed operator argument of Kaplan (1977; also endorsed in Lewis, 1980). As a consequence, we would have circumstances of evaluation (indices) that include times, and the output of compositional semantics will be an object that varies (*inter alia*) over times. However, if tenses are temporal pronouns and not operators, circumstances of evaluation will not include a time coordinate; there would be no need. So, the content of a sentence would not be defined as a function from worlds and times to truth values (or sets of world-time pairs). Instead, if a circumstance of evaluation only includes a world coordinate, the semantic content of a sentence in a context is simply a function from worlds to truth values (or, equivalently, a set of worlds). This is an eternal proposition. So, the reasoning continues, the superiority of the the pronominal theory of tense amounts to a reason to endorse eternalism over temporalism when it comes to the semantic value of sentences in context. We will come back to the pronominal theory of tense later in the paper; for now, I want to focus on Brogaard's response to the challenge.

Brogaard aims to maintain an operator theory of tense in the face of King's challenge, and proposes a theory of composite tense operators to meet it. According to this proposal, tense operators like *P* and *F* are basic tense operators, and adverbs that appear with these basic operators modify them. To get a handle on the motivation for composite tense operators, it helps to clarify the precise challenge nested temporal operators pose for the operator theory. Take the example cited above in (12) with the past tense *P* operator and the adverbial *yesterday*. The problem takes the form of a dilemma: the adverbial can either provide a time to the content that is operated on by the *P* operator, or it can provide an operator to the sentence, in addition to *P*. Neither of these options is acceptable to the proponent of the operator theory. The first option is ruled out on account of it making the content eternal, whereupon the operator would be otiose (this is essentially the situation described in Footnote 20), and the second is ruled out on account of it making erroneous predictions about the truth conditions of the sentence, as we saw above.

Brogaard's proposal about composite tense operators suggests that these two possibilities do not exhaust the options for operator views of tenses. On her proposal, adverbs like *yesterday* neither add to the content to be evaluated, nor do they provide an operator to enter into scope relations with the operator *P*. What they do instead, is combine with and modify basic tense operators to form composite tense operators. In general, if *A* is an adverbial modifier, *P* is the basic past tense operator, and ϕ is a sentence, then " $\ulcorner AP\phi \urcorner$ maps to true iff ϕ is true at a past

circumstance of evaluation whose class of times belong to the class of times picked out by A' ” (Brogaard, 2012, p. 92),²²

Composite tense operators allow Brogaard to respond to the challenge of nested temporal operators by rejecting the dilemma they seem to force on the proponent of the operator view. If P and Y form a composite tense operator, $P-Y$, where Y modifies the past tense operator, then (12) is interpreted as follows:

- (16) a. $P-Y$ [John turn off the stove].
 b. (16a) is true at evaluation time t iff there is a time t' preceding t such that t' is the day before t and *John turn off the stove* (t') = 1.

This seems to evade the challenge. There are not two operators here that can alternate in their scope configurations. As a result, we do not find scope ambiguities leading to erroneous interpretations. Additionally, we are not forced to say that the adverbial denotes a time as part of the content of the sentence that operator takes as an argument.

The precise role that temporal adverbs play in composite tense operators can be thought of as modifiers of circumstances of evaluation: if basic tense operators shift the time coordinate of the index from the contextually given index to evaluate the embedded sentence at a shifted index, then temporal adverbials further modify the shifted indices to constrain the target circumstance of evaluation. Says Brogaard: “[T]hey help to indicate which time to look at when evaluating the intension of the operand sentence” (Brogaard, 2012, p. 90). It is precisely this role that I find suggestive in Brogaard’s proposal, as it parallels what I was suggesting in the comments in the last section for how to deal with temporal adverbs in desire ascriptions as modifying the circumstance at which the content is evaluated.²³ In saying that temporal adverbials in desire ascriptions do not specify a time as part of the content, but instead circumscribe candidate times at which the content is to be satisfied, this is the relation of a modifier of a composite tense operator to the sentence that the whole composite tense operator operates on. I take it, therefore, that Brogaard’s notion here nicely illuminates the suggestion about desire content I leveraged to respond to the objection.

Still, there is a difference between what I was proposing and what Brogaard proposes. My proposal has to do with desire content, and a way of interpreting desire ascriptions in light of commitments about that content. Brogaard, as I take it, offers a theory of natural language tenses. This explains the desire on her part to accommodate a sense of semantic content of sentences in context that is tem-

²² Brogaard also considers a kind of operator formed with durative or frequency adverbials that map not to times but to intervals, which are the “span operators” discussed by Lewis (2004). I will omit discussion of these and focus on the composite tense operators for position adverbials. I draw upon Brogaard’s theory for illustrative purposes, so focusing on composite tense operators will be sufficient to make my point.

²³ To be clear, Brogaard’s proposal predates my own. In (Skibra, 2021), I failed to appreciate the parallel.

poral. She accepts, and King denies, that the output of compositional semantics is a semantic object that varies in truth conditions across times. While I find the proposal Brogaard makes about the role of temporal adverbs useful for my purposes, I do not think I can follow her in taking this composite operator strategy as a theory of tense for natural language.

7. Some Skepticism About Composite Tense Operators

The goal of articulating an empirically adequate semantics of tense in natural language is not simply to generate the appropriate truth conditions for sentences. The task is concerned with how these truth conditions are arrived at compositionally. I do not have much to say about whether or not the composite tense operator view can make good on this constraint.²⁴ My worry is a more basic one.

Returning to the motivating example, in (12), the composite tense operator, P - Y , is composed of the basic tense operator P and the modifier, Y . As was made clear earlier, Brogaard takes this proposal about composite tense operators as a way of defending temporalism about semantic content more broadly. I have already made clear how it allows one to say that the arguments of such composite tense operators are temporally neutral. However, if one is defending temporalism about semantic content, one will also want to argue that the expression which results from composing the composite tense operator with its argument is also temporally neutral. This is how basic tense operators behave—if ϕ is a temporal sentence and P is the past tense operator, then $P\phi$ is also temporal. It is evaluated the same way that ϕ is—by providing a time relative which the sentence is evaluated. If $P\phi$ were the schematization of a natural language utterance, we would expect the time relative to which the sentence is evaluated to be the time of the context. In providing this time, context plays what Belnap, Perloff, and Xu (2001) call an initializing role (cf. also Recanati, 2007 for a discussion of this role of context). We would then expect composite tense operators to behave in much the same way.

The problem is, it is hard to see how composite tense operators could behave in the same way. We are invited to think of P - Y as an operator, even if a composite one. Assuming a broadly Kaplanian picture of semantic content (Kaplan, 1977), this means that P - Y operates on an item of content, and that the resulting expression is also an item of content. But, on this Kaplanian notion of content, the semantic value of indexical expressions (relative to a context) is already part of the content of the complex expressions containing them. This is essential to Kaplan's way of framing his project. When we evaluate the sentence *I was here*

²⁴ Zeman (2013) raises a relevant point here that construing tense and temporal adverbials as composite tense operators may not be supported by empirical evidence about natural language syntax. If not, the actual syntax of tense and temporal adverbials may not provide a mapping from the Logical Form of the sentence to formulas with composite tense operators. This would make it difficult to say that tenses and temporal adverbials in natural language work like composite tense operators.

(schematized $\ulcorner P[I \text{ be here}] \urcorner$), the past tense operator shifts the time of evaluation of the content of the embedded sentence. In other words, we evaluate whether the denotation of *I* relative to the context is at the denotation of *here* relative to that context at some circumstance of evaluation at an earlier time. (Equivalently, we evaluate whether the speaker of the context is at the location of the context, at that earlier circumstance of evaluation). This means that semantic evaluation occurs in a particular order; first the semantic values of indexicals are determined relative to the context, then context can play its initializing role in providing the time of evaluation.

Given this, it is hard to see how sentences with composite tense operators are indeed temporal when the expressions supplying the modifying portion of the composite operator are temporal indexicals. This seems a problem, because there are candidate composite tense operators which would contain temporal indexical adverbs: *yesterday*, *now*, *today*, *tomorrow*, etc. In the broadly Kaplanian framework I am assuming here, we would apparently have to say something like this: when $P\text{-}Y\phi$ is a sentence with ϕ a sentence and $P\text{-}Y$ a composite tense operator (formed by means of the past tense operator P and the adverbial *yesterday*), the context initializes the time of evaluation relative to which $P\text{-}Y\phi$ is evaluated, but the content of $P\text{-}Y\phi$ contains the day before the day of the context as part of the content. I have been very loose with what counts as a time indication, but this sounds like one if anything does, and so it seems a stretch to say that the content of the complex expression $P\text{-}Y\phi$ is temporal.

Perhaps there are ways of resisting the difficulties described above. The options are not clear to me. One might deny the Kaplanian semantics for the likes of *yesterday*. I do not think Brogaard intends to deny this, and it would be nice to avoid having to do so for the sake of composite tense operators.

8. Interim Summary

At this point, it would be helpful to take stock of where we find ourselves dialectically. I have introduced desire temporalism and given some reasons for thinking desire temporalism is true. I have stressed that desire temporalism is stronger than standard temporalism (when it comes to the attitude of desire, that is), since it claims that desire contents need to be temporal if they are indeed the satisfaction conditions of desires. Given the strength of this position, I asked whether we had any reason to doubt it—whether any putative counterexample was to be found. When we considered desire ascriptions with a certain kind of temporal adverbial (those which could be thought to supply a time indication to the content), I suggested that such ascriptions could be leveraged to fashion an objection to desire temporalism.

From there, I followed a suggestion from Skibra (2021) which held the promise of evading the objection. However, since the suggestion was pretty vague, I fleshed it out by means of Brogaard's work on composite tense operators. While the composite tense operator story might say what we want to say about

the content embedded under the tense operators, I gave some reasons for thinking this story about composite tense operators will not work as a theory of natural language tenses more broadly. At least as far as the discussion in the present paper goes, the pronominal view of tense is on better footing when it comes to the semantics of tense in natural language.

Dialectically, this leaves us in a precarious position. The pronominal view of tense, as I have said, has been argued by philosophers to strongly corroborate an eternalist picture of semantic content, since the temporal pronouns provide a time indication to the semantic content of the sentence. So, it might seem at this point that there is little latitude to defend desire temporalism from the objection.

It turns out, I will argue, that the framing of the dialectic just given overstates the case against desire temporalism dramatically. Instead, the pronominal view of tense actually gives us considerable resources to accommodate desire temporalism. Once we avail ourselves of these resources, and we pay attention to some of the work on embedded tenses in the pronominal tense framework, desire temporalism actually comes out looking pretty good. Furthermore, it will turn out that the discussion of composite tense operators will not have been an unhelpful digression. Even if composite tense operators do not give us the semantics for natural language tenses, they can still provide a helpful way to think about the way embedded tenses under attitude ascriptions can work.

9. Pronominal View: Nuts and Bolts

In this section I will outline the pronominal view of tense. The aim here will be to set out the main motivations for taking natural language tenses to be pronominal, and in subsequent sections, I will describe some central strands the research utilizing this framework has taken. Eventually, I will try to make good on the promise I made in the last section of vindicating desire temporalism. But for now I just want to lay out the nuts and bolts of the view.

First, the fundamentals. The classic observations motivating the pronominal theory of tense come from Partee (1973). Partee notes that perfectly natural uses of the past tense would be quite odd if they had the denotation given to them on a typical operator theory. Returning to a variation on our stove example, imagine a person driving in their car, and just as they merge onto the highway, they turn to the passenger and utter (17).

(17) I did not turn off the stove.

Assuming a view whereby P , the past tense operator, scopes over *I not turn off the stove*, and has the meaning as a kind of meta-language quantifier over times, (17) would have an almost trivial denotation—that there is some time or other prior to the time of utterance at which it was true that the speaker was turning off the stove. Such truth conditions are much too weak—it is hard to think of

someone for whom they would be false.²⁵ A typical use of (17) has the speaker intending to say no such thing. Instead, it is much more intuitive to take the speaker of (17) to be referring to a particular time—say, the time just before leaving the house—and saying of that time that it was one where the stove was not turned off.²⁶

What this observation suggests is that tenses can have a deictic meaning, which works like the deictic interpretation of pronouns. Correspondingly, much like how awareness of the relevant contextual features allows a hearer to determine which time is being spoken about in (17), a similar kind of awareness allows a hearer to know what person is being spoken about by means of the pronoun in (18):

(18) She left me.

The analogies between tense and pronouns do not end there. First, tense enters into anaphoric relationships, and second, it can be bound, two other features of pronouns.

- (19) a. Sheila had a party last Friday and Sam got drunk.
 b. Sheila borrowed my display cable during the last conference and Sam is borrowing it today.
- (20) a. Whenever Susan comes in, John immediately leaves.
 b. If one of those arrows hits the target, it is mine.

Much like in (19b), where the pronoun *it* is anaphoric on *my display cable*, in (19a) the time at which Sam got drunk is anaphoric on the time at which Sheila had the party. Likewise, in (20b), the pronoun *it* is bound in the antecedent of the conditional, and in (20a), the time of John's leaving is bound by the relative clause "whenever Susan comes in".²⁷

²⁵ Or, the negation could outscope the past tense operator, resulting in the almost certainly false interpretation that it is not the case that I turned off the stove at some point in the past.

²⁶ This interpretation of (17) is indeed the most natural one, but it is not the only way to interpret the past tense. There is still a perfectly good "existential" interpretation of the past, as when someone utters "I went to Paris", intending to communicate that there is a time in the past at which they went to Paris. This kind of interpretation is much closer to the kinds of truth conditions the standard operator theory would give past tense. So, evidently, an account yielding such an interpretation is still needed in some cases, but Pardee's point is that there are plenty of instances where such truth conditions would not give us the intended interpretation.

²⁷ Kratzer (1998) argues that yet another parallel between pronouns and tense is that both can have a "zero" interpretation, where a zero pronoun is one that lacks phi-features and so has no presuppositions. Such zero tense pronouns would be very helpful for the story I ultimately tell in the final sections of this paper, but I will not pursue the matter here.

The pronominal view of tense takes these parallels seriously, and treats tenses as pronouns. Implementing these insights requires having an account of pronouns, and we can go with account in Heim and Kratzer's (1998), where pronouns are indexed by a number. The index on a pronoun helps resolve its denotation (indices with the same number are co-referential), and is important for various kinds of constraints on how pronouns can be bound. But it also makes for a rather straight-forward way to give a semantics for pronouns, by using the variable assignment, which is needed independently to give the semantics of quantifiers. We relativize the interpretation function to a variable assignment, g , and give the denotation to an indexed pronoun as follows:

$$(21) \llbracket he_n \rrbracket^g = g(n).$$

Bracketing quantifiers, the variable assignment takes indices and maps them to objects. So, in (21), g maps the index n to the object referred to by the pronoun (more precisely: the n^{th} object in the sequence given by g).²⁸ Where does this assignment come from? It turns out that there is some controversy about this (cf., e.g., Rabern, 2012), but for our purposes we can just recapitulate the line from Heim and Kratzer's (1998) and say that it determined by the context. That is, the context puts constraints on what would count as an appropriate variable assignment. This would corroborate our intuition that, for deictic uses of pronouns, the context plays a role in determining the referent of the pronoun. (By contrast, indexical pronouns get their denotations directly from the context without the need of a variable assignment).

We can say much the same thing for tenses, where tense morphemes in language introduce an indexed pronoun into the Logical Form of the sentence, which is then interpreted the same way as the individual pronoun above.²⁹

$$(22) \quad \text{a. } \llbracket \text{past}_i \rrbracket^g = g(i). \\ \quad \text{b. } \llbracket \text{pres}_i \rrbracket^g = g(i).$$

This tells us a little bit about the implementation of the idea that tenses introduce time pronouns, but clearly something more is needed. According to what we have so far in (22), past and present tense have pretty much the same semantic meaning (modulo whatever index they happen to have). However, there is clearly a difference between the times past and present tense can refer to; they are not interchangeable.

Again, individual pronouns provide a natural option for modeling these constraints; for the pronoun he_n , g cannot map n to just any object. Taking (21) as an example, the pronoun he_n is mapped by a variable assignment to some object

²⁸ To be clear, this use of "index" is a bit different from the use of "index" earlier in the paper, as a sequence of parameters that give us circumstances of evaluation. Here, we just mean: a number that allows us to keep track of different variables.

²⁹ I will use i for the temporal indices.

$g(n)$, but the word *he* places some constraints on its interpretation. Namely, *he* tends to refer to individuals of a masculine gender.³⁰ We treat this constraint as a presupposition and incorporate it into the framework by saying that the interpretation function $\llbracket \cdot \rrbracket$ is a partial function, and is defined for he_n only if $g(n)$ is masculine. If so, then it is defined as stated in (21). The same idea can give content to the intuition that past and present tense morphemes have presuppositional constraints on their interpretation.³¹

- (23) a. $\llbracket \text{past}_i \rrbracket^{c,g}$ is defined only if $g(i) < t_c$. If defined, $\llbracket \text{past}_i \rrbracket^{c,g} = g(i)$.
 b. $\llbracket \text{pres}_i \rrbracket^{c,g}$ is defined only if $g(i) \sigma t_c$. If defined, $\llbracket \text{pres}_i \rrbracket^{c,g} = g(i)$.

This effectively adds the presupposition that present tense overlaps the time of the context, t_c , and that past tense precedes the time of the context.

We need to say just a bit more before we have the nuts-and-bolts version of the pronominal view on the table. We need to say how these time pronouns find their way into the LFs of sentences. One thing to say (cf. Heim, 1994) is that verbs have argument positions for times, in addition to their thematic arguments. The example Heim gives is with the verb *cry*. It is an intransitive verb, and as part of its thematic grid, has an argument position for an agent. On this picture, it also has an argument position for an event time. If we give times their own primitive type (type i , for interval), and $\langle s, t \rangle$ is the type for propositions ($\langle s, t \rangle$ is a function from worlds to truth values), then the verb *cry* has the type: $\langle i, \langle e, \langle s, t \rangle \rangle \rangle$ —it is a higher order function from a time to a function from entities (the primitive type e) to a function from worlds to truth values. Alternatively—it takes a time and an agent argument, and gives you a proposition as shown in (24).³²

- (24) $\llbracket \text{cry} \rrbracket(t)(x)(w) = 1$ iff x cries at t in w .

This is the pronominal view in a nutshell. And when we put things in this way, it is hard to think that there is any room for any kind of temporalism. Why so? Because times find their way into the LF in much the same manner as individuals do with deictic individual pronouns, and we do not tend to think that the denotations of such sentences are individual-neutral.³³ But in fact, this is the starting point for most contemporary work on tense, instead of the final word. While the general framework gives us what is desired in terms of making tense a kind of pronoun, a slightly deeper dive into the semantics of tense shows us

³⁰ The features giving rise to these constraints are called phi-features and play an important role in theories of agreement in syntax.

³¹ Take $<$ to be the relation “wholly precedes” and σ to be “overlaps”.

³² Note: I have suppressed the parameters on the interpretation function here for readability.

³³ Some pronouns might in fact be individual-neutral (cf. Chierchia, 1989; Schlenker, 2004). Put this aside, though.

this simple picture is in need of a bit more sophistication. It is this sophistication which will wind up helping us with desire temporalism.

10. Limitations of the Nuts-And-Bolts Theory

The problem with the nuts and bolts version of the pronominal view is that it predicts that tenses are much more well-behaved than they actually are. Among the difficulties are the fact that they display some interpretive behavior that is difficult to square with the nuts-and-bolts pronominal view when it comes to their behavior in embedded clauses—especially so when they embed under attitude verbs. The aim in what follows will be to lay out a theory that expands on the nuts and bolts view so as to retain what is essential to it, but gives it the flexibility to account for the more recalcitrant data. So, I will not spend a lot of time explaining the motivating data, but it is worth getting the flavor of it.

Compare the sentences in (25)–(27), all containing a past or present tense embedded under a higher past tense.

- (25) John met a man who was walking.
- (26) John believed a man was walking around the office.
- (27) John thought that Leslie is pregnant.

The sentence (25) has several possible interpretations. The first is the simultaneous interpretation, where the event described by the verb in the main clause is located in the past, and the embedded clause is simultaneous with that event. In the second interpretation (the back-shifted interpretation), the meeting event is again in the past, but the event described by the verb in the embedded clause is in the past relative to the past meeting event (so, the meeting precedes the speech time, and the walking precedes the meeting). There is also an interpretation of (25) where the walking and the meeting are unordered, but both in the past. It would allow, for example, the walking to come after the meeting (provided both were in the past). This is perhaps a remote interpretation, but it is possible. Let's call this the future interpretation, since the embedded tense denotes a time which is in the future with respect to the one denoted by the higher tense. (Meeting occurs before walking which occurs before speech time).

When we turn to (26), though, we must acknowledge that there are both simultaneous and backshifted readings available, but not the future interpretation.³⁴

³⁴ One might suspect that embedded tenses can be constrained by the higher tense embedding them, the matrix-level tenses then being anchored to the speech time. Such is the nature of the proposal by Enç (1987). However, the example cited by Abusch (1997) shows that this proposal will not work:

- (i) John decided a week ago that in ten days at breakfast he would say to his mother that they were having their last meal together.

The availability of something like the future interpretation is predicted by the pronominal view—its absence in special cases like in (26) needs explaining, though. Why should we get both the simultaneous and back-shifted interpretations, but not the future interpretation when it comes to attitude verbs?

Next, consider (27), which has a present-under-past configuration. Present-under-past sentences have a particular interpretation, where the embedded event is interpreted as neither wholly past nor wholly present. That is, for (27) to be felicitous, it has to be the case that John's thinking about Leslie's putative pregnancy is in the past, and yet that the putative pregnancy persists to the present moment. This is called the double-access interpretation. It is obligatory with a sentence like (27); were the putative pregnancy merely simultaneous with the thinking, then an utterance of John thought that Leslie was pregnant would be more appropriate—adverting to the simultaneous reading of a past-under-past construction. Again, the nuts-and-bolts pronominal theory by itself does not provide the resources to explain how one might derive such an interpretation.

11. The Temporal *de re*

Abusch (1997) argues that most of the central facts about embedded tenses can be explained if the tense system of natural language has a mechanism for *de re* attitudes towards times.³⁵ What is crucial about this theory is that it presents only a slight departure from the nuts-and-bolts version of the pronominal view of tense. But it is this departure that will allow us to defend desire temporalism. The aim of this section, then, is to explain this mechanism, and to argue that it underwrites a kind of temporalism which I will use to develop the insights from Sections 5 and 6, but within the pronominal theory of tense.

Essentially, Abusch's proposal is to combine what I called the nuts and bolts theory with an account of *de re* attitude ascriptions (from Cresswell, von Stechow, 1982, which draws heavily on the famous analysis in Lewis, 1979). According to Lewis (1979), attitudes are not relations between subjects and propositions construed as sets of worlds. They are, rather, relations between subjects and sets of centered worlds, where a centered world is an ordered pair of a world and a center. The center is perhaps best thought of as a time slice of an individual, and represents (at least) the spatiotemporal position of the individual in the world. The idea is that sets of centered worlds are sets of world-bound objects. As such, these sets denote properties. If the traditional account of belief in terms of propositions has it that one's attitude is characterized by a set of worlds—the worlds that are live possibilities for the way the world is, as far as one believes, the property-based view advocated by Lewis has it that one's *de se*

The issue with (i) is that the having of the last meal together is located a time later than speech time. Evidently, we need some kind of constraint to rule out a future interpretation of (26), but not too strong a constraint that would fail to allow (i).

³⁵ Many, but not all, of the facts. More on this shortly.

attitude is characterized by the objects that, for all one knows, one might be. These are one's doxastic alternatives. With this characterization of belief, *de dicto* belief comes out as a special case of the *de se*. It is one where, in the set of doxastic alternatives, the choice of center is idle—for any w among the doxastic alternatives, any of the centers in w is among the doxastic alternatives.³⁶

In this centered-worlds/ property-based account of the attitudes, belief *de re* also comes out as a special case of the *de se*, in the following sense. Belief *de re* is simply a centered-worlds based belief which includes a particular kind of acquaintance relation to the relevant object. (This suggestion about acquaintance relations originates with Kaplan 1968). In that case, we can characterize belief *de re* in the following way (cf. Ninan, 2012 for this characterization).

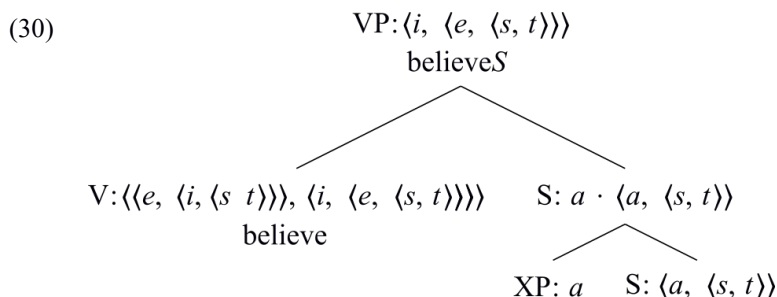
- (28) A subject x believes, at t in w , that y is F , relative to acquaintance relation R iff:
- a. x bears R uniquely to y at t in w , and
 - b. x believes *de se* (at t in w) that the thing to which he bears R is F .

Getting an interpretation like (28) from an attitude report is not completely straight-forward, however. Consider (29) construed *de re*:

- (29) Ralph believed Ortcutt was a spy.

In (29), it is not simply a matter of the verb *believe* taking a proposition as an argument. This would not give us the interpretation in (28). Rather, the proposal is that *believe* takes two arguments: (i) a property argument (a set of centered worlds, as Lewis suggests) and (ii) a *res*-argument (the *res* of which the belief holds). This structure (*believe* and the two arguments) then combines with another individual argument—the subject of the attitude. By itself, this still will not give us the interpretation in (28). We need to interpret *believe* and its two arguments (the *res*-argument, and the property-argument) a particular kind of way. In the Abusch/Cresswell and von Stechow proposal, there is a node in the semantic derivation of the sentence at which the property argument combines with an NP of the *res* (in this case, *Ortcutt*) to yield a kind of structured proposition composed out of the pair of the NP and the property. We can generalize this structure to the schema in (30):

³⁶ This point is made in Cresswell and von Stechow's (1982) and subsequently by Egan (2006), who calls such sets of worlds "boringly centered".



The semantic type of the VP node ($\langle i, \langle e, \langle s, t \rangle \rangle \rangle$, at the top of (30)) should look familiar: it is the same type as in the example of *cry* given earlier in (24). The type $\langle e, \langle i, \langle s, t \rangle \rangle \rangle$ is the type of a centered worlds property—a function from individuals (type e) and intervals (type i) to a function from worlds to truth values. This means the attitude verb *believe* takes a property and yields the typical VP type as a value. But the sister node to *believe* is not a centered world. The dot notation indicates a product type of a pair of an item of type a and a property of type $\langle a, \langle s, t \rangle \rangle$. Now, a is not actually a type, but a variable ranging over types. So, for a sentence like (29) where the *res* is an entity, the type in question is e and our product type on the S-node becomes $e \cdot \langle e, \langle s, t \rangle \rangle$; a pair of an entity and a property. On top of this, the normal semantic value of the *res* is not actually contributed to the interpretation, but instead, its place is taken by an acquaintance relation that picks out the thing denoted by it. This is the source of the R in (28).

Before looking at the case involving tense, let's walk through the interpretation of the standard, objectual *de re* as in (29) to illustrate. Going by the schema in (30), when the NP *Orcutt* in (29) composes with *was a spy*, we get a structured proposition composed of the pair of *Orcutt* and the property *was a spy*—something like $\langle \text{Orcutt}, \lambda x.x \text{ was a spy} \rangle$. When this structured proposition composes with the verb *believe*, the NP *Orcutt* contributes not its normal semantic value, but instead another property, which serves as a suitable acquaintance relation Ralph has to *Orcutt*, like *the guy I saw sneaking around the beach*. You may notice, though, that according to the schema in (30), *believe* wants an argument of type $\langle e, \langle i, \langle s, t \rangle \rangle \rangle$, not of type $e \cdot \langle e, \langle s, t \rangle \rangle$, which is the type of the structured proposition. The way to make *believe* compose with the structured proposition is via a special interpretation rule, which takes the structured proposition (with R in place of *Orcutt*) and inserts a definite operator (like “the”) to scope over the structured proposition before composing with *believe*.

Since this operator is a kind of generalized quantifier, it can compose with two sets—the set of things which are R (if R is in fact a suitable acquaintance relation, the set will include only a unique member), and the set of things satisfying the property (in this case, *was a spy*). Interpreted in this way, with the definite operator, this is now a centered-worlds proposition and can compose with *believe*. Moreover, we now see how we can get an interpretation like (28) from

a natural language attitude ascription like (29).³⁷ Abusch’s point is this: we can do this for times just as for entities—so for the temporal *de re*, we get the product type $i \cdot \langle i, \langle s, t \rangle \rangle$ (remember: i is the type for intervals of time). That is how we get the temporal *de re*.

Let us take a quick look at the temporal case and see how far the temporal *de re* goes to explain some of the data in Section 10. Consider a past-under-past sentence like (31):

(31) Mary believed it was raining.

We can get the simultaneous reading with a Logical Form like (32).

(32) Mary past_2 believed [past_2] λt_0 [it t_0 be raining].

In (32), the lower past is co-indexed with the higher past. What we can have here is an instance of the lower past being anaphoric on the higher past. This kind of LF, on Abusch’s account, has a particular interpretation. She notes that the lower past is actually in an extensional position, outside the attitude context.³⁸ So the relevant time is the one in the real world, as it were (in this case, the same time at which the attitude takes place, since the embedded past is co-indexed with the higher past), and the complement of the attitude verb is $\langle \text{past}_2, \lambda t_0. \text{it } t_0 \text{ be raining} \rangle$. The R contributed to the semantic composition is a salient acquaintance relation that Mary had to the time $g(2)$. Since we are talking here of the simultaneous reading of (31), it is a simple matter what such an acquaintance relation might be—it is the internal *now* of the attitude holder at that time. We can think of this time as the evaluation time of the belief, since the belief’s truth or falsity will hinge on whether the content of her belief is true or false with respect to that time. *Of that time*, Mary’s belief has a temporal content to the effect that it is raining.

For the backshifted reading of (31), we simply choose another index for the lower past which is not anaphorically related to the higher past:

(33) Mary past_2 believed [past_3] λt_0 [it t_0 be raining].

³⁷ There is more one could say about this account—for example, that it allows for attitude ascriptions in so-called “double vision” cases, so that we consistently say both that “Ralph believed Orcutt was a spy” and that “Ralph believed Orcutt was not a spy”, provided each ascription is relative to a different R . Or, that there is a debate about whether the kind of recipe for *de re* interpretation described here runs into problems with counterfactual attitudes (cf., e.g., Ninan, 2012; Pearson, 2018; Yanovich, 2011). I set these aside, as they will not matter for the purposes of our argument.

³⁸ In order for this to be the case, the lower tense node actually needs to undergo a seemingly sui-generis kind of movement, which Heim (1994) called *res*-movement. This kind of movement is controversial, and there are some attempts to have the benefits of a Cresswell and von Stechow and Abusch style *de re* semantics without *res*-movement. Cf., e.g., the Concept Generator theory of Percus and Sauerland (2003).

The reference of past_3 is anaphoric to another time in the preceding discourse, or to another contextually salient time, but the interpretation is calculated in much the same way as before.

So much for the simultaneous and back-shifted readings. What explains the lack of the future reading? This turns out to require additional machinery to explain—nothing in the interpretive machinery so far would rule out the time denoted by past_3 in (33) from being later than past_2 . The unavailability of the future interpretation in the past-under-past configuration is an instance of what Abusch calls the upper limit phenomenon—that the local time of the attitude is the “upper limit” for the denotation of tenses in the intensional position (e.g., embedded under attitude verbs). She considers, but ultimately rejects an acquaintance relation-based explanation of this phenomenon. The acquaintance relation-based constraint is that having an attitude about a time later than the local now of the attitude amounts to requiring an acquaintance relation to a future time. And, the story goes, we cannot be acquainted with a future time—there is no proper acquaintance relation that would ground this interpretation.

There is something intuitive about such an explanation, but Abusch ultimately discards it as empirically unsupported.³⁹ What she posits instead is the Upper Limit Constraint—a constraint which says that the denotation of the embedded tense cannot be later than the denotation of the higher tense. A tense feature transmission mechanism enforces this constraint. Finally, explaining the peculiar double-access interpretation of present-under-past sentences like (27) appeals both to acquaintance relations and to the Upper Limit Constraint. I will not explain the mechanics of obtaining these interpretations, since we already have the details, we need for our defense of desire temporalism.

What I want to point out is the following: with Abusch’s theory we see an implementation of the pronominal theory of tense that accounts for a number of the facts of tense in natural language (well, in English, at least). Two observations are important for our purposes. First, we see that it is not the case that the pronominal theory of tense commits one to the idea that content is eternal. The whole mechanism of the temporal *de re* is dedicated to picking out a time, and then describing an attitude which the subject of the ascription holds of that time. It is fairly natural to think of this as describing a kind of temporal content. Second, think of the relation between the temporal *res* and the content thus described. If it is a belief being described, we would evaluate the belief as true if

³⁹ It is examples like the following (due to Andrea Bonomi) causes her to rethink the acquaintance relation-based explanation.

- i. Leo₁ will go to Rome on the day of Lea₂’s dissertation.
- ii. Lia₃ believes [that she₃ will go to Rome with him₁ then].

An *de re* interpretation of the second sentence in (i) is possible (imagine “then” as being anaphoric on the day of Lea’s dissertation, but Lia knows only of her travel date and nothing of Lea’s dissertation), even though her going to Rome is after the local evaluation time of the belief.

the content described held at the time provided by the *res* time. This is just the relationship of content to the circumstance of evaluation described in Section 5. We have not said anything about temporal adverbials in this section, and it turns out that integrating Abusch's proposal with temporal adverbials is a non-trivial matter (cf. von Stechow, 1995a; 1995b). But if we abstract away from the compositional implementation, we can see a way for the adverbials to modify an embedded clause in a way that corroborates Brogaard's proposal about composite tense operators. What we need is for the adverbial to modify the temporal *res*, as opposed to the embedded verb. So, rather than adverbial modification occurring as supposed by King (cf. (15) from Section 6), we need another alternative, where (34a) gets the LF in (34b).

- (34) a. Mary believed it was raining at midnight.
 b. Mary past_2 believed $[[\text{past}_2] [\text{at midnight } t_2] \lambda t_0 [\text{it } t_0 \text{ was raining}]]$.

Given the schema in (30), we would expect the sister of the node with *believe* to be the structured proposition $\langle \text{past}_2 \ \& \ \text{at midnight } (t_2), \lambda t_0. \text{it } t_0 \text{ be raining} \rangle$. In line with our previous remarks, the interpretation such an LF would receive is such that Mary's doxastic alternatives are those where her belief is the temporal $\lambda t. \text{that it rains at } t$, evaluated relative to $t = g(2)$ provided she have some suitable R to this time. (Having this R does not necessarily involve her having any belief about the time of the rain, other than that it was her internal now when she had the belief). What we see in this case, is the temporal *res* constraining the circumstance of evaluation for the attitude, and the adverbial modifying the temporal *res*. This provides us with an important proof of concept for the proposal made in Section 5 and shows us that we can get a good part of what Brogaard wanted to achieve with her composite tense operators (Section 6), but within the pronominal theory. Whereas Brogaard's proposal was about the nature of semantic content, the present proposal concerns how semantics conspires to describe attitude content. The significance of the present proposal is that attitude content can be temporal even if the semantic content of sentences in context turns out to be eternal.

12. Desire Ascriptions and the Temporal *de re*

Even with the encouraging outcome of the previous section, we have not explicitly defended desire temporalism from the challenge posed by temporal adverbials. The examples discussed in relation to embedded tenses all had to do with embedding under verbs of belief and not verbs of desire, so we have not said anything about the desire ascriptions that seemed problematic for desire temporalism. But it should be clear by now how the defense of desire temporalism will go. Namely, I will argue this: the examples that seemed problematic for desire temporalism are actually instances of the temporal *de re*. Even if the adverbials denote a time, the ascriptions do still describe a temporal content. This is

because the time specified by the adverbial is not part of the attitude content, but instead modifies the temporal *res*.

I take it the last section made reasonably clear how the temporal *de re* describes a temporal attitude content with respect a specified time, and how this specified time serves as a kind of circumstance of evaluation in the way described earlier in the paper. But to advance the claim in a way that makes a defense of desire temporalism plausible, we need to address a few loose ends. That will be the focus of this section. To that end, I will focus on desire ascriptions with *want* to illustrate. Doing so raises the question of whether the claim generalizes to other desiderative verbs and to other languages, but this is a question that will have to be addressed at a future time. Suffice it for now to say that this allows us to deal with the supposedly problematic examples posed in Section 4.

On to the loose ends...

What tense? The examples of the temporal *de re* we saw earlier involved a tense pronoun being interpreted in an extensional position under the matrix tense. In those cases, it was the tense that denoted the temporal *res*. It is not clear there is any tense in the embedded clauses of the kinds of desire ascriptions we have been considering. If not, then what denotes the temporal *res* in the relevant desire ascriptions?

A natural response to this question is would be to say that when there is no temporal adverbial, then there is no temporal *de re* interpretation possible. With the adverbial, we do get the temporal *de re*. Taking some earlier examples, namely (5c) and (5d), we can illustrate what I mean by comparing the proposed LFs of these sentences with and without the relevant adverbials in (35)–(38).

- (35) a. Jill wants to attend the concert.
 b. Jill₃ pres₁ want λt_0 [PRO₃ t_0 to attend the concert].
- (36) a. Jill wants to attend the concert on July 31, 2023 at 8:30 in the evening.
 b. Jill₃ pres₁ want [on t_2 July 31, 2023 at 8:30 in the evening] λt_0 [PRO₃ t_0 to attend the concert].
- (37) a. Jill wants Joe to win the election.
 b. Jill pres₂ want λt_0 [Joe t_0 to win the election].
- (38) a. Jill wants Joe to win the election on election day.
 b. John pres₁ want [on t_2 election day] λt_0 [Joe t_0 to win]

As you can see from the proposed LFs, there is nothing in (35) or (36) to serve as the temporal *res*, whereas while in (36) and (38), the adverbial denotes a time which can serve as the temporal *res*.

No upper limit? The phenomenon whereby tenses embedded in certain environments (like under attitude verbs) will not denote times later than the local now of the attitude is the upper limit phenomenon. It is what we observe when we note that (26) lacks a future interpretation. For *believe*, the local evaluation

time of the attitude is simply the time the time of the belief, so the embedded tense could not denote a time later than the belief time.

One might worry that the upper limit phenomenon and Abusch's explanation of it—the Upper Limit Constraint—may cause problems for the proposal that there is a temporal *de re* interpretation of these desire ascriptions. But, looking now at (36) and (38), the complements are future-oriented with respect to the local now of the attitude. Is this counter to the upper limit phenomenon? Does the proposal then contravene the Upper Limit Constraint?

It turns out that the worry is easily addressed. These attitude ascriptions do have the kind of future interpretation that (26) lacks, but the proposal still sits quite nicely with Abusch's Upper Limit Constraint. Abusch did indeed first attempt an acquaintance relation-based explanation of the upper limit phenomenon, which rules out future interpretations of embedded tenses under attitude verbs due to our putative inability to have an acquaintance relation to a future time not. If this explanation were correct, it would indeed mean that our claim of the temporal *de re* in desire ascriptions could be sustained. But while this explanation may be tempting, it is not correct, as we saw in Footnote 39. The Upper Limit Constraint Abusch winds up adopting puts a constraint on the interpretation of tenses (so, the interpretation of present and past). In (36) and (38), there is reference to a time later than the local now of the attitude, but it is introduced not via a tense, but via the adverbial, so there is no problem here.⁴⁰

All of this being said, the linchpin in the account is the kind of structured proposition approach to *de re* semantics proposed by Cresswell and von Stechow (1982) and applied to tense by Abusch (1997). This approach encourages a particular conception of how LFs of natural language sentences map onto descriptions of attitude contents. In the temporal domain we are considering, if Jill wants Joe to win the election, as (37) would have it, the attitude verb relates Jill to a temporal content. In the case of (38), where Jill wants Joe to win the election on election day, the attitude verb relates Jill to the ordered pair (on election day(t_2), λt_0 . Joe t_0 to win), with the second member of the ordered pair describing a temporal content, and the first member modifying the relevant circumstances relative to which the content is to be assessed, if the desire is to be satisfied.

13. Concluding Thoughts

We have covered a lot of ground, so here is a final recap. I started by introducing and explaining desire temporalism. Next, I discussed an apparent difficulty for the view. In a nutshell, it seemed that desire temporalism may be plausible when considering desire ascriptions without any embedded temporal expres-

⁴⁰ Additionally, the auxiliaries *will/would* extend the evaluation time of their complements into the future, so it is consistent with the Upper Limit Constraint for reference to the future to be accomplished in other ways, provided it is not simply via the interpretation of a tense node.

sions, but once one considered ascriptions with temporal adverbials, it became hard to see how the view could be sustained, especially if we took some of these adverbial expressions as themselves denoting times. I suggested that we could preserve desire temporalism if instead we took the time denoted by the expression not as contributing to the content, but as modifying the circumstance of evaluation relative to which the content is assessed. I then considered Brogaard's proposal about composite tense operators as a way of making this idea more precise. The proposal was found promising, but ultimately not taken on in favor of the more popular approach of treating tenses as pronouns. But a new problem presented itself—the pronominal view is often taken to preclude any kind of temporalism.

Moving forward, I introduced the pronominal theory of tense in considerable detail, moving beyond what I called the “nuts-and-bolts” version of the theory to a more sophisticated version which includes a semantics for the temporal *de re*. This more sophisticated version gives us the resources to predict some of the behavior of embedded tense. However, the temporal *de re* also provided the resources for spelling out the proposal about circumstances of evaluation. With the temporal *de re*, the temporal *res* acts as a kind of circumstance of evaluation—we just allow the temporal adverbial to modify the *res*. It would seem that the temporal *de re* gives us the resources to produce a similar account to what Brogaard has in mind, though while still eschewing temporal operators for temporal pronouns. We then say that the apparently problematic desire ascriptions are in fact instances of the temporal *de re*.

There are several conclusions to draw from this. First of all, and most immediately, desire temporalism can be sustained in the face of these ascriptions with temporal adverbials. Secondly, we have shown that, contrary to what is sometimes argued, adopting the pronominal theory of tense does not commit one to eternalism. In fact, the pronominal theory of tense shows how language provides the resources for accommodating forms of temporalism about attitude content even if one grants that the semantic content of sentences in context is eternal.⁴¹ If this is right, then the operator vs. pronoun debate turns out to be a bit of a red herring, at least when it comes to the temporalism and eternalism debate. Far from the pronominal view favoring eternalism, it provides the means for articulating a kind of temporalism, when it comes to ascriptions of attitudes.

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⁴¹ I am happy to grant this claim about semantic content, but perhaps we do not have to (cf. Ninan, 2010 for reasons why not).

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