TRANSIENT TRUTHS

An Essay in the Metaphysics of Propositions

BERIT BROGAARD

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Published by Oxford University Press, Inc.
198 Madison Avenue, New York, New York 10016

www.oup.com

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Library of Congress Cataloging-in-Publication Data
Brogaard, Berit.
Transient truths : an essay in the metaphysics of propositions / Berit Brogaard.
p. cm.
Includes bibliographical references (p.) and index.
ISBN 978-0-19-979690-8 (alk. paper)
1. Language and languages—Philosophy. 2. Semantics. I. Title.
P106.B733 2012
121′.68—dc23 2011029599

1 3 5 7 9 8 6 4 2

Printed in the United States of America
on acid-free paper

"The only reason for time is so that everything doesn't happen at once"

—Albert Einstein

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ACKNOWLEDGMENTS

Many people have contributed in one way or another to the life of this book. For personal enrichment, I am grateful to my lovely and beautiful daughter Rebecca and the rest of my Danish family and my close friends. For academic input, I am grateful to Mike Almeida, Kent Bach, Matt Bell, David J. Chalmers, Jonathan Cohen, Jeff Dauer, David Dowty, Mürvet Enç, Delia Graff Fara, Kit Fine, G.W. Fitch, John Gabriel, John Hawthorne, Ernie Lepore, Peter Ludlow, Jeff C. King, John MacFarlane, Dan Marshall, Peter Ohlin, Adam Pautz, François Recanati, Nathan Salmon, Jonathan Schaffer, Barry Schein, Susanna Schellenberg, Scott Soames, Barry Smith, Declan Smithies, Ted Sider, Susanna Siegel, Robert Stalnaker, Jason Stanley, Jim Stone, Ken Taylor, Michael Tye, Alan White, Steve Yablo, and two readers for Oxford University Press. I am particularly indebted to David J. Chalmers for his continual feedback, encouragement, and support throughout the process of writing this book before, during, and after my postdoctoral research position at the ANU under his supervision. I also owe special thanks to my uncle Jørgen Dalberg-Larsen and my Ph.D. supervisor Barry Smith for inspiring me to follow in their footsteps as philosophers and for teaching me not to give up when the writing gets tough.

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INTRODUCTION

Arthur Prior once said,

> I don't know how it is with [you], but half the time I personally have forgotten what the date *is*, and have to look it up or ask somebody when I need it for writing cheques, etc; yet even in this perpetual dateless haze one somehow communicates, one makes oneself understood. (1959: 17)

Prior thought that often what we believe when we believe something is a proposition without a specific date, a proposition that can change its truth-value over time. If I believe that your blue sweater looks good on you, then what I believe is a proposition that may be true today but false tomorrow. The view that propositional contents of this kind are sometimes the objects of the attitudes or the entities expressed by our utterances is called 'temporalism.' And this is the position argued for in this book.

Frege familiarly argued that all propositions are eternal: 'I love your new sweater' does not express a complete thought without added time determination. Once we add a time determination (e.g., 'at 3 p.m. April 5, 2007 (CST)'), the proposition expressed is eternally true or false. As Frege puts it:

> It is of the essence of a thought to be non-temporal and non-spatial. In the case of the thought that 3 + 4 = 7 and the laws of nature there is hardly any need to support this statement. If it should turn out that the law of gravitation ceased to be true from a certain moment onwards, we should conclude that it was not true at all, and put ourselves out to discover a new law: the new one would differ in containing a condition which would be satisfied at one time but not at another. . . . If someone wished to cite, say, 'The total number of inhabitants of the German Empire is 52000000' as a counterexample to the timelessness of thoughts, I should reply: This sentence is not a complete expression of a thought at all, since it lacks a time-determination. If we add such a determination, for example 'at noon on 1 January 1897 by central European time', then the thought is either true, in which case it is always, or better, timelessly true, or it is false and in that case it is false without qualification. (1979: 135)

Since Frege, numerous authors have expressed their discontent with temporalism, including G. E. Moore (1962), Richard Cartwright (1966), Robert Stalnaker (1970), David Lewis (1980), Mark Richard (1981, 1982), Nathan Salmon (1986, 1989), Howard Wettstein (1991), G.W. Fitch (1998, 1999), Jason Stanley (1997a, 1997b, 2005a: chap. 7), and many, many more. G. E. Moore, for example, thinks that we never assert the same proposition on two distinct occasions because the time of speech goes into the proposition asserted by the sentence in question. As he puts it:

> As a general rule, whenever we use a past tense to express a proposition, the fact that we use it is a sign that the proposition expressed is *about* the time at which we use it; so that if I say twice over 'Caesar was murdered,' the proposition which I express on each occasion is a different one—the first being a proposition with regard to the earlier of the two times at which I use the words, to the effect that Caesar was murdered before *that* time, and the second a proposition with regard to the latter of the two, to the effect that he was murdered before *that* time. So much seems to me hardly open to question. (1962: 71)

Richard Cartwright makes essentially the same point about present-tensed sentences, adding that temporal propositions are not the sorts of things that we normally assert:

> Consider, for this purpose, the words 'It's raining'. These are words, in the uttering of which, people often (though not always) assert something. But of course *what* is asserted varies from one occasion of their utterance to another. A person who utters them one day does not (normally) make the same statement as one who utters them the next. (1966: 92)

The same sort of consideration is used by Robert Stalnaker to show, among other things, that propositions are eternal. Temporal contents are not the sort of things we assert or believe. Nor are they the sorts of things we seek or provide when we engage in the practice of asking and answering questions, nor are they the sorts of things that can be possible or probable. To cut a long story short, only eternal contents could possibly have independent philosophical interest:

> The independent interest in [eternal] propositions comes from the fact that they are the objects of illocutionary acts and propositional attitudes. A proposition is supposed to be the common content of statements, judgements, promises, wishes and wants, questions and answers, things that are possible or probable. (1970: 278)

David Lewis thinks Stalnaker's semantic theory violates compositionality, but he agrees with Stalnaker's point that only eternal contents could have independent interest and uses this to argue against Kaplan's temporally variable contents:

> I cannot complain against Kaplan, as I did against Stalnaker, that his so-called contents are not semantic values because they violate compositionality. But Kaplan *cannot plausibly claim*, as Stalnaker did, that his contents have an independent interest as suitable objects for propositional attitudes. (1980: 40, italics added)

Nathan Salmon is one with his predecessors. Propositions are pieces of information, he says, and it is an essential feature of pieces of information that they are eternal:

> Not just some; all information is eternal. The eternalness of information is central and fundamental to the very idea of a piece of information, and is part and parcel of a philosophically entrenched conception of information content. (1989: 342)

Howard Wettstein adds that, in his opinion, it is unrealistic to think that it is always the case that we could have made explicit what was left implicit in an utterance of a non-eternal sentence; nonetheless he thinks:

> We can still maintain a *version* of Frege's idea: propositions *are* complete and determinate, although not in the sense that Frege took them to be so. The fact that no eternal sentence counterpart can be found for an utterance of a given sentence is, I wish to argue, compatible with the fact that what was asserted is complete and determinate—complete and determinate in a way that guarantees, for example, *eternal possession of truth-value.* (1991: 25, italics added)

I think it is hardly an exaggeration to say that the Fregean view of propositions as entities that have their truth-values eternally has become orthodoxy in analytic philosophy. And it is this orthodoxy I wish to challenge in this book.

One of the issues at stake in the debate between eternalism and temporalism is whether temporal contents are propositions. Traditionally, propositions have been thought to play a number of distinct theoretical roles (Frege 1952):[1] Propositions are (i) the semantic values of truth-evaluable sentences, (ii) the objects of the attitudes (e.g., belief, doubt,

[1] I do not intend to defend a particular account of what propositions are. I simply stipulate that whatever (if anything) fills these roles is to be called a proposition. Cf. Hofweber (2005) and Schiffer (1987). However, for ease of exposition, I shall assume that propositions are structured entities—that is, complexes of objects, properties, and relations. See for example Salmon (1986) and Soames (1987). Alternative views of propositions include King's (1995) view of propositions

hope, wish, and so on), (iii) the objects of agreement and disagreement, (iv) what is transferred or shared when people communicate successfully, and (v) the contents intensional operators operate on (e.g., modal operators or tense operators).

The most important clauses here are the first two. Let's call views of propositions that require only that (i) and (ii) are satisfied, 'minimalist views of propositions.' Here I set out to show that temporal content satisfies the broader Fregean characterization. My argument strategy is as follows. In Chapter 1 I argue that temporal contents are truth-evaluable; in Chapter 2 I argue that temporal contents can be the objects of propositional attitudes; in Chapter 3 I argue that temporal contents can be the objects of agreement and disagreement and the contents that are passed on in successful communication; in Chapters 4 and 5 I argue that there are tense operators in English; in Chapter 6 I argue that the tense operators operate on temporal contents; in Chapter 7 I argue that both eternal and temporal contents satisfy the broader criterion for being a proposition; and finally, in Chapter 8 I offer a self-standing argument against the recently defended view that all propositions have their truth-values simpliciter.

Though eternalism has been the commonly received view since Frege, temporalism is not without its supporters. It has been defended by, among others, Aristotle (*Categories*), Arthur Prior (1957, 1967, 1968a, 1968b), Richard Montague (1973), David Kaplan (1989), and François Recanati (2007).[2] Prior thought that only temporalism can capture the meaning of ordinary tensed language. We do not usually say things like 'John is a firefighter at 3 p.m. April 5, 2005 (CST).' Nor is it clear that we mean them. As Prior points out, when one says 'Thank goodness that's over!' one does not mean: '"Thank goodness the date of the conclusion of that thing is Friday, June 15, 1954", even if it be said then' (1959: 17). What we mean is not something with a particular time in it.

That eternalism has become as popular as it is, is rather astounding. For eternalism comes with metaphysical baggage: It is available only to metaphysical eternalists, that is, to those who hold that past, present, and future are equally real. If (semantic) eternalism is true, then presentism is out of the loop.[3] A presentist might wish to hold that

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as complexes of semantic values that are held together by being related to sentential constituents that stand to each other in syntactic relations, and Bealer's (1998) view of propositions as sui generis abstract objects appropriately related to the semantic values of the constituents of the sentences that express them.

[2] Presentists also tend to be supporters of temporalism. According to many presentists, while the proposition *There are dinosaurs* once was true, it is no longer true. See for example Crisp (2003), Ludlow (1999), and Trenton Merricks (2007).

[3] It may be thought that presentism rules out temporalism. According to presentism, only present things exist. President Obama, iPhones and tigers exist; Bertrand Russell, Dinosaurs, and flying cars do not. As there is only one time (the present) if presentism is true, temporalism is false: It is not the case that propositions can have different truth-values at different times. However,

'Bush is president' means 'Bush is president at t^*,' where t^* is the time of speech, but she cannot take 'Bush is president at t^*' to be true when t^* is no longer present.[4]

Semantic eternalism also makes it difficult for metaphysical eternalists to articulate the commitments of their theory. As metaphysical eternalists think past and future objects are real, they want to say that while Socrates' time slice does not overlap the present moment, Socrates nonetheless exists. But the combination of semantic and metaphysical eternalism makes it difficult for the metaphysical eternalist to articulate these commitments. Take 'Socrates exists.' This sentence can express a false eternal proposition. This is the standard ordinary language reading. On this reading, the sentence expresses the obviously false proposition that Socrates exists at t^*, where t^* is the time of speech. Metaphysical eternalists furthermore hold that 'Socrates exists' also expresses a true eternal proposition. However, there is no obvious way to articulate this meaning in the language of the semantic eternalist. If they say that 'Socrates exists' expresses the proposition that Socrates exists simpliciter, then they run into trouble. For, Socrates exists simpliciter entails that Socrates exists at any time and hence that Socrates exists at t^*. But, as we have just seen, this latter proposition is obviously false. I argue that the commitments of metaphysical eternalism can be properly articulated only in the language of the temporalist.

The language of the temporalist allows that some sentences can be used to express eternal propositions. All present-tensed sentences lacking explicit time adverbials, and all past- and future-tensed sentences, I argue, can express, relative to a context of use, either a temporal proposition or an eternal proposition. As an illustration, consider 'There are wholly past objects.' On one natural reading, this sentence expresses an eternal proposition that may be true; on another, it expresses an obviously false temporal proposition. On the possibly true reading, the content expressed has a truth-value relative to a possible world; on the obviously false reading, the content expressed has a truth-value only relative to worlds and times.

I think this argument rests on a mistake. A presentist can truly say that there are propositions that are currently true but which were or will be false. I think that suffices as a statement of temporalism. Cappelen and Hawthorne (2009) call this view 'temporality.' They take that view to entail temporalism if metaphysical eternalism is true but not if presentism is true. But I think that is just a verbal dispute. If the presentist construes past and future times as ersatz times, then the presentist can hold that propositions can have different truth-values at different times.

[4] Note that the presentist cannot take propositions to be temporally complete in Frege's sense. For if t^* does not exist, then the proposition *Bush is president at* t^* does not exist. The presentist could, of course, construe times as abstract ersatz times. 'Bush is president at t^*'might then mean 'the maximally consistent set of propositions called t^* contains the proposition *Bush is president*.' See Markosian (2004) and Crisp (2007). See also Brogaard (forthcoming). But this view presupposes that there are temporally incomplete propositions (e.g., the proposition that Bush is president), and so presupposes temporalism.

The challenges for the semantic eternalist do not lie just within metaphysics. They also extend to philosophy of mind and philosophy of language. Eternalism has difficulties accounting for how belief information is stored and retained over time. We store information for the long term in the hippocampus, the brain's main memory center, and the cerebral cortex. But most of the time, we do not store information specifically linked to the time the belief was formed. For example, if I met Mary for the first time at time *t* and come to believe that Mary is a first-year college student, I do not store the information that Mary is a first-year college student at *t* for the long term. The information I store is that Mary *was* a first-year college student when I first met her. But the latter is a temporal proposition. It does not make reference to a specific time.

The eternalist may think she has a simple way of accounting for belief retention. The belief information stored in memory, she may say, is 'There is a time *t* and a time *t** such that *t* is identical to or prior to *t**, and *t** is whatever time is the present time, and Mary is a college student at *t*.' However, note that this piece of information is not eternally true or false. With respect to times during Mary's childhood, it is false. With respect to times after I met Mary, it is true. As the eternalist believes all propositions are eternally true or false, this reply is unavailable to her.

These kinds of considerations form the basis of my argument for the view that in the majority of cases the objects of belief are temporal contents.

Eternalism also has trouble accounting for how we pass on information and disagree across time. Eternalism takes all propositions to make reference to a specific time. But disagreements usually are not disagreements about specific times. Suppose during your visit, I look out of the window and witness a parking accident. I turn to you and say 'A blue Ford Escort just rear-ended your car.' You jump up from your chair, look out the window and reply: 'That's not my car. My car is parked over there.' Here your assertion is denying not what I said but what you took me to believe on the basis of what was said, namely that your car is the car that was just rear-ended. You are not asserting that the car that was just rear-ended is not your car at *t**, where *t** refers to the time at which you are speaking, as the eternalist would say. Your denial is meant to apply to both the time at which I was speaking and the time at which you are speaking.

The eternalist may insist she can account for disagreements over time by allowing eternal propositions to refer to long time intervals rather than specific times. But this sort of approach is highly problematic. First, there is a question of how the time intervals get specified. How long do they extend back in time or into the future? Second, there is a question of whether sentences express propositions that obtain during all times in the specified time interval or only during some of the times in the specified time interval. Regardless of what the answer is, the approach runs into trouble when things change during the specified interval. Consider the following discourse fragment:

YOU: Everyone who works for St. Louis Metropolitan Sewer District is entitled to health insurance. I work for St. Louis Metropolitan Sewer District. So I am entitled to health insurance.

BOSS: Well, the thing is . . . you no longer work for St. Louis Metropolitan Sewer District. You are fired.

In the envisaged scenario your boss desires to fire you on the basis of your assertion. Your assertion wasn't false when you made it. Yet if your assertion is that you work for St. Louis Metropolitan Sewer District at all times during a time interval that covers at least the time at which you and your boss are speaking, and this is what your boss denies, then what you are saying is false what and what your boss is saying is true. If your assertion is that you work for St. Louis Metropolitan Sewer District at some time during a time interval that covers at least the time at which you and your boss are speaking, and your boss denies this, then what you are saying is true and what he is saying is false. However, the correct outcome is that both you and your boss are saying something true.

The temporalist has no similar problem with respect to conversations that extend over time. Temporally neutral information can be passed back and forth between speakers and speakers can agree or disagree with it. At any time during the conversation the information can be evaluated for truth. This will ultimately determine who is right and who is wrong. These kinds of considerations form the basis for my core argument for the view that the objects of agreement and disagreement and what is passed on in conversations extended over time are temporal contents.

Temporal contents not only function as the objects of our propositional attitudes and the contents of our utterances. They are also the contents that intensional operators work on. Tense operators are a case in point. If tense operators operated on eternal content, then they would be semantically redundant. For example, the past tense operator 'It has been that' in 'It has been that John is a firefighter at 3 p.m. April 5, 2006 (CST)' is semantically redundant. It is redundant because 'John is a firefighter at 3 p.m. April 5, 2006 (CST)' expresses an eternal proposition. Since eternal propositions have the truth-values they have at any time, it makes no difference to their truth-values whether or not 'It has been that' is prefixed to them. So if tense operators operated on eternal contents, then they would be semantically redundant. But our everyday tense operators are not semantically redundant. So tense operators operate on temporal contents.

There are some who deny that there are tense operators in English. They argue that the assumption that there are tense operators in English is at odds with linguistic evidence. I develop the essentials for a Priorian tense logic that can withstand this line of argument. On this theory, the basic tense operators (e.g., 'it was the case that' and 'it will be the case that') combine with other temporal expressions to form composite tense operators. For example, 'it was the case that' and 'in 1995' may combine to form

the composite tense operator 'it was the case in 1995 that.' Similarly, 'it will be the case that' and 'tomorrow' may combine to form the composite tense operator 'it will be the case tomorrow that.' As we will see, a properly developed Priorian tense logic can account for the linguistic data typically set out against the temporalist. A properly developed Priorian tense logic also provides a better account of so-called Partee and double-access sentences as well as minimal extensions of English.

As mentioned, semantic eternalism rules out, not only that our utterances express temporal propositions, but also that our mental states can have temporal propositions as their content. As we will see, the strongest and also simplest case for temporalism, and against eternalism, lies in the philosophy of mind rather than in the philosophy of language. Here is a rough sketch of the argument.

Many conscious mental states have a phenomenal character (or conscious quality) that does not represent times. On a weak representationalist view of conscious mental states, the phenomenal character of a mental state is a supervenience basis for the state's content. Accordingly, there cannot be a change in the content without a corresponding change in the phenomenal character. So if the phenomenal character of a mental state does not discriminate among different times, neither does the content.

Sensory perceptual states, conscious desires, wishes and hopes, conscious perception-based beliefs and emotional states are good candidates to be states with a phenomenology that needn't represent times. For example, in the absence of a clock in the visual field, our visual phenomenology does not represent times. As I am sitting here at my desk without a clock within my visual field, nothing in my visual phenomenology represents that it is 12:07 p.m. rather than 1:07 p.m. Unlike colors and shapes and chairs and tables, times are not represented visually. If weak representationalism is true, then the content of my visual experience does not represent times. If, furthermore, the content of my visual experience is a proposition, then there are propositions that do not represent times and hence there are propositions that can have different truth-values at different times.

Of course, one could object here either that visual experiences are not propositional attitudes or that weak representationalism is false. I address these concerns in the last chapter. Even if perceptual experiences are not propositional attitudes, however, it is hardly plausible to hold that belief and desire states—the stereotypical propositional attitudes—do not have propositional contents. My occurrent desire to take a nap has propositional content. But the phenomenology of my desire to take a nap could be the same as it actually is, had it occurred 15 minutes later than it in fact did. So the phenomenology of desires need not discriminate among times. If the content of that desire supervenes on its phenomenology, then the propositional content of my desire to take a nap does not represent a specific time, and hence the propositional content of my desire can have different truth-values at different times. As temporalism says that there are propositions that have different truth-values at different times, temporalism is true.

The observations just made about the phenomenology of mental states will serve as the foundation of my main self-standing argument for temporalism. I think the reason semantic eternalists have overlooked this simple but forceful argument for temporalism is that they have been concerned primarily with the propositional content of utterances.

Unlike temporalists, most semantic eternalists reject an attractive big-picture view of propositional content. On the view I have in mind, there are two kinds of propositional content: content that is true simpliciter (or perhaps relative to a world), and content that is true relative to further parameters (e.g., a time). We can call the latter sort of content 'centered content,' because it is true relative to a so-called centered world, a world in which certain parameters are marked. The most-talked-about type of centered world is a world in which an individual and a time are marked. But any world that has a further marked parameter is a centered world. Because temporal propositions have truth-values only relative to worlds in which a time is marked, temporal propositions have centered content. They are not true or false simpliciter or relative to a world. They are true or false only relative to a centered world.

Both our utterances and our mental states can express propositions that are true simpliciter or true only relative to a world. For example, my utterance of the sentence "The wall in my living room at the present moment in this world is white" expresses a proposition that is true or false simpliciter. Without the reference to the world, the utterance expresses a proposition that is true or false relative to the actual world.

The temporalist and the eternalist agree that language can be used to express propositions of this kind. What they disagree about is whether any genuinely propositional content can be true or false only relative to a time. The temporalist says 'yes'. The eternalist says 'no'. Their dispute is thus part of a larger dispute about whether propositional content can be centered. This is not to say, of course, that semantic eternalists cannot hold that there are other kinds of centered content than the kind that lies at the heart of their dispute with the temporalist. They certainly can. There are other positions concerned with arguing that propositional content is centered. These include semantic relativism and non-indexical contextualism. I will look closer at what these positions have in common with temporalism in the last chapter.

On the big-picture view that encompasses temporalism, there are two kinds of propositional contents, because there are two ways of conceptualizing the world in language and thought. We can understand the world from a God's-eye point of view or from the point of view of subjects occupying the world.

On the contender to this view, there is only one legitimate way to represent the world, which is a way that is independent of the subjects who are having thoughts about or are talking about the world. This opponent view entails that a sharp distinction can be drawn between sensory perception, on the one hand, and belief and language, on the

other. Unlike sensory perception, language and belief somehow represent the world independently of the phenomenal consciousness of those doing the representation.

I deny this view. I hold that while we can represent the world in language and thought independently of our own position as subjects in space and time, we don't always represent it that way. In perception we don't. But we don't always represent the world independently of our own position when we talk about it either. If we have a dispute about whether you were in your office yesterday at 2 p.m., the dispute is about what happened yesterday at 2 p.m. Time is highly relevant to this dispute. But we can also engage in a dispute that has no bearing on time. If we are discussing whether John is pale, what time it is may be irrelevant to our dispute and need not figure in the contents of our utterances. Of course, we both know that we are talking about the color of John's skin at the time of the conversation, and the time of conversation in part determines the truth-value of the propositions we express, but whether it is 1:45 p.m. or 2:15 p.m. need not matter to our discussion and hence need not be represented by the content of what we are saying. Or so I will argue.

1

CHARACTERIZING TEMPORALISM

Sentences such as 'This tree is covered with green leaves at noon on 1 January 1897 by central European time,' which contain a time-referring constituent, make explicit reference to a time. But many of the sentences we utter fail to do that. The sentence 'This tree is covered with green leaves,' for example, lacks explicit time determination. Nonetheless, on the received view of propositions, going back to Frege, such sentences, when uttered at a particular time, express temporally complete propositions, or thoughts (*Gedanken*), as Frege called them. As Frege puts it:

> [A]re there thoughts which are true today but false in six months time? The thought, for example, that the tree is covered with green leaves, will surely be false in six months time. No, for it is not the same thought at all. *The words 'this tree is covered with green leaves' are not sufficient by themselves for the utterance; the time of utterance is involved as well.* Without the time-indication this gives we have no complete thought, i.e. no thought at all. Only a sentence supplemented by a time indication and complete in every respect expresses a thought. But this, if it is true, is true not only today or tomorrow but timelessly. (1968: 533, italics added)

When Frege says that the words 'This tree is covered with green leaves' are not sufficient for expressing a thought, he does not mean that only eternal sentences (e.g., 'The tallest tree in Frege's garden is covered with green leaves at noon on 1 January 1897 by central European time') can express propositions. Rather, he means that sentences without explicit time determination express a thought only when uttered at a particular time (Wettstein 1991: 22). If uttered at noon on 1 January 1897 by central European time, 'This tree is covered with green leaves' expresses the proposition that this tree is covered with green leaves at noon on 1 January 1897 by central European time.

Mark Richard (1981) calls the thesis that propositions are unable to change their truth-values over time 'eternalism' and the opposing view 'temporalism.' Temporalism is committed to the view that either some propositional attitudes have temporal propositions as their objects, or sentences that lack time adverbials (e.g., 'now,' 'when John was born,' 'at 2 p.m. July 6, 2005') express, relative to a context of use, temporal

propositions. Propositions of this sort may vary in truth-value over time. For example, the proposition expressed, relative to a context of use, by 'This tree is covered with green leaves' may be true in the summer but false in the winter.

It is this latter view that I wish to defend in this monograph. I wish to argue that there are contents that, in spite of being temporally neutral, satisfy the criteria for being propositions. I begin my defense by offering more precise formulations of temporalism and eternalism.

1.1. TIMES IN PROPOSITIONS vs. TIME NEUTRALITY

Following Richard (1981), let us call a proposition that may have different truth-values at different times a 'temporal proposition,'[1] and let us call a proposition that has its truth-value eternally an 'eternal proposition.' Eternalism then is the view that all propositions are eternal. The sentences 'John is a firefighter' and 'John is now a firefighter,' when uttered at a particular time, both make reference to a time, namely the time of speech.[2] Temporalism is the opposite of eternalism. It holds that some propositions are temporal. For example, 'John is a firefighter' expresses, relative to a context, the temporal proposition that John is a firefighter.

Note that temporalism is not committed to the view that all propositions are temporal. Such a view would most likely be false.[3] As Dean Zimmerman points out in the postscript to his 'Temporary Intrinsics and Presentism,' if I consult my calendar in order to answer questions about where I will be in the future, I might say:

(1) I am giving a talk in Alaska in July.

Relative to my current context of use (1) expresses an eternal proposition, and I am capable of believing it.[4] So the temporalist is committed to there being two kinds of propositions: eternal and temporal.

[1] I say 'may have different truth-values at different times,' because I don't want to say that 'John is lying down' expresses an eternal proposition merely because John died before he learned to sit. As I will argue in Chapter 7, whether a sentence expresses a temporal or an eternal proposition is ultimately a matter of speaker intentions.

[2] Or alternatively: an interval that overlaps the time of speech (Fitch 1999 and Salmon 2003). Thanks to David Chalmers here. I offer reasons for rejecting these alternatives in Chapters 2 and 3.

[3] See, however, Ludlow (1999, 2004). Ludlow here considers what he calls 'very serious tensism,' the view that 'every natural language predication is inherently tensed. There are no untensed predications—in particular, no time-indexed verbs/predications—in natural language'(2004: 23) If very serious tensism is correct, then evidently there are no eternal propositions.

[4] 'In July' is indexical. In one context it might mean 'At 7 p.m. on July 20, 2008 (EST),' in another 'at 1:45 p.m. on July 5, 2006 (PST).'

Past- and future-tensed sentences and present-tensed sentences lacking time adverbials (e.g., 'today,' 'tomorrow,' 'in two years,' 'in 1995,' 'when John arrived,' 'during World War II,' 'often,' and so on) typically, but not inevitably, express temporal propositions.[5] The sentence 'There are wholly past objects,' for example, does not normally express a temporal proposition in spite of the fact that it is in the present tense and does not contain any time adverbials.[6] I offer an explanation of why some sentences lacking time adverbials may still express eternal propositions in Chapter 7. Here I will be concerned primarily with the assumption that past- and future-tensed sentences and present-tensed sentences without time adverbials typically express, relative to a context of use, temporal propositions—propositions that can change their truth-values over time.

The question of whether propositions are eternal or temporal must be kept distinct from the question of whether sentences have the same semantic content at all contexts of use. As an example of a sentence whose content is invariant but whose truth-value varies with the circumstance of evaluation, consider:

(2) John is a firefighter at 3 p.m. April 5, 2006 (CST).

In spite of the fact that the content of (2) has different truth-values at different possible circumstances of evaluation, (2) has the same eternal content in all actual and merely possible contexts of use.[7] If John is a philosopher and has never been in any other profession, then the content of (2) is actually false, but it could have been true. Thus (2) invariantly expresses a content that determines a function from worlds to truth-values.

But consider now the sentence

(3) John is a firefighter.

This sentence may be taken to express the same temporal content relative to all contexts of use. If it expresses the same temporal content relative to all contexts, then the truth-value of this content will vary with the time of speech in much the same way that

[5] The sentence 'I turned off the stove at 3 p.m. April 5, 2006 (CST),' for example, expresses a proposition which was false before 3 p.m. April 5, 2006 but which may be true afterwards.

[6] The sentence 'There are wholly past objects' could be taken to express, relative to a context of use, an obviously false proposition. I return to this issue in Chapter 7. Some might object to my calling sentences like 'there are wholly past objects' and 'John is a firefighter at 1500 April 5 2006 (CST)' 'present-tensed sentences.' In Chapter 6 I argue that the present tense is redundant. For now, however, let 'present-tensed' be a technical term that applies to sentences whose copula or main verb phrase is grammatically in a present-tensed form (e.g., 'is' or 'is writing').

[7] I take it that the content or semantic value of an expression *determines* an intension, but for simplicity's sake, I shall for the most part use 'content' and 'intension' synonymously.

the truth-value of the content expressed by (2), relative to a context of use, varies with the world of speech.

Alternatively, (3) may be taken to express different contents relative to different contexts of use. If, for example, (3), when uttered at a particular time, makes reference to the time of speech, then (3) will express different contents in different contexts. If uttered at 3 p.m. April 5, 2002 (CST), it will express, relative to that context, the proposition that John is a firefighter at 3 p.m. April 5, 2002 (CST), and if uttered at 3 p.m. April 5, 2030 (CST), it will express, relative to that context, the proposition that John is a firefighter at 3 p.m. April 5, 2030 (CST).

It might be thought that eternalism automatically takes (3) to express different contents at different contexts of use, whereas temporalism ordinarily takes (3) to express the same content at any context of use. And this is correct given standard semantics. Given standard semantics and eternalism, (3) expresses, relative to context *c*, the proposition that John is a firefighter at t^*, where t^* is the time of *c*, and given standard semantics and temporalism, (3) expresses, relative to *c*, the temporal proposition that John is a firefighter. The former determines a function from worlds to truth-values, whereas the latter determines a function from <world, time> pairs to truth-values.[8]

There are other positions in logical space, however. On standard semantic theory, a context of use is a sequence of parameters, which, following David Kaplan (1989), include a speaker, an addressee, a world, a time, and a location.[9] For example, the sequence {Brit, Napoleon, the actual world, 3 p.m. Jan 15, 3267 (CST), Stockholm} is a context, even if the referent of 'I' never co-existed with Napoleon and never will be temporally located at 3 p.m. Jan 15, 3267 (CST). Kaplan's semantics thus allows contexts that are not real speech situations.[10] One reason to allow at least some contexts that are not real speech situations is that some sentences cannot be assigned a truth-value otherwise. Consider, for instance, 'I am not speaking now.' 'I am not speaking now' ought to be true relative to some (improper) contexts of use. But if all contexts are real speech situations, it couldn't be. To allow for the truth of sentences like 'I am not speaking now,' then, we need to allow for contexts that are not real speech situations. Not everyone agrees with Kaplan's formal notion of context (see for example Lewis

[8] By 'the proposition determines a function from worlds to truth-values' I just mean that the proposition has a truth-value only relative to a possible world. I am ignoring location.

[9] 'Demonstratives' was not published until 1989, but Kaplan presented an earlier version of it to the 1977 Pacific Division Meeting of the American Philosophical Association. And before that precursors of the paper had been in circulation since 1971. See Almog, Perry, and Wettstein (1989: v), and Lewis (1998: 44).

[10] Kaplan thought some of these contexts are irrelevant to natural language. For example, he considers 'I am here now' true in all contexts of utterance.

1998 who thinks contexts are real speech situations). However, in what follows I shall follow Kaplan in taking contexts to be sequences of parameters.

In standard semantics, the context of use plays two distinct roles: It fixes the semantic values of indexicals ('I,' 'now,' 'here,' and so on), and it determines a default circumstance of evaluation with respect to which the content expressed by the sentence relative to that context is evaluated for truth. Which parameters of the context go into the circumstance of evaluation will depend on which circumstance-shifting operators the language contains. Assuming that the language contains only modal operators and tense operators,[11] circumstances will be pairs of a world and a time.[12]

Circumstance-shifting operators shift the parameters of the circumstance of evaluation. The modal operator 'It is possible that,' for example, shifts the world feature of the circumstance of evaluation, and the tense operator 'It has been that' shifts the time feature of the circumstance of evaluation. In the case of 'It has been that there are dinosaurs,' for example, the tense operator' It has been that' maps the proposition *There are dinosaurs* to the true iff *There are dinosaurs* is true at a circumstance of evaluation that lies in the past of the default circumstance.

Given standard semantics, then, sentence truth depends exclusively on the context of use. A sentence, if it has a truth-value at all, has a truth-value relative to a context of use. But standard semantics has come under recent attack from relativist camps.[13] According to relativism, sentence truth is relative, not only to a context of use, but also to a context of assessment. A context of assessment is a context in which a sentence is evaluated for truth or falsehood. Since the context of use and the context of assessment can come apart in relativistic semantics, propositions do not have determinate truth-values relative to a circumstance of evaluation determined by the context of use. They have determinate truth-values only relative to a circumstance determined by the context of use and the context of assessment.[14] Given relativism, then, it is possible to take

[11] Tense operators and modal operators are sentential operators, that is, they are operators that take as input the intension, relative to a context of use, of the sentence it embeds, and yields an intension as output.

[12] Other possible parameters include a location parameter and a standard of precision parameter. I shall ignore these parameters in what follows. The assumption that there are tense operators in English has come under recent attack. See King (2003). I defend the assumption that there are tense operators in English against objections in Chapter 4.

[13] See for example MacFarlane (2003, 2005, 2007a, 2007b, 2008, unpublished manuscript); Kölbel (2002, 2003); Richard (2004); Lasersohn (2005); Egan, Hawthorne and Weatherson (2004); Egan (2007, 2009); Wright (2006); and Boghossian (2006). There are, of course, important differences between the kinds of relativism defended by these authors. For example, MacFarlane's semantics, but not Kölbel's, envisions a distinction between point of interpretation and point of assessment.

[14] I shall set aside relativistic theories that hold that there is no fact of the matter as to what a sentence expresses relative to a context of use. See Weatherson (2008).

sentences to express, relative to a context of use, a proposition that contains a particular time, and yet deny that the proposition expressed is eternally true or eternally false (it may have a different truth-value when evaluated at a later time).

This view is plausible, for example, for epistemic modals (Egan, Hawthorne and Weatherson 2004). Suppose I assert the following sentence on December 24, 1990:

(4) Fermat's Last Theorem might be false.

Since it is compatible with what I knew in 1990 that Fermat's Last Theorem (FLT) is false, it would seem that the proposition expressed by (4), relative to my 1990 context, is true. But if eternalism is true, then propositions do not change their truth-values across time. So we cannot reevaluate the proposition expressed by (4) at a later time and get a different result. If the proposition expressed by (4), relative to my 1990 context, was true back then, then it cannot later become false.

Within the framework of relativistic semantics, however, (4) may express a complete proposition that is true relative to my 1990 context of use and my 1990 context of assessment but false relative to my 1990 context of use and a later context of assessment. A relativist could, for example, hold that (4) expresses, relative to my 1990 context of use, the temporally complete proposition that it might be in 1990 that FLT is false, and yet deny that this proposition is eternal.[15]

I think relativism fails, not because it is semantically incoherent, but because the relevant evidence in its favor can be adequately explained on other grounds (see Brogaard 2008a, 2008b, Heck 2006). Here I shall simply assume, without argument, that non-relativistic semantics is correct. I compare relativism and temporalism in Chapter 8.

Given non-relativistic semantics, temporalism is committed to the following two theses:[16]

Content Invariance: Some sentences lacking time adverbials (e.g., 'John is a firefighter') express the same proposition at different times.

[15] I am here assuming that the modal operator 'it might be that' is in need of temporal completion ('it might be in 1990 that') but that the sentence 'FLT is false' is not. The thesis that epistemic modal operators are in need of temporal completion gains prima facie plausibility from the fact that evidence 'comes and goes.' So it might be in 1990 that FLT is false even if it must be in 2000 that it is true.

[16] It might seem perhaps that a presentist could accept Truth Variance without accepting Content Invariance. But this is not obviously so. She certainly cannot easily hold that all propositions are temporally complete in Frege's sense. If t^* does not exist, then there cannot be temporally complete propositions containing it.

Truth Variance: Some of our utterances have contents that have different truth-values at different times (e.g., that John is a firefighter).

Notice that I did not include a clause along the lines of 'All sentences lacking time adverbials (e.g., 'John is a firefighter') express, relative to a context of use, temporal propositions.' I did not include such a clause because not all sentences lacking time adverbials express, relative to context, temporal propositions. The sentence 'There are wholly past objects,' for example, does not usually do that. Nor did I include a clause along the lines of 'Some propositions are temporally incomplete'; for, as I am using the expression 'temporally incomplete,' it simply means that there is no time constituent in the proposition.[17] But eternalists could agree that some propositions are incomplete in this sense by adopting a less conventional theory of propositions, as in George Bealer's (1998) algebraic account.

Within the framework of standard semantics, eternalism must deny Context Invariance and Truth Variance. Eternalism is thus committed to the following two theses:

Content Variance: Sentences lacking time adverbials (e.g., 'John is a firefighter') express different propositions at temporally distinct contexts of use.
Truth Invariance: The contents of our utterances do not change their truth-values across time.

To get to eternalism from these two theses, we need to add clauses corresponding to conditions (ii)–(iv) outlined in the introduction. On a minimalist view of propositions, we must add a clause to the effect that the objects of propositional attitudes do not change their truth-values across time. So on a minimalist view of propositions, eternalism can be articulated as follows:

Eternalism
E1. *Content Variance*: Sentences lacking time adverbials express different propositions at temporally distinct contexts of use.
E2. *Truth Invariance*: The contents of utterances do not change their truth-values across time.
E3. *Propositional Attitudes*: The objects of propositional attitudes do not change their truth-values across time.

To get to temporalism from the two theses stated earlier we must add at least the clause that some of our propositional attitudes have temporal contents as their objects. On a minimalist view of propositions, temporalism can be stated as follows:

[17] Of course, in a different sense every proposition is complete. In this sense, a complete proposition just means a truth-evaluable proposition.

Temporalism

T1. *Content Invariance*: Some sentences lacking time adverbials express the same proposition at different times.

T2. *Truth Invariance*: Some of our utterances have contents that can change truth-values across time.

T3. *Propositional Attitudes*: Some of our propositional attitudes have contents that can change truth-values across time.

Given standard semantics and a minimal definition of a proposition as something that can serve as a content of our utterances and as an object of our propositional attitudes, (E1), (E2) and (E3) stand and fall together. So to show that temporalism is true it would suffice to show either that some of our utterances express temporal contents or that some of our propositional attitudes have temporal contents as their objects.

I will, however, present independent arguments for (T2) and (T3) as well as the claim that temporal contents satisfy the other three conditions on propositions outlined in the introduction.

1.2. TRUTH CONDITIONS

Though temporalism and eternalism differ in fundamental respects, they do not always assign different metalinguistic truth-conditions to tensed sentences. By 'metalinguistic truth conditions' I mean a principle for determining truth-values based on the *extension* of the expressions in the sentence relative to a context.[18] Consider, for instance:

(5) John is a firefighter.
(6) John was a firefighter.
(7) John will be a firefighter.

Even though the temporalist standardly takes the tenses to function semantically as intensional operators, the temporalist may formulate her truth-conditions metalinguistically in terms of quantification over times (just as we may formulate the metalinguistic truth-conditions for modal claims in terms of quantification over worlds). If the

[18] As MacFarlane (2009: note 6) points out, a number of different entities have been called 'truth-conditions,' including the proposition expressed by the sentence in question, and rules for determining truth-values, based on features of context or circumstance of evaluation. For that reason MacFarlane recommends that 'talk of 'truth-conditions' should be avoided at all costs' at least in certain kinds of discussion. However, I think it is helpful to look at the metalinguistic truth-conditions here. The analysis of the metalinguistic truth-conditions for a given sentence, so understood, is distinct from the analysis of its content.

temporalist allows for the existence of wholly past and wholly future objects, then this will be the natural way to go.[19] The temporalist will then assign the following metalinguistic truth-conditions to the sentences in (5)–(7):[20]

(5a) John is a firefighter at t^*.
(6a) $\exists t(t < t^* \,\&$ John is a firefighter at $t)$
(7a) $\exists t(t^* < t \,\&$ John is a firefighter at $t)$

where t^* is the time of speech, and '<' means 'is earlier than.' As shown, (5a) says that John is a firefighter at the time of speech, (6a) says that there is a time t such that t is earlier than t^*, and John is a firefighter at t, and (7a) says that there is a time t such that the time of speech is earlier than t, and John is a firefighter at t. These truth-conditions are also the truth-conditions the eternalist would assign to these sentences.

It is tempting to think, therefore, that it makes no difference to the metalinguistic truth-conditions of tensed sentences whether or not there are temporal propositions. But this temptation should be resisted. Whether propositions are treated as eternal or not makes no truth-conditional difference in the case of sentences like those in (5)–(7), but it does make a difference in propositional attitude contexts. Consider, for instance:

(8) Mary believed that John was a firefighter.

Sentence (8) can be read in two different ways according as the tense of the complement clause is treated as semantically vacuous or not. Given eternalism, (8) is assigned the following metalinguistic truth-conditions:[21]

(8Ea) $\exists t(t < t^* \,\&$ Mary believes at t that John is a firefighter at $t)$
(8Eb) $\exists t(t < t^* \,\&$ Mary believes at t that $\exists t'(t' < t \,\&$ John is a firefighter at $t'))$

where t^* is the time of speech. Here (8Ea) says that there is a time t such that t is earlier than the time of speech, and Mary believes at t that John is a firefighter at t. This is the

[19] A presentist could give metalinguistic truth-conditions along the same lines. She might, for example, treat them as a heuristic device, or she might treat the times quantified over as ersatz times. See Markosian (2004) and Crisp (2007). Non-serious presentism, on the other hand, is not a way out. Non-serious presentism holds that only present objects exist but rejects the thesis that objects can possess properties and stand in relations only at times at which they exist. See Hinchliff (1988).

[20] I am keeping the world parameter constant.

[21] A past tense morpheme that occurs immediately under another past tense morpheme is subject to (optional) deletion (Ogihara manuscript, Kusumoto 1999: chap. 1).

reading where the past tense is given a vacuous reading. The sentence in (8Eb) says that there is a time *t* such that *t* is earlier than the time of speech, and there is a time *t'* such that *t'* is earlier than *t*, and John is a firefighter at *t'*. Here the past tense is not vacuous.

Temporalism assigns different metalinguistic truth-conditions. Given temporalism, the past tense functions semantically as an intensional operator that shifts the time of speech to some time in the past. So on one reading, (8) is true relative to a context iff it is true at a past circumstance of evaluation that Mary stands in the belief relation to the temporal proposition that John is a firefighter. That is, (8) is true relative to a context iff there is a time *t* such that *t* is earlier than the time of speech *t** and at *t* Mary stands in the belief relation to the temporal proposition that John is a firefighter. On the other reading, (8) says that it was the case that Mary believes that it *was* the case that John is a firefighter. The latter is true iff there is a time *t* such that *t* is earlier than the time of speech *t** and at *t* Mary stands in the belief relation to the temporal proposition that John was a firefighter. So the temporalist assigns the following metalinguistic truth-conditions.

(8Ta) $\exists t(t < t^*$ & Mary believes at *t* that John is a firefighter)
(8Tb) $\exists t(t < t^*$ & Mary believes at *t* that John *was* a firefighter)

Sentence (8Ta) says that there is a time *t* such that *t* is earlier than the time of speech, and Mary believes at *t* that John is a firefighter, and (8Tb) says that there is a time *t* such that *t* is earlier than the time of speech, and Mary believes at *t* that John *was* a firefighter. Notice that (8) does not require for its truth that Mary believes at some past time *t* that John is a firefighter at *t* (on the one reading), or that Mary believes at some past time *t* that John is a firefighter at some time that lies in the past of *t* (on the other reading).

If the tenses in the metalinguistic truth-conditions for (8) are found to be undesirable, we can offer the following truth-conditions instead ('*w*' ranges over worlds, and @ is the actual world).[22]

- There is a past time *t* such that, for all worlds *w* compatible with what Mary believes at <@, *t*>, *John is a firefighter* is true at <*w*, *t*>.

[22] The benefits of treating 'S believes that' as an intensional (or strictly speaking, hyperintensional) operator will be set forth in Chapter 6. To avoid the implication that belief is closed under consequence, an additional clause is required on the right-hand side of the truth-condition (see Chalmers, forthcoming): '*S* believes that *p*' in *c* iff for all worlds *w* compatible with what *S* believes at the world of *c*, @, and the time of *c*, *t**, *p* is true at *w*, *t**, and '*p*' counts as an adequate description of what *S* believes at @ and *t** in *c*. The additional clause will for the most part be ignored.

- There is a past time *t* such that, for all worlds compatible with what Mary believes at <@, *t*>, there is a *t'* such that *t'* < *t* & *John is a firefighter* is true at <*w*, *t'*>.

The temporalist's metalinguistic truth-conditions will be different when the attitude verb is factive. Consider, for instance:

(9) Mary knew that John was a firefighter.

Given eternalism, an occurrence of (9) is true on the vacuous reading of the complement clause tense iff there is a past time *t* such that Mary knows at *t* that John is a firefighter at *t*. Given temporalism, an occurrence of (9) is true on the vacuous reading of the complement clause tense iff there is a past time *t* such that Mary knows at *t* that John is a firefighter. But since 'S knows that' is factive, Mary knows at *t* that John is a firefighter only if John is a firefighter at *t*.[23] So an occurrence of (9) is true only if there is a past time *t* such that at *t* Mary believes that John is a firefighter, and John is a firefighter at *t*.[24] Treating 'S believes that' as an intensional operator, we may formulate this as follows:

There is a past time *t* such that, for all worlds *w* compatible with what Mary believes at <@, *t*>, *John is a firefighter* is true at <*w*, *t*>, and *John is a firefighter* is true at <@, *t*>.

This shows that whether eternalism or temporalism is correct does make a truth-conditional difference. The difference lies in the truth-conditions assigned to sentences with a propositional attitude verb.

[23] A side remark: The temporal truth that Bob is exactly 10,000 days old is knowable, but it won't be in the future, for it won't be true in the future. What will be knowable in the future is the proposition that Bob was 10,000 days old. On a related note: It might seem that when the knowledge operator K is read as 'Someone at some time knows that' then Kp isn't factive. For it might seem that one may at some time know that p (namely at the time at which p is true), even if p is not now true. So it would seem that valid epistemic principles break down with tensed propositions. By way of reply, truth is relative to circumstances of evaluation. Given eternalism, circumstances are worlds. But given temporalism, circumstances are <world, time> pairs. Suppose 'K(Bob is typing)' means that someone at some time knows that Bob is typing. Given eternalism, this is true at a world only if Bob is typing (at a contextually determined time) at the given world. Given temporalism, it is true at a <world, time> pair only if Bob is typing at the given <world, time> pair. So it is not possible for the proposition expressed by 'K(Bob is typing)' to be true at a circumstance unless Bob is typing at that circumstance.

[24] I am not a proponent of the view that 'S knows that' is a decomposable mental state operator. Timothy Williamson (2000) has familiarly offered a number of reasons against this view. However, even if 'S knows that'is not a decomposable mental state operator, it may still be true that 'S knows p' entails 'S believes p.

1.3. TEMPORAL PROPOSITIONS ARE TRUTH-EVALUABLE

The temporalist attributes full proposition-status to temporal content. For example, despite not containing any implicit or explicit reference to a time, 'John is a firefighter' expresses, relative to a context, a proposition in the full sense. For temporal content to be a proposition in the full sense it must, among other things, be truth-evaluable. Temporalism thus refutes what we might call 'The Incompleteness Hypothesis'(Evans 1985: 349–50):

> The Incompleteness Hypothesis
> A tensed sentence lacking explicit or implicit reference to times is not truth-evaluable.

Supporters of the Incompleteness Hypothesis tend to appeal to a certain necessary truth about instantiated properties or relations (Cappelen and Lepore 2007).[25] Here is Mark Crimmins:

> 'It's raining' invokes the relation of raining. *What we know about rain* makes it obvious that this relation must have as arguments at least a time and a place. The present tense construction in 'It's raining' points indexically to the time of the statement. (1992: 17, italics added)

Crimmins' argument is this: It is a necessary truth about instantiated properties that they are instantiated at some time. If, for example, John instantiates the property of being a firefighter, then he instantiates it at some time. So no complete proposition can be expressed by 'John is a firefighter' unless a time is supplied.

There is a close analogy between this position and the position that no complete proposition can be expressed by sentences like 'Jane is ready' unless an act has been supplied. If Jane is ready, then there is something she is ready to do, for example, to leave, to eat, to go bed, or to go to school. Jane cannot simply be ready without being ready for something. So it would seem that no complete proposition is expressed by 'Jane is ready' unless an act has been supplied. Or so the argument goes.

The Incompleteness Hypothesis does not by itself yield the conclusion that tensed sentences *semantically* make implicit or explicit reference to a time when uttered at a particular time.[26] For it is open to argue that tensed sentences lacking an explicit reference to a

[25] Frege, of course, is one of the main supporters of the Incompleteness Hypothesis. See for example Evans (1985: 349f). Perry (1986, 1998), Carston (1988), and Taylor (2001) have argued for a parallel hypothesis concerning location. I turn to the parallel argument in Chapter 5.

[26] Cappelen and Lepore (2005) insist that there is no principled way of determining whether or not a sentence expresses a proposition or a propositional radical.

time express incomplete propositions that might be completed pragmatically by a speaker. 'John is a firefighter,' for example, might be taken to express the incomplete proposition *John is a firefighter*. Since the latter is incomplete, on the view under consideration, it is not the sort of entity that can be true or false. But the speaker of the sentence might supply the missing information, and so might succeed in pragmatically conveying a complete proposition. I do not know of anyone who has defended this view with respect to tensed sentences. But Kent Bach (1994, 2005) defends it with respect to sentences like 'Tipper is ready' and 'Al has finished.' On Bach's view, such sentences do not express complete propositions; they express only propositional radicals. For the sentences to be associated with complete propositions, the speaker must supply the missing information.

It is not hard to extend Bach's view to tensed sentences lacking a reference to a time. However, there is no need to turn to such radical measures, for the reasoning in support of the Incompleteness Hypothesis is highly suspect. As Herman Cappelen and Ernie Lepore (2005, 2007) have argued,[27] from the fact that a given event or state-of-affairs requires for its existence a particular property, it does not follow that the property is a constituent of a proposition concerning it. For example, from the fact that driving occurs at a certain speed, we should not want to conclude that the proposition expressed by 'John drove to Chicago last night' contains a certain speed. And from the fact that typewriting occurs at a certain pace, we should not want to conclude that the proposition expressed by 'Nora is typing a letter' contains a particular pace. Likewise, from the fact that John cannot instantiate the property of being a firefighter without instantiating it at some time, we should not want to conclude that there is a time in the proposition expressed by 'John is a firefighter.'

Furthermore, there is independent reason to be suspicious of the Incompleteness Hypothesis. Within the framework of Kaplanian semantics (1989), a sentence *S* is true at a context of use *c* iff the proposition *p* expressed by *S* at *c* is true at the default circumstance of evaluation determined by *c*. Circumstances of evaluation are pairs of a world and a time. So a proposition *p* is true at a given circumstance iff the proposition is true at the world and time of that circumstance. If, for example, 'John is a firefighter' is uttered at *t*, then 'John is a firefighter' is true at *t* iff the proposition that John is a firefighter is true at *t*. So within the framework of Kaplan semantics, no propositional time constituent is required in order to evaluate the temporally neutral proposition expressed, relative to a context, by 'John is a firefighter.'

A second argument for the Incompleteness Hypothesis, due to Stanley (2000: 415–17), is the so-called binding argument. It runs as follows. Sentences such as 'It is raining' and

[27] Cappelen and Lepore's critique is directed at the position that sentences such as 'it is raining' make implicit reference to a location. But the critique extends straightforwardly to the position that sentences lacking explicit time adverbials contain implicit time adverbials.

'John is hungry' can occur within the scope of quantified noun phrases that quantify over locations or times. But in such cases 'it is raining' and 'John is hungry' must be associated with an implicit indexical variable for the quantifier to bind. Consider, for instance:[28]

(10) Every time I visit John, he is hungry.

Intuitively, (10) says that for every time *t*, if I visit John at *t*, then John is hungry at *t*. Certainly, (10) does not mean that John is hungry at the time of speech *t** every time I visit him. So 'John is hungry' must make available an implicit time variable for the higher operator 'every time I visit John' to bind. (10), upon analysis, cashes out to 'for every time *t*, if I visit John at *t*, John is hungry at *t*.' But if 'John is hungry' contains a time variable when it is occurs within the scope of a higher operator, as in (10), then there is good reason to think that 'John is hungry' also contains a time variable when it does not occur within the scope of a higher operator. Or so the argument goes.

The argument has initiated quite a lot of recent debate.[29] Cappelen and Lepore (2002) argue that if (10) shows that 'John is hungry' is associated with an implicit time variable, then example (11) below should, by parity of reason, show that '2 + 2 = 4' is associated with an implicit time variable:

(11) Every time I visit Rutgers, 2 + 2 = 4.

Intuitively, (11) says that every time I visit Rutgers, 2 + 2 = 4 at that time. So if Stanley is right, then we should expect '2 + 2 = 4' to be associated with an implicit indexical variable that takes times as values. The structure of (10) should be 'for every time *t*, if I visit Rutgers at *t*, then 2 + 2 = 4 at *t*.' The higher operator 'every time I visit Rutgers' would bind a time variable in the sentence structure of '2 + 2 = 4'. But then when I utter '2 + 2 = 4', I should be saying that '2 + 2 = 4 as I am speaking'. But that is not what I am saying.

Stanley (2005b) replies that contrary to what Cappelen and Lepore seem to think, it is not the mere grammaticality of a sentence like (10) or (11) that indicates that there is

[28] The example that takes center stage in the Stanley/Cappelen/Lepore dispute is 'Everywhere Sally goes it is raining'(Stanley 2000: 415–17; Cappelen and Lepore 2002).

[29] See also Recanati (2004b: 106–7). Recanati thinks the binding argument, if correct, shows that 'eat' is associated with a hidden variable. For 'John is anorexic, but whenever his father cooks mushrooms, he eats' can be interpreted as meaning that John eats the mushrooms his father has cooked. However, Stanley (forthcoming) replies that this is not quite right, as it would not be appropriate to reply 'No he doesn't—he eats broccoli when his father cooks mushrooms.' Notice that if someone asserts 'every time I visit John, he is hungry,' then it would be slightly more appropriate to reply: 'No, he isn't—he is hungry two hours before you visit.' But if conditionals introduce situation variables into the sentence structure, as I suggest below, then this phenomenon is not surprising.

a hidden variable in its sentence structure. Rather, his argument rests on the premise that if the assumption that there is a hidden variable in the sentence structure results in an intuitive reading, then that indicates that the assumption is correct.

Stanley's reply indicates that if the binding phenomena can be explained on alternative grounds, then the alternative explanation would be worth taking seriously. Here is an alternative way to account for (10).

As David Lewis (1975), Irene Heim (1990), Kai von Fintel (1994), and Brogaard (2005, 2006a, 2007b and 2007d) have argued, general indicatives trigger quantification over cases (Lewis) or minimal situations (Heim; von Fintel; Brogaard). On the latter account, we can present the structure of (10) along the following lines: 'All minimal situations in which I am visiting John are part of a situation in which John is hungry.'[30]

An alternative approach is to treat 'every time' as a temporal operator (Salmon 1986). Example (10) is true, on this approach, iff the minimal proposition *John is hungry* is true at every circumstance at which it is also true that I visit John. I deal with the first two accounts in Chapter 4. My main point here is that the binding argument does not show that 'John is hungry' is associated with an implicit domain variable.

There is a superficially related argument for the Incompleteness Hypothesis. The argument runs as follows. Tensed sentences contain explicit or implicit referents to times, for if they did not, then they would be too easy to make true or too easy to make false. If, for example, my daughter utters the sentence 'John is a firefighter' at *t*, her utterance is not true in virtue of the fact that John is firefighter at some later time *t'*; rather, if it is true at all, it is true because John is a firefighter at *t*. Or as John Perry would put it: 'What my daughter said was true, because John was a firefighter at *t*. There were all sorts of times at which John wasn't a firefighter.'[31]

[30] Note that the assumption that there are hidden variables in the sentence structure of sentences such as 'quadratic equations never have more than two solutions' gives us no reason to conclude that 'there is a quadratic equation' is itself associated with a hidden variable.

[31] The real quote is: 'what my son said was true because it was raining in Palo Alto. There were all sorts of places where it wasn't raining'(1986: 38). I consider the analogy between locative and temporal expressions in further detail in Chapter 5. Perry distinguishes between indexicality and what he calls 'unarticulated constituents.' An indexical sentence contains an implicit indexical variable whose value is supplied by context. A sentence that expresses, relative to a context of use, a proposition with an unarticulated constituent, on the other hand, does not contain an implicit indexical variable. Context simply supplies the missing constituent. As Crimmins (1992: 16) puts it: 'An unarticulated constituent of the content of a statement is an item that is used by the semantics as a building block of the statement's content but is such that there is no (overt) expression in the sentence that supplies the object as its content. In a semantics that takes propositions to be structures containing objects and properties an unarticulated constituents is simply a propositional constituent that is not explicitly mentioned—it is not the content of any expression in the sentence.' This difference does not matter for our purposes, however, as we construe 'indexicality' broadly: any expression whose content is a function of context is indexical in our sense.

Or consider the following example from Barbara Partee (2004: 51). Suppose that after having left the house this morning with my colleague Susanna, I suddenly remember that I forgot to turn off the stove. 'Did you forget something?' Susanna asks, as I slam the brakes. I reply: 'I forgot to turn off the stove.' Obviously, I do not mean to say that I forgot to turn it off three weeks ago. My forgetfulness three weeks ago would not explain my current behavior. What I mean is that I forgot to turn off the stove before I left my house this morning. So it would seem that my utterance of 'I forgot to turn off the stove' makes implicit reference to a time. But, our opponent might continue, if past-tensed sentences make implicit reference to a time when uttered at a particular time, presumably present-tensed sentences do that as well.

By way of reply, standard Kaplan semantics renders the first example ineffectual. Given standard Kaplan semantics, propositions determine functions from circumstances of evaluation to truth-values, but circumstances of evaluation are pairs of a world and a time. So if my daughter uttered the sentence 'John is a firefighter' at *t*, then what she said at *t* is true iff it is true at the pair <the actual world @, *t*>. So my daughter said something that was true if John was a firefighter at *t*, but *t* is not a constituent of the proposition expressed at her context of use.

The second example is more convincing. It is true that we rarely use the past tense to talk about just any old time in the past. If I say 'I haven't had breakfast,' and you reply: 'Sure you have. I saw you eat a big blueberry muffin yesterday morning,' you would have missed the point of the conversation.

But it is not clear that this is an objection to temporalism. We might take an utterance of 'I haven't had breakfast' to be strictly false, unless the speaker has never had breakfast (Bach 1994). Alternatively (and this is the view I favor), we might grant that past-tensed sentences like 'I forgot to turn off the stove' and 'I haven't had breakfast,' when uttered at a particular time, make implicit reference to a time. 'I haven't had breakfast' might be used to say that I haven't had breakfast *today*, and 'I forgot to turn off the stove' might be used to say that I forgot to turn off the stove *then*, where 'then' goes proxy for a temporal locative (Ludlow 1999: chap. 8), or refers to a contextually determined time.

As Michael Bennett and Barbara Partee (2004: 64) remarked, when no time specification is present, 'the specified time is determinable from the previous discourse or extralinguistic features of the context of utterance.' This latter move is compatible with temporalism. For, as we will see in Chapter 4, a sentence like 'I forgot to turn off the stove then' may be analyzed as 'it was the case *then* that I forgot to turn off the stove,' where 'then' is either a pronoun of laziness that goes proxy for a time adverbial or a demonstrative that refers to a contextually determined time, and the embedded sentence is a temporal proposition. The supplied time "completes" the tense operator rather than the proposition operated on by the tense operator. The difference between

past- and present-tensed cases is simply that in present-tensed cases there is no tense operator in need of completion (more on that in Chapter 4).

1.4. SIGNPOST

Eternalism is the view that all propositions have their truth-value eternally, that is, they cannot have different truth-values at different times. Temporalism is the opposite view. It states that some propositions have different truth-values at different times. Given standard semantics, temporalism is committed to the view that sentences that express temporal propositions can have the same content relative to different contexts of utterance, whereas eternalism is committed to the view that sentences cannot have the same content relative to temporally distinct contexts of utterance. Eternalism and temporalism assign the same metalinguistic truth-conditions to tensed language that is not embedded under a propositional attitude verb but their metalinguistic truth-conditions come apart with respect to tensed language embedded under a propositional attitude verb. Importantly, temporalists take their propositions to be genuine truth-evaluable propositions, even if they do not make reference to a specific time. They thus reject the Incompleteness Hypothesis, which states that sentences that do not make implicit or explicit reference to a time are not truth-evaluable.

2

REPORTING BELIEF

Recall that, on a broader Fregean criterion for being a proposition, propositions are thought to play a wide number of distinct theoretical roles (Frege 1952): Propositions are (i) the semantic values of truth-evaluable sentences, (ii) the objects of the attitudes (e.g., belief, doubt, hope, wish, and so on), (iii) the objects of agreement and disagreement, (iv) what is transferred or shared when people communicate successfully, and (v) the contents operated on by intensional operators (e.g., 'It is possible that').

The claim that temporal contents may be the semantic values of sentences is relatively uncontroversial. Eternalists such as Robert Stalnaker (1970), David Lewis (1980), Mark Richard (1981, 1982), Nathan Salmon (1986), and Jason Stanley (1997a, 1997b) have all defended this claim. However, such eternalists prefer to reserve the term 'proposition' for eternal content.[1] The most controversial claims made by temporalists are (i) that individuals may stand in belief relations to temporal contents, (ii) that temporal contents can be the objects of agreement and disagreement, and (iii) that successful communication may involve temporal contents. I defend the first claim in this chapter and the second and third claims in the subsequent chapter.

2.1. THE CLASSIC OBJECTIONS

Mark Richard (1981) has leveled a potentially devastating argument against temporalism.[2] The argument runs as follows. There are obviously invalid arguments that would come out valid if temporalism were true. So temporalism is false. Here is one such apparently invalid argument (Richard 1981: 4):

(A)
Mary believed that Nixon was president.

[1] This is why their view does not qualify as temporalism. Temporalists think that there are *propositions* that have different truth-values at different times.

[2] The argument can also be found in Kneale and Kneale (1970: 235).

Mary still believes everything she once believed.
Therefore, Mary believes that Nixon *is* president.

According to Richard, 'this argument is not a valid argument in English. As speakers of English use sentences such as [premise 1] and [premise 2], [the conclusion] simply does not follow from them' (1981: 4). Or, as Salmon puts it, 'such an inference is an insult not only to Mary but also to the logic of English, as it is ordinarily spoken' (1989: 345). Yet, says Richard, the temporalist must regard (A) as valid. On behalf of the temporalist, Richard assigns the following truth-conditions to (A)

$\exists p \exists t(t < t^* \,\&\, p = [Pn] \,\&\, Bmpt)$
$\forall p(\exists t(t < t^* \,\&\, Bmpt) \rightarrow Bmpt^*)$
$\exists p(p = [Pn] \,\&\, Bmpt^*)$

where p ranges over propositions, '<' means 'is earlier than,' t^* is the time of speech, m is a constant that refers to Mary, and $[Pn]$ is the temporal proposition that Nixon is president. The first premise is true iff there is a time t such that t is earlier than the time of speech t^*, and a proposition p such that p is *Nixon is president* and at t Mary believes that p. The second premise is true iff for all propositions p, if there is a time t that is earlier than the time of speech t^* and Mary believes that p, then at the time of speech t^* Mary believes that p. The conclusion is true iff there is a proposition p such that p is *Nixon is president*, and at the time of speech t^* Mary believes that p. But this is valid. So the temporalist is committed to the validity of an apparently invalid argument.

The eternalist is not so committed. For the eternalist takes the first premise to mean that there is a time t such that t is earlier than the time of speech t^*, and Mary believes at t that Nixon is president *at t*. From this and the assumption that Mary still believes everything she once believed it does not follow that Mary believes at t^* that Nixon is present at t^*. In other words, the difference between the verdicts of temporalism and eternalism is that temporalism takes the objects of beliefs to be temporally neutral, whereas eternalism takes them to be temporally specified.

Here is a variation on Argument A which perhaps brings out the point more forcefully:

(B)
Mary believes everything John said.
John said that he was hungry.
Therefore, Mary believes that John is hungry.

The conclusion does not appear to follow from the premises. But if temporalism is right, then the second premise is true iff there is a time t such that t is earlier than the

time of speech t^*, and John says at t that he is hungry. So if Mary believes everything John said, then it should follow that she believes that John is hungry. Eternalism, on the other hand, takes the second premise to imply that John says at t that at t he is hungry, where t is a past time. This, together with the first premise, does not imply that Mary believes that at t^* John is hungry, where t^* is the time of speech.

Yet another variation on Richard's argument, due to Richard himself, is the following (1981: 4):

> (C)
> I, Mary, believed that Nixon was up to no good in the White House, and I still believe that.
> Therefore, I, Mary, believe that Nixon is up to no good in the White House.

Intuitively, (C) is invalid. Yet, says Richard, the temporalist is committed to its validity. For given temporalism, the premise is true iff there is a time t such that t is earlier than the time of speech t^* and Mary believes at t that Nixon is up to no good in the White House, and at t^* Mary still believes that Nixon is up to no good in the White House. From this it follows that at t^* Mary believes that Nixon is up to no good in the White House.

Eternalism, on the other hand, is not committed to this result. According to the eternalist, the objects of the attitudes are eternal. So the premise is true if and only if there is a time t such that t is earlier than the time of speech t^* and Mary believes at t that Nixon is up to no good in the White House at t, and at t^* Mary still believes that Nixon is up to no good in the White House at t.

If Arguments A, B and C are sound, they appear to dash all hope for the temporalist, for the temporalist, then, is committed to the validity of obviously invalid arguments.

Richard (1981: 6) considers some possible replies on behalf of the temporalist. First, the temporalist might offer the following alternative account of belief retention: 'To retain a belief is *not* to continue to believe the very same proposition. Rather, it is to believe a proposition related in some special way to the proposition originally believed' (1981: 6). Consider:

> (1) Nixon was president.

The temporalist might suggest that 'to believe what [1] expresses is just to believe, of what ['Nixon is president'] expresses, that it has obtained' (Richard 1981: 7). On this view, to believe what one once believed is to believe that it was the case that what one once believed obtains. For example, if Mary once believed that Nixon is president, and she retains this belief, then she now believes that Nixon *was* president. This move

would block Richard's argument. For from the assumption that Mary once believed that Nixon is president but now believes that Nixon *was* president, it does not follow that she believes that Nixon *is* president.

However, Richard thinks this account of belief retention is unacceptable. Suppose that at some time before the senior George Bush's first and only term Mary has a belief that can be expressed with:

(2) Bush will win the upcoming election.

A couple of years later Mary loses confidence in Bush's abilities and ceases to believe the content of (2). Mary then has not retained the belief that can be expressed using (2). Yet at the time in question she *would* assent to the sentence 'it was the case that Bush would win the upcoming election.' For back in the 1980s *before* Bush senior's only term Mary believed what can correctly be expressed using (2), and she has retained that belief. So Mary does believe that it was the case that Bush will be elected. To sum up: We do not want the retained belief Mary had *before* Bush senior's only term to be the same as the retained belief Mary had *during* Bush senior's only term. These are different beliefs. Yet on the suggested account of belief retention, they are treated in the same way.

Richard (1981: 8–9) suggests a second account of belief retention that the temporalist might wish to consider. The strategy is to pay lip service to eternalism: If Mary believes at t that Nixon is president, and she retains this belief, then at a later time t', Mary believes that Nixon is president at t.

This account of belief retention avoids the above problems. But Richard finds it very unappealing (1981: 9). For one thing, it does not give an account of what it is to retain a belief. For another, Richard says, there is a strong intuition to the effect that to retain a belief is to maintain a belief relation to one and the same object. But on the second account of belief retention, one does not maintain a belief relation to one and the same object. Rather, one believes one thing at one time and another thing at another time. Richard's main reason for thinking that this account fails, however, is that it is ad hoc. As Richard puts it:

> To explain the *retention* of belief, the temporalist appeals exclusively to eternal propositions. Why explain only belief *retention* by appeal to eternal propositions? Why not simply say that whenever one has a belief, the object of one's belief is eternal? If my retaining my belief, expressible yesterday by 'Nixon is president', consists in my believing that Nixon was president yesterday, why, one may reasonably wonder, isn't the belief I expressed yesterday using 'Nixon is president' the belief that *then* (yesterday) Nixon was president. (1981: 9)

If the temporalist adopts the second strategy, she will in effect treat the objects of all *retained* beliefs as eternal. But, Richard asks, why not treat the objects of *all* beliefs as eternal? Why should we treat the objects of retained beliefs differently? The temporalist has not offered us an explanation.

2.2. RECENT DEBATE

Richard's objection to temporalism has caused quite a lot of debate. Before offering my rejoinder to Richard and challenges for eternalism, a brief account of the literature on Argument A is in order. Those already familiar with the recent literature can move directly onto Section 2.3

Consider Argument (A), repeated from above:

(A)
Mary once believed that Nixon was president.
Mary still believes everything she once believed.
Therefore, Mary believes that Nixon *is* president.

Recall that (A) and related arguments present great difficulties for temporalism, because temporalism takes Mary to have believed the temporally unspecified proposition that Nixon is president. If she retains this belief, then it must be that she believes that Nixon is president. But intuitively no such thing follows from the premises of (A).

Mark Aronszajn (1996) suggests that we should bite the bullet and say that, contrary to appearances, (A) has a reading on which it is valid. Any appearances to the contrary can be explained away. For in addition to the reading on which (A) is valid, (A) also has several readings on which it is invalid. So when we evaluate (A) for validity, it is plausible that we confuse the reading on which it is valid with other readings on which it is invalid.

First, the first premise of (A), says Aronszajn, is ambiguous.[3] The sentence 'Mary believed that Nixon was president' can be interpreted as meaning that it was the case that Mary believes that Nixon is president, or as meaning that it was the case

[3] Stanley (2005: 136, note 5) thinks that the temporalist cannot account for the first reading of this premise, namely, it was the case that Mary believes that Nixon *is* president. I do not see how that would follow. I assume Stanley thinks that the temporalist is forced to treat both occurrences of the past tense as temporal operators. But if that were so, then the eternalist who treats the tenses as quantifiers would likewise be forced to treat both occurrences of the past tense as quantifiers, giving rise to the exact same problem.

that Mary believes that it was the case that Nixon was president. In the first case the past tense of the embedded verb is vacuous, and in the second case the past tense of the embedded verb is anaphoric on the past tense of the attitude verb (Ogihara 1996). The second reading is salient in 'two years ago Ruth believed that Kennedy was assassinated by the CIA.' Aronszajn points out that if the first premise is true iff Mary believed at *t* that at some time prior to *t* Nixon was president, then (A) is invalid even if temporalism is true. Though the first premise is more naturally given a reading according to which Mary believed that Nixon is president, Aronszajn points out that it is possible that we think (A) is invalid because we confuse the two readings.

Second, the second premise of (A) also has several different readings. The second premise, 'Mary still believes everything she ever believed,' contains the quantified noun phrase 'everything Mary ever believed.' English quantified sentences are typically interpreted with respect to a restricted domain of quantification. For example, 'everyone is here' is not ordinarily used to say that everyone in the universe is where the speaker is. When I stand in front of my logic class the relevant domain of quantification with respect to which 'everyone' is evaluated may simply be the domain containing all and only the students in the class (Stanley and Szabo 2000).[4]

Aronszajn thinks that it is unlikely that we would ordinarily interpret the quantified noun phrase in the second premise of (A), namely, 'everything Mary believed,' with respect to an unrestricted domain of quantification. It is more plausible that 'everything Mary believed' is interpreted with respect to a domain of quantification that is restricted, for instance, to eternal propositions. But if the quantificational domain of 'everything Mary believed' is restricted to eternal propositions, then the argument is invalid regardless of whether eternalism is right. Our feeling that the argument is invalid may thus be due to the fact that we interpret 'everything Mary believed' with respect to a restricted domain.

Aronszajn also has some thoughts about what goes wrong in argument (C). Argument (C), recall, is the following:

> (C)
> I, Mary, believed that Nixon was up to no good in the White House, and I still believe that.
> Therefore, I, Mary, believe that Nixon is up to no good in the White House.

[4] An alternative strategy is to say that quantified noun phrases under normal circumstances can be true only if the utterance is elliptical for what the speaker could have made explicit but didn't. See Neale (1990b).

The problem here is that the second conjunct in the first premise seems to read: 'I, Mary, still believe whatever I believed on the earlier occasion.' But the temporalist thinks that Mary believed a temporally unspecified proposition, namely the proposition that Nixon is up to no good in the White House. So if the second conjunct reads 'I, Mary, still believe whatever I believed on the earlier occasion,' then it follows that Mary believes that Nixon is up to no good in the White House. But intuitively, this cannot be deduced from the first premise.

In response to these considerations Aronszajn notes that there is more than one plausible reading of the premise of (C). On one reading, the word 'that' in 'I still believe that' is a demonstrative referring to the proposition believed on the earlier occasion. So, given temporalism, 'I still believe that' is to be interpreted as 'I, Mary, still believe that Nixon is up to no good in the White House.' From this the conclusion does follow. So on this reading, the temporalist is committed to the validity of (C).

But, says Aronszajn, (C) also has a second reading where 'that' goes proxy for 'that Nixon was up to no good in the White House.' On this reading, 'that' is a pronoun of laziness. A pronoun of laziness is a pronoun that goes proxy for an expression that precedes it. For example, in 'John entered the room. He took off his hat' the pronoun 'he' in the second clause goes proxy for 'John' in the first clause. If 'that' is a pronoun of laziness, then the conjunct 'I still believe that' is 'elliptical'[5] for 'I still believe that Nixon *was* up to no good in the White House.' But from 'I, Mary, believed that Nixon was up to no good in the White House, and I still believe that Nixon was up to no good in the White House' it does not follow that Mary still believes that Nixon *is* up to no good in the White House. Nor is the temporalist committed to it. The argument 'I, Mary, believed that Nixon was up to no good in the White House, and I still believe that Nixon *was* up to no good in the White House. Therefore, I, Mary, still believe that Nixon *is* up to no good in the White House' is invalid regardless of the nature of the objects of the attitudes.

Aronszajn (1996: 89) suggests that since arguments like (C) have two interpretations, our choice of interpretation is governed by the following pragmatic rule:

> Aronszajn's Rule:
> If a belief ascription is ambiguous, pick an interpretation that is charitable regarding which belief it ascribes, given prevailing conceptions of normalcy in beliefs, and any other relevant information supplied either by the context, or in the larger discourse in which the belief ascription occurs.

[5] Aronszajn does not say that 'she believes that' is elliptical in a strict syntactic sense, hence the shudder quotes.

What is going on in argument (C) then is that the semantics of the premise entails the conclusion, but we hesitate to attribute the ascribed belief to Mary. Mary may have many false beliefs about political matters, but she is not dim-witted. As Aronszajn puts it:

> [T]he semantics for ['Mary believed that Nixon was up to no good in the White House'] entails that Mary believed the non-eternal proposition that [Nixon] is up to no good in the White House, and . . . in some contexts we could accept that this *is* the proposition ['she still believes that'] says Mary believes. However, in the present context we hesitate to accept this. It would be quite abnormal today for someone to believe that [Nixon] is up to anything in the White House. So at present, we find inference [C] questionable because we now find it uncharitable to attribute such a belief to Mary. [Aronszajn's Rule] requires that we seek another, more charitable interpretation of the first line of [C]. And there is one: the lazy interpretation mentioned above. . . . But then we are taking the sentence to express a proposition . . . from which the conclusion of [C] does not follow. Hence we find the inference unacceptable. (1996: 89)

Thus, the reason that argument (C) appears invalid is that we chose the lazy reading of the second conjunct for reasons of charity. Mary is thus taken to believe that Nixon was up to no good in the White House. However, in other contexts we would take the proposition Mary believed on the earlier occasion to be the proposition that Nixon *is* up to no good in the White House. To back up this latter claim, Aronszajn invites us to consider the following arguments.[6]

> (D)
> At one point in time, most Americans believed that Elvis Presley was alive, but today, few Americans believe that.
> Therefore, few Americans believe that Elvis Presley is alive.

> (E)
> Twenty years ago, nobody believed that AIDS was spreading among heterosexuals, but now almost everyone believes that.
> Therefore, almost everyone believes that AIDS is spreading among heterosexuals

In contrast to (C), (D) and (E) seem valid. Yet 'but today, few Americans believe that' and 'but now, almost everyone believes that' cannot be 'elliptical.' For 'but

[6] Salmon (2003) and others block this argument by taking the times that go into the proposition in question to be temporally extended. I offer objections to this strategy in Chapter 3.

today, few Americans believe that' would then be elliptical for 'but today, few Americans believe that Elvis Presley *was* alive,' and 'but now, almost everyone believes that' would be 'elliptical' for 'but now almost everyone believes that AIDS *was* spreading among heterosexuals.' But on these readings of the second conjuncts of the premises, (D) and (E) are invalid. Since (D) and (E) appear to be valid, it must be that 'that' here functions as a demonstrative, and that it refers to a non-eternal proposition, just as temporalism predicts. That is, the occurrence of 'that' in (D) must refer to the proposition that Elvis Presley is alive, and the occurrence of 'that' in (E) must refer to the proposition that AIDS is spreading among heterosexuals. Thus (D) and (E) show that we sometimes do use 'that' demonstratively, just as temporalism predicts.

Arguments (D) and (E) in fact present a difficulty for eternalism. For either the two occurrences of 'that' are pronouns of laziness, or they are demonstratives. If they are pronouns of laziness, then the conclusions do not follow. For 'but today, few Americans believe that' and 'but now almost everyone believes that' then go proxy for 'but today, few Americans believe that Elvis Presley was alive' and 'but now almost everyone believes that AIDS was spreading among heterosexuals,' respectively. If the two occurrences of 'that' are demonstratives, then the conclusions follow only if the two occurrences of 'that' refer to temporal propositions. Either way, then, eternalism will deliver the verdict that (D) and (E) are invalid. But intuitively, (D) and (E) are valid. Thus (D) and (E) present a serious difficulty for eternalism.

Aronszajn takes the following argument to present a further problem for eternalism (Aronszajn 1996):

(F)

In 1990, Mary believed that Bush was up to no good in the White House.
In 1992, Mary still believed everything she believed back in 1990.
Hence, in 1992, Mary believed that Bush was up to no good in the White House.

It would seem that (F) is valid. Yet if eternalism is true, then the conclusion does not follow. For the first premise, then, is true iff in 1990 Mary believes that Bush is up to no good in the White House in 1990. The second premise is true iff for any proposition *p*, if Mary believes *p* in 1990, then she believes *p* in 1992. The conclusion is true iff in 1992 Mary believes that Bush is up to no good in the White House in 1992.

Eternalism thus appears to assign the wrong truth-conditions in this case. However, G. W. Fitch (1998) has recently argued that, initial appearances to the contrary, eternalism does make the right predictions in the case of (F). For, says Fitch, 'nothing in the

premises assures that Mary believed that Bush was up to no good in 1992 (as claimed in the conclusion).' In other words, Fitch thinks (F) is invalid. As he puts it:

> it seems to me that the natural reading of (i) is that in 1990 Mary believed that Bush was up to no good in the White House in 1990; the natural reading of (ii) is that by 1992 Mary had not changed her beliefs with respect to what she believed in 1990—in particular, in 1992 Mary still believed that Bush had been up to no good in the White House in 1990; and finally, the natural reading of (iii) follows that of (i), namely that in 1992 Mary believed that Bush was up to no good in the White House in 1992. Given these readings of (i), (ii) and (iii), it is easy to see that the inference fails, since nothing in the premises assures us that Mary believed that Bush was up to no good in 1992. (1998: 251–252)

Fitch here offers essentially eternalist truth-conditions for (F). According to Fitch, the conclusion is naturally interpreted as saying that Mary believes in 1992 that Bush is up to no good in the White House in 1992, and not as saying that Mary believes in 1992 that Bush is up to no good in 1990, as Aronszajn claims. Our pretheoretical intuitions, Fitch says, cannot be used by themselves 'to show that a given metaphysical position is correct or not' (1998: 254). Appeals to intuition are notoriously self-serving.

The upshot is that eternalism and temporalism assign different truth-conditions to the conclusion of (F). Temporalism predicts that the conclusion is true iff Mary believes in 1992 that Bush is up to no good in the White House. Eternalism, on the other hand, predicts that the conclusion is true iff Mary believes in 1992 that Bush is up to no good in the White House in 1992. So, for the temporalist, but not for the eternalist, ['Bush is up to no good at the White House']$_{90}$ = ['Bush is up to no good at the White House']$_{92}$. If the temporalist is right about this identity claim, then (F) is valid. If she is wrong about it, then (F) is invalid. In Fitch's opinion, it is a mistake to think that our pre-theoretical intuitions can somehow settle the validity of (F).

Just in case the temporalist sticks to her guns, however, Fitch offers the following kind of exchange in support of eternalism (255–256):[7]

> PORTLAND
> (John and Mary are on the phone on March 1.)
> JOHN: Where are you?
> MARY: I am in Boston
> (One month later at an APA meeting in Portland.)

[7] I have changed his example slightly.

JOHN: Did you believe what you said on March 1?
MARY: Yes, and I still believe it.

PORTLAND is supposed to cause trouble for the temporalist. For according to temporalism, the object of Mary's belief at the APA meeting is the temporal proposition that she is in Boston. But surely, Mary does not believe that she is in Boston at any time during the APA meeting. It might perhaps be thought that we can explain the felicity of Mary's remark by treating the 'it' as a pronoun of laziness. However, this is unlikely to help. For if the 'it' is a pronoun of laziness, then it goes proxy for 'I am in Boston.' But intuitively Mary is not saying in Portland that she still believes that she is in Boston. Whatever the merits of the laziness strategy, it is indefensible here. PORTLAND cases spell trouble for temporalism.

2.3. TEMPORALISM AND BELIEF REPORTS

Richard (1981) argued that apparently invalid arguments of the following sort spell trouble for temporalism:

(A)
Mary believed that Nixon was president.
Mary still believes everything she once believed.
Therefore, Mary believes that Nixon *is* president.

Before offering my reply, a few remarks about 'say' and 'believe' are in order. Our talk about what is believed, what is said, believing the same thing and saying the same thing, and so on, is quite loose along a number of dimensions. Here is a simple example.[8] I say to the department chair 'John is acting weird today.' You say to the chair, 'Something is going on with John today.' In the right context, the chair can say 'Brit said the same thing' and no one would find it odd. But no view has you and me saying something that expresses the same proposition.

More interestingly, often we can appropriately be said to believe the same thing when we clearly believe different things but there is a significant overlap in the propositions we each believe. For instance, Al says 'I believe I am being controlled by aliens.' Aidan says: 'I believe I am being controlled by aliens.' I can now appropriately say to Aidan: 'Al believes the same thing.' No one would find this odd, even though

[8] See also Cappelen and Lepore (2005), Heck (2006), and Cappelen and Hawthorne (2009).

very few views of propositions would have them believe the same thing. Moreover, the following argument seems fine to most untutored folks:

Al believes he (Al) was abducted by aliens.
Aidan believes everything Al believes.
So, Aidan believes he (Aidan) was abducted by aliens.

Given that our talk of what is believed, what is said, believing the same thing, and so on, is quite loose, the temporalist has the option of saying that the original A-style arguments are taken to be invalid because, for reasons of charity, we assign a loose interpretation to 'Mary still believes everything she once believed.' What Mary is thinking now (if we are to avoid insulting Mary) isn't what she was thinking. That is, she is not now thinking that Nixon is president. Rather, she is thinking that he was president. But *Nixon was president* and *Nixon is president* can count as the same thought because they differ only in tense. If they do count as the same thought, then Mary might, loosely speaking, believe everything she used to believe and yet fail to believe that Nixon is president.

Though this sort of reply is available to the temporalist, I would like to set it aside for now. For I think that there is an alternative line of defense that is equally plausible. I now turn to this line of defense. I return to the alternative line of defense below.

Mark Aronszajn (1996) replied to Richard's objection that argument (A) is indeed valid, and that the feeling that (A) is invalid can be accommodated. According to Aronszajn, the first premise is ambiguous between a vacuous and a non-vacuous reading of the 'was.' On the first reading, Mary stood in the belief relation to the content of 'Nixon is president.' On the second reading, Mary stood in the belief relation to the content of 'Nixon was president.' If the first premise is assigned the second reading, temporalism correctly predicts that (A) is invalid. Aronszajn thus suggests that our intuitions (at least partially) track the second reading of the first premise.

I think Aronszajn is onto something right. I agree with him that A-style arguments are valid. But I want to offer a different explanation of why they may seem invalid. Notice that the following A-style argument without the vacuous past tense is considerably less offensive than (A):

(G)
Two days ago Mary believed that Bush was president
Yesterday Mary believed whatever she believed two days ago.
So, yesterday Mary believed that Bush was president (yesterday).

Here is another case:

(H)

John has always believed that Mary loves him.

John will always believe everything he has ever believed.

John will always believe that Mary loves him.

Informants judge (H) to be valid.[9] And that is exactly what temporalism predicts. According to temporalism, John has always stood in the belief relation to *Mary loves him*. But by the second premise, if John ever stood in the belief relation to a particular proposition, then he always will stand in the belief relation to that proposition. It follows that John always will stand in the belief relation to the temporal proposition *Mary loves John*.

Eternalism, on the other hand, makes the wrong predictions. Eternalism predicts that the first premise can be read as 'for all past times *t* up until and including the present moment, John believes that Mary loves him at *t*.'[10] So, at 3 p.m., on Christmas Eve, 2002 John believes that Mary loves him at 3 p.m. on Christmas Eve, 2002. The second premise says that if John ever believed a proposition, he will always believe it in the future. So it follows that John will always believe that Mary loves him at 3 p.m. on Christmas Eve, 2002, and so on for all other past times. But that is not what the conclusion says. The conclusion says: 'For all future times *t*, John believes that Mary loves him at *t*.' For example, at 8 p.m. on New Year's Eve, 2020, John believes that Mary loves him at 8 p.m. on New Year's Eve, 2020, and so on for all the other future times.

The fact that (H), unlike (A), is judged to be valid suggests that it is the vacuous past tense that causes the trouble. Unlike Aronszajn, however, I do not think that the trouble arises because we read the first premise as containing the non-vacuous past tense. Rather, I think that in our weaker moments we forget to dispose of the vacuous past tense as we arrive at the conclusion. We are tempted to infer that Mary believes that Nixon *was* president, even though 'was' is not vacuous when it occurs within the scope of a present-tensed form of 'believe.'

The vacuous past tense hypothesis goes some way towards explaining the apparent invalidity of the original A-style arguments. However, I do not think it can account for all the relevant invalidity judgments. The vacuous past tense certainly cannot be the culprit in future-tensed arguments like the following:

[9] I have chosen to rely on the judgments of untutored informants, because, as Fitch (1998) rightly points out, philosophers' judgments can be biased.

[10] I am ignoring any implicit restrictions to times at which John was alive, times at which he has known Mary, and the like. The first premise also has a less natural reading where it says that John has always believed that Mary loves him at the time of speech, and the conclusion has a less natural reading where it says that John will always believe that Mary loves him at the time of speech. Since these readings are less natural, I shall ignore them here.

(I)
In ten years John will believe that a democrat is president.
Today John believes whatever he will believe in ten years.
So today John believes that a democrat is president.

Some informants judge (I) to be invalid. Yet there is no vacuous past tense in the first premise. So what is going on? Here is one plausible explanation. Temporalism correctly predicts that (A)-style arguments with a factive attitude expression in the first premise and in the conclusion are invalid. Consider, for instance:

(J)
Mary once truly believed that Nixon was president.
Mary still believes everything she once believed.
Therefore, Mary truly believes that Nixon *is* president.

According to temporalism, the first premise is true iff at some past time *t* Mary believes at *t* that Nixon is president, and 'Nixon is president' is true at *t* (because 'so-and-so truly believes that' is factive). The second premise says 'if Mary once believed *p*, then she still believes *p*.' Hence, it follows that Mary believes that Nixon is president, but it doesn't follow that it is true that Nixon is president. So temporalism predicts that (J) is invalid, which is as it should be.

My hypothesis now is that the original A-style arguments are sometimes judged to be invalid because the arguments are read in the same way as (J), that is, at least some of the occurrences of 'S believes that' are treated as synonymous with 'S truly believes that', perhaps based on the supposition that S is moderately rational and knowledgeable.

How do we test this hypothesis? Well, when I asked informants to explain why argument (B) sounds awkward,

(B)
Mary believes everything John said.
John said that he was hungry.
Therefore, Mary believes that John is hungry.

many of them replied that "just because John *was* hungry, it doesn't follow that he *is* hungry," which suggests that they read 'John said that' and 'Mary believes that' as synonymously with 'John truly said that' and 'Mary truly believes that'.

Further support of the factivity hypothesis comes from the fact that A-style arguments with a clearly non-factive attitude verb or a clearly false embedded proposition

are judged by the same informants to be valid, as predicted by temporalism.[11] Here are a few examples of such arguments:[12]

(K)
John will be thinking that Mary is hungry.
Everything John will be thinking he is thinking now.
Therefore, John is thinking that Mary is hungry.

(L)
Yesterday John believed that Arnold Schwarzenegger was the president of the United States.
Today John believes whatever he believed yesterday.
Therefore, John believes that Arnold Schwarzenegger is the president of the United States.

(M)
Yesterday John pretended that he was a famous actor.
Now he is pretending that same thing again.
Therefore, John is pretending that he is a famous actor.

(N)
Yesterday John dreamed he was the president of the United States.
Now he is dreaming the same thing as yesterday.
Therefore, John is dreaming that he is the president of the United States.

Unlike eternalism, temporalism correctly predicts that these arguments are valid (the verdict of untutored informants).

Of course, the eternalist might reply that our talk of what is believed, what is said, believing the same thing and saying the same thing is quite loose, and that, for instance, what John is thinking now isn't what he will be thinking, even though they can count as the same thing because they differ only in time. Recall, however, that this sort of reply is also available

[11] There are two ways to guarantee a 'non-factive' reading. Pick an obviously false operand sentence, or construct the argument with attitude verbs like 'is entertaining the thought that,' 'is thinking that,' 'imagines that,' 'pretends that,' 'hopes that,' and so on.

[12] It may be argued that some arguments with a clearly non-factive attitude verb sound invalid. Consider 'yesterday John pretended that he was having lunch with Tom Cruise in Manhattan. Today he continues to pretend everything he pretended yesterday. Therefore, John is pretending that he is having lunch with Tom Cruise in Manhattan.' However, even the latter argument is judged by the same informants to be valid.

to the temporalist in the original (A)-style cases. So if the eternalist makes this sort of move here, then temporalism is off the hook. I shall set aside this sort of reply for now.

If we set aside this sort of reply, then only temporalism gets things right when it is obvious that the attitude verb is non-factive or a complement clause is false. This strongly suggests (i) that temporalism also makes the right predictions in the original A-style arguments, and (ii) that the original A-style arguments are sometimes judged to be invalid because some occurrences of 'believe' are read as synonymous with 'truly believe'.[13]

Arguments with a factive attitude verb seem to present a further challenge for temporalism:[14]

(O)
It will come to pass that John is rich.
Mary knows everything that will come to pass.
So Mary knows that John is rich.

(P)
Mary knew that Nixon was president.
Mary knows everything she once knew.
So Mary knows that Nixon is president.

At least some informants judge these arguments to be invalid. But temporalism predicts that these arguments should be valid. The problem is that there is no vacuous past tense, and no occurrences of 'believe.' However, I think that there is a straightforward explanation of why these arguments are judged to be invalid. Compare (O) and (P) to the following arguments:

(Q)
It will come to pass that John is rich
Everything that will come to pass is true now and known by Mary.
So Mary knows that John is rich.

(R)
Mary knew that Nixon was president.

[13] I am not suggesting that philosophers make this mistake. Philosophers who judge the arguments to be invalid are often biased and hence not reliable informants.

[14] One might offer the following eternalist translation of the second premise: For any true proposition x such that $\exists t(t^* < t$ & x's matrix says something will happen at $t)$, Mary knows at t^* that x (the matrix of a claim like '$\exists t(t^* < t$ & John is rich at $t)$' is '$t^* < t$ & John is rich at t).'

Everything Mary once knew is true now and known by Mary.
Mary knows that Nixon is president.

Unlike (O) and (P), (Q) and(R) are judged to be valid. But the only difference between the first pair and the second pair is that the second pair makes explicit that 'S knows that' is factive. 'Mary knows everything that will come to pass' entails 'Everything that will come to pass is true now' and 'Mary knows everything she once knew' entails 'Everything Mary once knew is true now.' Since the only difference between the two pairs of arguments is that the second pair makes the factivity of 'S knows that' explicit, it seems that (i) temporalism, unlike eternalism, makes the correct predictions in all four cases, and that (ii) the apparent invalidity of (O) and (P) owes to a failure to treat 'S knows that' as factive.

2.4. TEMPORALISM AND BELIEF RETENTION

I have argued that the apparent invalidity of A-style arguments originate in failure to treat non-factive verbs as non-factive, factive verbs as factive, or the vacuous past tense as vacuous.[15] However, I think there is still something left to explain. Phrases like 'Mary still believes that' and 'I still believe it' appear to admit of two different readings, as the following examples show:[16]

PORTLAND
(John and Mary are on the phone on March 1.)
JOHN: Where are you?
MARY: I am in Boston.
(One month later at an APA meeting in Portland.)
JOHN: Did you believe what you said on March 1?
MARY: Yes, and I still believe it.

SAN FRANCISCO
(Amie and Kent are on the phone on March 1.)
AMIE: What do you think about Kripke's latest piece?

[15] I leave out the possibility that the A-style arguments are judged to be invalid because the judge's intuitions are theoretically loaded.

[16] The eternalist could explain the difference between PORTLAND and SAN FRANCISCO by construing 'I am in Boston' as 'I am in Boston at interval i_1' and 'I think it is very interesting' as 'I think it is very interesting at interval i_2.' Moreover, in PORTLAND the time of utterance of 'yes, and I still believe it' lies outside of i_1, whereas in SAN FRANCISCO the time of utterance of that sentence lies inside of i_2. For objections to an interval analysis of tense, see Chapter 3.

KENT: I think it is very interesting.

One month later at an APA meeting in San Francisco.)

AMIE: Did you believe what you said on March 1?

KENT: Yes, and I still believe it.

In the first exchange, Mary couldn't plausibly be taken to believe at the APA meeting in Portland that she is in Boston, but in the second exchange Kent is very likely saying that he believes at the APA meeting that Kripke's latest piece is very interesting. Notice that if the 'it' is a deictic/anaphoric pronoun, and deictic/anaphoric pronouns depend for their reference on the speaker's intentions, both uses must be literal uses.[17] But neither the eternalists nor the temporalists can explain the two uses without amendments to their theory.[18] The eternalist makes the correct predictions in the first case, and the temporalist makes the correct predictions in the second case.

To explain why pronouns are used to pick up different kinds of belief content I suggest that we reconsider Richard's alternative approaches to belief retention.[19] According to both approaches offered by Richard, 'to retain a belief is *not* to continue to believe the same proposition. Rather, it is to believe a proposition related in some special way to the proposition originally believed' (1981: 6). On the first account, what one believes when one retains a past belief is a past-tensed version of that belief. If, for example, I believe that John is hungry, and I retain the belief, then I believe that John was hungry. But, as Richard pointed out, this account is unable to distinguish the retained belief that John was hungry, which originated in a 1985 belief, and the retained belief that John was hungry, which originated in a 1990 belief.

[17] Anaphoric pronouns often depend for their reference on the speaker's intentions. Consider, for instance, 'John believes he is hungry. Alice also believes that.' Here is another case. 'The man who gave his paycheck to his wife was wiser than the man who gave it to his mistress' (Karttunen 1969).

[18] Here are some further cases that seem to cause trouble for the eternalist: 'John will believe that Mary is rich. Alice will also believe that,' 'John believed back in 1982 that Mary was rich. Alice didn't believe it.' The 'it' here seems to refer to the temporal proposition that Mary is rich.

[19] Future-tensed cases are considerably more difficult because they are rarer in ordinary language. Consider, for instance, 'John will believe that Mary is rich. Alice already believes that.' Are we to interpret the second sentence as 'Alice already believes that Mary is rich' or as 'Alice already believes that Alice will be rich'? Perhaps both readings are available here as well. In the one case what Alice already believes is the content of 'Mary is rich'; in the other case what Alice already believes is the content of 'Mary will be rich.' I see no reason why we cannot simply say that the 'it,' in principle, could pick up either proposition, namely, *Mary is rich* or *it will be that Mary is rich*. The 'it' might pick up the second proposition, because it overlaps substantially with *Mary is rich*. Given the substantial overlap, the hearer can presumably figure out from linguistic and extra-linguistic context what the speaker means.

On the second account, what one believes when one retains a belief one once had is a temporally specified version of that belief. But, Richard (1981: 9) argues, once the temporalist grants that the objects of retained beliefs are eternal, she might as well grant that the objects of all beliefs are eternal.

The two strategies furthermore suffer from the problem that they fail to explain what belief retention consists in if not the 'maintaining of a relation (belief) to a particular object (presumably) a proposition' (1981: 9).

However, I think that Richard has not considered all available accounts of belief retention. The second account does indeed seem ad hoc. But the first account is not ad hoc. The problem with the first account, as it stands, is that it makes retained beliefs too unspecific. There is, however, a modified form of it, also denying that the belief retained is identical to the original belief, but which does not make retained beliefs too unspecific.

As I will argue in Chapter 4, the tense operators of English, if there are any, are not restricted to temporal prefixes such as 'it was the case that,' 'it will be the case that,' and its ilk. Basic tense operators, such as 'it was the case that' and 'it will be that case that,' can combine with time adverbials, such as 'yesterday,' 'now,' 'two weeks ago, 'in 1981,' 'during World War II,' 'during Bush's first term,' 'when my students handed in their papers,' and so on, to form composite operators. Thus, the tense operators of English, if such there are, include 'it was the case during World War II that,' 'it was the case last Friday that,' 'it will be the case when my students have handed in their papers that,' and so on.

On Richard's first account of belief retention, to retain a belief is to believe a past tensed version of the object of the original belief. I agree that the primary way to retain a belief is to maintain a belief relation to one and the same object over time. But one can also retain a belief in a secondary way by maintaining a belief relation to an object that is appropriately related to the original object, namely the object of the original belief occurring within the scope of *some* past tense operator or other.[20] Which past tense operator it is will depend on the information the individual in question retains. Suppose at some time *t* while Bush is in office Mary believes that Bush is

[20] Interestingly, what Chalmers says about coordination matches up with what I say about objects of belief. See Chalmers, forthcoming. According to Chalmers, cases like 'Pierre believes that London is pretty' show that that 'an attitude ascription can be true even if the ascribee does not endorse precisely the enriched proposition that S expresses for the ascriber' (20). 'Pierre believes that London is pretty' is true if Pierre endorses a proposition that is co-ordinate with the one the operand sentence expresses for the ascriber. In Chalmers' view, '*p* is coordinate with *q* iff (i) *p* and *q* have the same Russellian component and (ii) *p* determines an S-appropriate primary intension, where S is the sentence used to express *q*' (21) In Chalmer's terminology, I would say that to retain the belief that Bush is president, you must retain a proposition coordinate with the one expressed by *Bush is president*, namely *Bush was president*. Thanks to Chalmers here.

president. When Bush's term is up, she will stop believing that Bush is president and form the belief that Bush was president during this or that particular period. Twenty years later Mary might have forgotten when exactly Bush was president. But she might well believe that, say, it was the case when she and Bob got married that Bush was president, that it was the case when she and Bob were expecting their first child that Bush was president, or that it was the case when Bob got promoted that Bush was president.

The suggested variation on Richard's first account of belief retention sidesteps the above difficulties. Suppose again that at some time during George Bush Senior's first and only term Mary has a belief that can be correctly expressed using:

(2) Bush will win the upcoming election.

A couple of years later Mary loses confidence in Bush's abilities and stops believing the content of (2). Mary then has not retained the belief that can be expressed using (2). Yet at that time she would assent to the sentence 'it was the case that Bush would win the upcoming election.' For back in the 1980s before the senior Bush's first and only term Mary believed what can be correctly expressed by (2), and she has retained that belief. So Mary does believe that it was the case that Bush would win the upcoming election.

On the suggested account of belief retention, however, the two beliefs about the presidential elections need not be retained in the same way. Mary might believe, for instance, that it was the case back in the 1980s that Bush would win the upcoming election, while also believing that it wasn't the case during Bush's first and only term that he would win the upcoming election. What exactly Mary believes will depend on what information she retains. Of course, it may well be that when we retain the belief that *p*, all we believe is that it once was the case that *p*. My point here is only that retained beliefs of the sort considered by Richard *can* be distinguished on an appropriately worked out account of belief retention.

It might be thought that this reply encounters new trouble. For it seems that there is no way of specifying the content of the belief expressed when people say things like 'I still believe that' or 'I still believe it.' We cannot take a peek at their brains, as it were. So if the suggested account is correct, how would we ever be able to grasp the content of 'I still believe that'?

There is a simple reply. If I say 'I believed that Nixon was up to no good in the White House, and I still believe that,' then the 'that' refers to a simple past-tensed form of the original belief, namely *Nixon was up to no good in the White House*. So the second conjunct means 'I believe that Nixon was up to no good in the White House.' And that may well be true, even if none of my belief states has the exact content *Nixon was up to*

no good in the White House. In other words, if the exact content of one of my belief states were *Nixon was up to no good in the White House when he was president*, 'Brit believes that Nixon was up to no good in the White House' might still be an adequate description of what I believe.

This latter suggestion violates what Kent Bach (1997) calls 'The Specification Assumption':[21]

> *The Specification Assumption*
> A sentence or clause embedded in a propositional attitude context, when disambiguated, specifies precisely the content to which the subject in question is related.

According to the Specification Assumption, if 'Mary believes that it was the case that Nixon is president' has been disambiguated, then Mary stands in the belief relation to the proposition *it was the case that Nixon is president*. So if Mary believes that it was the case when she and Bob got married that Nixon is president, then 'Mary believes that Nixon was president' is an inadequate report of Mary's belief.

Bach (1997) and Delia Graff Fara (2003) have both offered good reasons for rejecting the Specification Assumption. Bach's main reason for rejecting it is he thinks it is the best way to avoid familiar Frege/Kripke puzzles of the following sort (Kripke 1979):

> (3)
> Lois Lane believes that Superman can fly.
> Lois Lane disbelieves that Clark Kent can fly.
> John believes Paderewski had musical talent.
> John disbelieves Paderewski had musical talent.

The puzzle is that it seems that pairs of sentences like these can all be true, even though 'Clark Kent' and 'Superman' co-refer, and the two occurrences of 'Paderewski' co-refer. John might believe, say, that Paderewski, the pianist, had musical talent, but disbelieve that Paderewski, the statesman, had musical talent. The puzzle, however, rests on the Specification Assumption.

On Bach's view, a belief report of the form 'S believes that *p*' ascribes a dyadic relation between S and the proposition that *p*. But *p* may not be the exact content of S's belief. The 'that' clause in the report *describes* the exact content of S's belief, it doesn't *specify* it. As the exact content of S's belief may be considerably more specific than

[21] This is Fara's (2003) formulation of it. For discussion see also Colin McGinn (1982: 216) and Brian Loar (1988).

the content of 'that *p*,' the sentences in (3) may all be used to make true belief reports.[22]

Delia Graff Fara (2003) gives different reasons for rejecting the Specification Assumption. Against it she offers examples like the following:

(4)
a. Bob wants to smoke a cigarette.
b. Christian hopes he will find a cheap place to live.
c. Jim wishes he were somewhere warmer.

These sentences plausibly have a wide scope reading where 'a cigarette,' 'a cheap place to live' and 'somewhere warmer' take wide scope with respect to the attitude verb. On the wide-scope reading, (4a) means that there is a particular cigarette that Bob wants to smoke (for example, the cigarette I am smoking), (4b) means that there is a cheap place to live which Christian hopes to find (for example, a place I told him about), and (4c) means that there is a warmer place where Jim wishes he were (for example, the Greek island I went to last summer). However, I shall focus on the narrow scope readings.

Intuitively, (4a) may be true even if Bob has no desire that could be satisfied by smoking a cigarette that has been floating in a glass of beer most of the night, (4b) may be true even if Christian has no hope that is satisfied if he finds an empty dorm room, and (4c) may be true even if Jim has no wish that would be satisfied if he were in Sahara during the warmest month of the year. The Specification Assumption thus seems at odds with our normal ways of reporting propositional attitudes. Fara adheres to something like 'The Content-Satisfaction Principle' (156):[23]

> *The Content-Satisfaction Principle*: If one has a desire/hope/wish with the exact content that *p*, then one has an actual desire/hope/wish which is satisfied *at* any possible world in which it is true that *p*.[24]

Since Bob's desire to smoke a cigarette isn't satisfied in worlds where he smokes an old, beer-soaked cigarette, Bob's desire does not have the exact content *Bob smokes a cigarette*.

[22] See also Brian Loar (1988), Richard (1990), and Sider (1995).

[23] I have changed the original principle slightly. An alternative principle is this: S desires/hopes/wishes that *p* iff *p* is true at all worlds compatible with the exact content of S's actual desires/hopes/wishes. Of course, a world cannot be a metaphysically possible world, as Bob might desire something that is metaphysically inconsistent. See David Chalmers (manuscript, b).

[24] The principle assume that the *truth at/truth in* distinction is well-defined. For the *truth at/truth in* distinction, see for example Fine (1977) and Mentzel (1993).

Since Christian's hope that he will find a cheap place to live isn't satisfied in worlds where he finds a cheap dorm room, Christian's hope doesn't have the exact content *Christian finds a cheap place to live*. And since Jim's wish to be somewhere warmer isn't satisfied in worlds where he is in Sahara during the warmest month of the year, Jim's wish does not have the exact content *Jim is somewhere warmer*. So the Content-Satisfaction Principle is true and the Specification Assumption false.

It may be countered that it has not been ruled out that sentences like those in (4) are cases of loose talk that is false yet close enough to the truth. But normally when we speak 'loosely,' we are able to recognize that we are speaking that way. However, this is not obviously so for the sentences in (4).

I think that there are two other reasons for denying that the sentences in (4) are cases of loose talk.[25] First, if Bob wants a dry cigarette but has no desire that is satisfied if he is offered a soaked one, it sounds much worse to say that Bob doesn't want a cigarette than saying that he wants one. Likewise, if Christian hopes that he will find a cheap place to live but has no hope that is satisfied if he finds an empty dorm room, it sounds much worse to say that Christian has no wish to find a cheap place to live than saying he hopes he will find one.

Second, the following examples,

> France is roughly hexagonal, but it is not hexagonal.
> It is almost 3 o'clock, but it is not 3 o'clock.

do not sound too awful. But the analogous attitude reports sound terrible:

> Bob wants to smoke a dry cigarette, but he doesn't want to smoke a cigarette.
> Christian hopes that he will find a cheap and decent place to live, but he has no desire to find a cheap place to live.
> Jim wishes he were somewhere a bit warmer, but he has no wish that would be satisfied if he were somewhere warmer.

Belief ascriptions seem to behave in the same way as desire, hope, and wish ascriptions. The following conjunctions, for example, sound ghastly:

> Mary believes that Nixon was president when she and Bob got married, but Mary doesn't believe that Nixon was president.

[25] Besides, not everyone thinks that loose talk is false. Lewis (1980: 24) and King (2003: 214) both suggest that we might give a semantic account of loose talk. But I shall set aside that possibility here.

I believe that you did the right thing when you asked John to move out, but I don't believe that you did the right thing.

I think Chris passed the exam last Friday, but I don't think Chris passed the exam.

The infelicity of these cases suggests that a belief report may be true, even if the belief ascribed does not match the content of the person's belief exactly. 'I believe that Chris passed the exam,' for example, may be true in spite of the fact that *Chris passed the exam* isn't the exact content of any of my belief states.

Fara suggests the following assumption in place of the Specification Assumption:[26]

The Entailment Assumption

An attitude ascription of the form '*A* ϕs *p*' is true if A has a ϕ with the proposition *q* as its exact content for some *q* that entails the proposition expressed by the embedded clause *p*.

By the Entailment Assumption, 'Bob wants to smoke a cigarette' might be true, even if Bob has no desire that is satisfied if he were offered a soaked cigarette.

If the assumption is correct, then there is no problem in taking the second conjunct in 'I believed that Nixon was up to no good in the White House, and I still believe it' to express the proposition that I still believe that Nixon was up to no good in the White House. An upward-entailing past-tensed sentence with a time adverbial entails the past-tensed sentence that results from deleting the time adverbial.[27] For example, 'I believe that it was the case when Nixon was president that he was up to no good in the White House' entails 'I believe that it was the case that Nixon was up to no good in the White House.' So 'I believe that Nixon was up to no good in the White House' may be true, even if *Nixon was up to no good in the White House* is not the exact content of any of my belief states.[28]

[26] Fara doesn't actually name the assumption. Also, her assumption is bidirectional and restricted to desire/hope/wish.

[27] 'It never was the case that Bob quit smoking in Boston,' of course, doesn't entail that it never was the case that Bob quit smoking.

[28] An objection here arises. It might seem that my account entails that it is possible for you and me to believe the very same thing in 1963, namely that the Rolling Stones are awesome, both retain that belief, but believe different things in 2006, namely that it was the case in 1963 that the Rolling Stones are awesome, and that it was the case the year Kennedy got shot that the Rolling Stones are awesome. Thanks to John Gabriel for discussion here. By way of reply, I do not want to say that the exact content of our beliefs was ever: Rolling Stones are awesome, period. The exact content of our beliefs is part of a whole web of belief, and the content of the relevant belief report describes a part of, or abstracts from, this web of belief (Loar 1988; Bach 1997).

The suggested account of belief retention thus sidesteps the obvious worries about Richard's first account of belief retention, *and* it allows the temporalist to explain the ambiguity of 'I still believe it.' Consider again the PORTLAND example, repeated from above:

> PORTLAND
> (John and Mary are on the phone on March 1.)
> JOHN: where are you?
> MARY: I am in Boston.
> (One month later at an APA meeting in Portland.)
> JOHN: Did you believe what you said on March 1?
> MARY: Yes, and I still believe it.

It is quite plausible that when Mary says 'I still believe it' she simply means that she believes that it was the case when John and Mary were talking on the phone that she is in Boston. The belief that she is in Boston is retained by maintaining a belief relation, not to the content of 'I am in Boston,' but rather to, say, the content of 'I was in Boston.' PORTLAND cases are thus rendered unproblematic.

In general, it seems that when we say 'I still believe that' or 'I still believe it,' we often do not mean that we believe the proposition originally believed. Rather, what we mean is that we believe a past-tensed form of the original belief. Witness: 'Twenty years ago Mary believed Bob loved her, and she still believes it.'

We still need to respond to Richard's worry that an adequate account of belief retention should take belief retention to be the maintaining of a belief relation to one and the same object. My reply proceeds as follows: There is no good reason for thinking that this is the only way of retaining belief. There are definitely ways to read 'belief retention' according to which retaining a belief over time does not require standing in a belief relation to one and the same object. We sometimes form beliefs consciously and then store them in memory for long periods of time. When we store a belief for the long term, we store it as a belief about the past. We may store it together with temporal markers such as 'my first year of college' or 'when my parents got divorced.' But we need not store it together with markers that refer to a specific time.

I grant that Richard's account of belief retention is correct on one natural reading of 'belief retention.' But temporalism does indeed allow that one can stand in a belief relation to one and the same object over time: First, it doesn't rule out that one can continue to believe that John is a firefighter at 3 p.m. April 5, 2006 (CST). For 'John is a firefighter at 3 p.m. April 5, 2006 (CST)' clearly expresses the proposition that John is a firefighter at 3 p.m. April 5, 2006 (CST), and I am capable of believing it. Second,

temporalism leaves open the possibility that one can continue to believe one and the same temporal proposition, for example, the proposition that John is a firefighter.

2.5. BELIEF *DE SE*

There is an alternative way of responding to the problems set forth by Mark Richard and G. W. Fitch. As John Perry (1977) and David Lewis (1983) have made vivid, indexicals in attitude contexts seem to make trouble for our standard conception of belief.[29] In one of Perry's examples (1977),[30] an amnesiac Rudolf Lingens is lost in a grand library. By reading a self-updating biography of himself, he learns that Rudolf Lingens is lost in the Stanford library. But regardless of how much he reads, Rudolf will not know who he is, or where he is. If he is told that he is Rudolf Lingens, and that he is in the Stanford library, he learns something no book could teach him. This is initially puzzling, for following David Kaplan's (1989) theory of indexicals, 'Rudolf Lingens is lost in the Stanford library' and 'I am lost in the Stanford library' have the same content when uttered by Rudolf Lingens. So the content of Rudolf's belief states would seem to be the same on the two occasions.

Here is another example involving temporal indexicals due to Peter Ludlow (1999: introduction): Suppose that Peter who is working at his desk (on March 12 to be specific) thinks to himself 'Our 5th anniversary is March 12. I should think about buying an anniversary present.' Later that same day Peter finds out that today's date is March 12. He panics. But that is rather strange if his belief hasn't changed.

Arthur Prior makes a similar point. When one says 'thank goodness that's over!' one does not mean:

> Thank goodness the date of the conclusion of that thing is Friday, June 15, 1954, even if it be said then. (Nor, for that matter, does it mean 'Thank goodness the conclusion of that thing is contemporaneous with this utterance'. Why should anyone thank goodness for that?) (1959: 17).

To account for indexicals in the scope of attitude verbs, David Lewis (1983) suggests an alternative account, inspired by Perry's (1977) theory of self-locating belief. On this account, to believe something is to self-ascribe a property. If Rudolf Lingens has a belief that he might express using 'I am Rudolf Lingens,' he is self-ascribing the property of being Rudolf Lingens. If Peter has a belief that he might express using 'our 5th

[29] See also Geach (1957), Prior (1959), and Castañeda (1999).

[30] I have changed the example slightly.

anniversary is today' he is self-ascribing the property of being located on a day that is his and his wife's 5th anniversary. Lewis calls self-locating belief 'belief *de se*.' De Dicto belief is but a special case of *de se* belief. To believe a proposition is to locate oneself in logical space. To believe that snow is white, for example, is to ascribe to oneself the property of inhabiting a world where snow is white.

If one accepts this account of beliefs, then the problems Richard and Fitch set forth for temporalism would seem to go away. Consider argument (A), repeated from above:

(A)
Mary believed that Nixon was president.
Mary still believes everything she once believed.
Therefore, Mary believes that Nixon *is* president.

Temporalism is a metaphysical thesis about propositions, not about properties. So the temporalist could take the first premise to be true at a context *c* iff there is some past time *t* such that at *t* Mary self-ascribes the property of inhabiting a world where Nixon is president at *t*. The second premise is true at *c* iff Mary self-ascribes every property she once self-ascribed. From these premises the conclusion does not follow, and (A) is invalid, which is as it should be.

I find this strategy inadequate, however. I think a temporalist should allow for properties that can be instantiated at one time but not at another, for instance, the property of being a firefighter. We may think of such properties as determining functions from <world, time> pairs to sets of individuals.[31] To instantiate the property of being a firefighter at <*w*, *t*> is to be in the extension of 'is a firefighter' relative to <*w*, *t*>.

But if one holds both that there are transient property instantiations, and that the semantic value of 'Nixon is president' is a temporal proposition, then it is rather strange to take Mary to have self-ascribed the time-indexed property of inhabiting a world where Nixon is president at *t*. It is more natural to take her to have self-ascribed the property of being located at a time at which Nixon is president. If there is such a property, it can be had transiently. Today no one has it. But all of us have the property of being located at a time at which Nixon was president.[32]

If, however, the first premise of (A) takes Mary to self-ascribe the property of being located at a time at which Nixon is president, then (A) is valid. For (A) can then be paraphrased as follows:

[31] Andy Egan defends this theory of properties in his (2004). Unlike Egan, I do not think that the semantic value of a predicate is always a property. See Brogaard (2007a).

[32] For further discussion of tensed properties and relations see Bigelow (1996), Crisp (2003), Keller (2004), Brogaard (2006b), and Torrengo (2006).

At some past time *t* Mary self-ascribes the property of being located at a time at which Nixon is president.
If at some past time *t* Mary self-ascribes a property *P*, then at *t** Mary self-ascribes *P*.
At *t** Mary self-ascribes the property of being located at a time at which Nixon is president.

As the conclusion evidently follows from the premises, an alternative strategy would be required to explain the apparent invalidity of (A).

It is not surprising that the *de se* strategy does not resolve the eternalism/temporalism debate. For, as Lewis points out, 'to any set of worlds whatever, there corresponds the property of inhabiting some world in that set. In other words, to any proposition there corresponds the property of inhabiting some world where that proposition holds' (1983: 135). The eternalism/temporalism debate does not go away by making the problematic contents the constituents of properties.

As for self-locating beliefs more generally, I do think we need a theory of content that goes beyond Kaplan's theory. To account for de se beliefs, for example, we will need belief content that has a truth-value only relative to a world in which an individual is marked. If we take 'I am lost in the Stanford library' to express a set of centered worlds (or a corresponding structured proposition), then we can take Rudolf Lingens, belief that he is lost in the Stanford Library to be a belief with a content that contains the subset of worlds in which he is the individual in the center. This view forms a natural component of the view outlined in the Introduction to the effect that some mental states have centered contents.[33]

The puzzling cases involving belief reports, on the other hand, can be adequately dealt with in the way suggested by Chalmers (forthcoming). On this view, belief reports can describe different exact belief contents. Which belief content is described depends on which primary intension the ascriber associates with the exact belief content described.[34]

[33] Theories along these lines have been defended by David Braddon-Mitchell (2004), Chalmers (1996, 2002, 2004, forthcoming), Chalmers and Frank Jackson (2001), and Jackson (1998). They argue that there is a distinctively epistemic feature of meaning—a primary intension—that corresponds to functions from epistemic scenarios to truth-values.

[34] See the previous note for a brief characterization of 'primary intension.' Following Chalmers, we can offer the following truth-conditions for belief sentences: '*S* believes that *p*' in *c* iff for all worlds *w* compatible with the exact content of *S* 's belief states at the world of *c*, @, and the time of *c*, *t**, *p* is true at *w*, *t**, and in *c* '*p*' counts as an adequate description of the exact content of *S*'s belief states at @ and *t**.

2.6. ETERNALISM AND BELIEF RETENTION

In the previous sections we have been concerned with defending temporalism against the objection that it is unable to give an adequate account of belief reports and belief retention. As it turns out, however, it is a much greater challenge to come up with an adequate account of how belief is retained over time if the objects of belief are eternal propositions. The problem for the eternalist is that we rarely retain belief for the long term by remembering the same eternal proposition. Presumably when we store a belief about a present occurrence, we store it as a past-tensed proposition. For example, if at 15:13 p.m. on January 5, 2010, I see a red car leave a crime scene, I will likely store the information as a past-tensed proposition; for example, I may store the information in the form *it was the case on that day where I observed the horrible crime that a red car left the crime scene*.

Eternalists cannot account for this way of storing information, because they are committed to the claim that all propositions make reference to a time. They can say that the information I store has the form *there is a time t such that t is prior to or identical to t*, and Brit observes a terrible crime just before t and a red car is leaving the crime scene at t*, where *t** is the time at which the belief information is stored, for example, 3 p.m. on December 14, 2008. But surely this is not the kind of information that is likely to get stored. To store this kind of information the brain would have to be able to track the time precisely at the time of storage. It is just plainly implausible that the brain would have tracking powers like that.

The eternalist may insist that they have a way of dealing with this sort of case. What I store in the hippocampus or the cerebral cortex is not a proposition that refers to a specific time but rather a proposition that quantifies over times. I observe the crime and see the red car escape and then I form the belief that there is a time *t* such that Brit observes a terrible crime just before *t* and sees a red car escape at *t*. While this gets around the problem of how the brain stores information about specific times on the basis of observations of a scene with no clocks, it runs into trouble of a different sort. It implies that when I recall the event, my memory can be true even if I never observed a crime in my life. It could be true if I were to observe a red car escape a crime scene 10 years from now. Our ordinary life experiences tell us that it is unlikely that I falsely remember the details about an event that then occurs in the same way 10 years later. But memories need not be very detailed. If I am told at time *t* that I got an A for my essay about Columbus, this may be all I am able to recall later about the situation in which I learned this fact about the essay. But if my brain stores the information that there is a time at which I get an A for my essay about Columbus, then what I recall could be true, even if the only essay I ever wrote about American history was about Lewis and Clark. It would be true if I were to go back to school later and were to earn an A for my essay about Columbus. Belief information clearly is not stored in memory in this kind of tense-neutral way. Information about the past is stored for the long term in a past-oriented way.

We don't always continue to believe a proposition by storing the information in storage memory. Sometimes we continue to believe something over time without storing the information for the long term. This is the case when we keep information available for immediate use in working memory. For example, if I want to call you, I may look up your phone number in the phonebook. As phonebooks are reliable sources of information, I rationally come to believe that your phone number is, say, 283–1759. I can keep this information available in working memory for the few minutes it takes me to find my phone and dial the number. The information I keep available in working memory for the few minutes it takes me to find my phone and dial the number is hardly indexed to a specific time. I don't continue to believe that your number is 283–1759 by believing that your number is 283–1759 at 15:00 on July 5, 2010, that your number is 283–1759 at 15:01 on July 5, 2010, and so on. The information I keep in mind is just the non-indexed information that your phone number is 283–1759. But while I keep that information available in my mind, I stand in a belief relation to the information. So it is possible to stand in a belief relation to temporal content. This is in conflict with eternalism.

In general, it seems that information can be retained over time in two different ways. One can retain it in the past tense or in the present tense. Information about transient occurrences typically is stored in the past tense, whereas information about things that last longer may be stored in the present tense. Seeing a car leave is a short-lived occurrence, and the information is therefore stored in the past-tense together with temporal markers. Since phone numbers normally do not change very quickly, information about phone numbers may be stored as a present tensed proposition that does not make reference to a time.

The duality in how we retain belief is reflected in the language we use to talk about it. If I say 'Four years ago I believed that John was a firefighter, and I still believe it,' then I can either mean that I still believe that John is a firefighter or that I still believe that he was a firefighter then. But the standard version of eternalism cannot account for duality in the meaning of these sentences. The standard version is required to interpret the second clause as being a time-indexed claim about John four years ago. At best this captures the second reading. The other reading is unaccounted for.

The following examples shed further light on the difficulty the duality in the meaning of these sentences poses for eternalism:

DECEIT

WIFE: When I married John I thought he was a police officer. Thirty years later I still believed he was a police officer. Turns out that he was fired two years into our marriage.

LOST LOVE

FRIEND: Yes, Barbara did love you ten years ago. So you were right back then. But you still believe that she loves you, don't you Peter?

DEFENSE

STUDENT: I think my dissertation is done.

SUPERVISOR: You do? Well, I think you are wrong. Work on it for a few more weeks. Then read it again. If you *still* think that it's done, then we'll talk.

It is important to note here that these cases are about still believing that something is the case rather than believing that something still is the case.[35] So in LOST LOVE, for example, the friend claims that Peter still believes that Barbara loves him. The latter claim is distinct from the claim that Peter believes that Barbara still loves him. The two claims are closely related but only the former suggests that Peter has had the belief that Barbara loves him continuously for an extended period of time. It is the former construction I am interested in here.

Eternalism holds that the objects of our beliefs make reference to a time. In the envisaged example outlined in DECEIPT, the wife's original belief has the propositional content *my husband is a police officer at t*, where *t* is some time thirty years ago. If 'still believes' requires the content of the beliefs to be the same, then the propositional content of the wife's belief after thirty years is *My husband is a police officer at t*.

Likewise, in the envisaged example outlined in LOST LOVE, Peter's original belief has the propositional content *Barbara loves me at t*, where *t* is some time ten years ago. If 'still believes' requires the content of the beliefs to be the same, then the propositional content of Peter's belief after ten years is *Barbara loves me at t*.

Finally, in the envisaged example outlined in DEFENSE, the student's original belief has the propositional content *S's dissertation is done at t*, where *t* is some time of the student and her supervisor's exchange. If 'still believes' requires the content of the beliefs to be the same, then the propositional content of the student's belief after a few weeks is *S's dissertation is done at t*.

But it is hardly the case that the wife in DECEIPT means that she still believed the same time-indexed proposition after thirty years, namely, the proposition *my husband is a police officer at t*, where *t* is some time thirty years ago, that the friend in LOST LOVE means that Peter still believes the proposition *Barbara loves me at t*, where *t* is some time ten years ago, or that the supervisor in DEFENSE is asking the student to return if the student still believes the proposition *S's dissertation is done at t*, where *t* is the time of their exchange. To my mind, such cases raise one of the most pressing kinds of problems for eternalism.

[35] Thanks to an anonymous reviewer here.

It is open to argue that 'S still believes that *p*' doesn't mean that S still believes what she originally believed. The eternalist may take 'still believing' that John is a firefighter to be a matter of holding on to a single persisting belief but updating the representations via which one holds the belief as one moves through time.[36] For example, if S believed that John is a firefighter at t_1, she might now believe that John is a firefighter at t_2. But this concession would weaken the case for eternalism considerably. For, as I argued earlier in this chapter, one of the eternalist's most persuasive arguments against temporalism is that the temporalist must be prepared to give rather liberal paraphrases of 'S still believes it' and 'S still believes that' in some circumstances.

An initially more promising strategy would be to say that we do believe time-indexed propositions but that the times that go into these propositions are time spans (Fitch 1999, Salmon 2003). 'Peter still believes that Barbara loves him' might be true in virtue of the fact that Peter believed that Barbara loves him throughout some extended time interval and still believes that. There are several problems with this strategy. First, 'Barbara loves Peter' is supposed to mean 'Barbara loves Peter throughout an extended time interval. But 'Barbara doesn't love Peter' then is supposed to mean that 'There is some time in the extended time interval during which Barbara doesn't love Peter'. However, if I say 'Peter is wrong. Barbara doesn't love him,' I am not saying that there is some time throughout the relevant time interval at which Barbara doesn't love Peter. I am merely saying that Barbara doesn't love Peter now.

Second, the suggested strategy makes it difficult to account for the validity of the following argument:

> Peter still believes that Barbara loves him.
> It is true that Barbara loves Peter.
> Therefore, Peter believes something that is true.

If 'Peter still believes that Barbara loves him' is true iff Peter believed that Barbara loved him throughout a time interval that lasted 10 years and he still believes that, then the second premise must mean that it is true that Barbara loves Peter throughout a time interval that lasted 10 years. Otherwise the argument isn't valid. But it is difficult to see how the second premise could have this reading, especially given that love is a relatively fleeting relation. I offer further, more detailed arguments against the interval approach in Chapter 3.

There is another challenge to the eternalist in the neighborhood, namely that of providing a realistic account of belief revision. If I learn that John was fired, intuitively I

[36] Thanks to an anonymous reviewer here.

will not simply add one more belief to my belief system; I will dispose of my belief that John *is* a firefighter and add the belief that John *was* a firefighter but is no longer.

But this is not what eternalism gives us. Suppose I believe that John is a firefighter at 3 p.m. on April 5, 2010. If eternalism is true and you inform me that John is not a firefighter at 3 p.m. on August 8, 2010, then this would give me no reason to discard my old belief. After all, I have been given no reason to believe that my old belief is false. If eternalism is true, then all of our beliefs that relate us to present-tensed information are temporally specified in this way. They all contain a time parameter that refers to a specific time. So if they are true at all, then they remain true when the world changes. Contrary to appearances, then, changes in the world give us no reason to revise our original beliefs.

But changes in the world do give us reason to revise our beliefs. If I am told on August 8, 2006 that John has been fired, then there is something I cease to believe: I cease to believe that John *is* a firefighter. The following exchange illustrates this point:

> RANKINGS
> (A and B are talking in the hallway.)
> A: Our department is number two on the Leiter Report!
> (One week later)
> B: What you said last week isn't true anymore. I just saw the rankings.
> A: Of course, it is. Haven't you read Frege? Maybe that's why we dropped.

Eternalism predicts that the proposition A believes on the earlier occasion cannot change it truth-value over time. So A's last remark should be perfectly fine.

It may be replied that 'say' is ambiguous between assert (indirect discourse) and utter (direct discourse). Lewis famously defended this sort of position. Here is Lewis:

> '[W]hat is said' is very far from univocal. It can mean the propositional content, in Stalnaker's sense . . . It can mean the exact words. I suspect it can mean almost anything in between. . . . Kaplan's readers learn to focus on the sense of 'what is said' that he has in mind, ignoring the fact that the same words can be used to make different distinctions. (Lewis 1998 [1980]: 97)

It certainly seems that Lewis is right. If I say 'I am hungry' and you say 'I am hungry,' there is a sense in which we have said the same thing. And it would be very difficult to show that our intuitions track a particular one of the possible readings of 'A and B said the same thing.' However, it is easy to restore the counterexample to eternalism. Simply substitute 'What you thought to be the case last week isn't true anymore. I

just saw the rankings' for 'What you said last week isn't true anymore. I just saw the rankings.'[37]

It may be replied that one shouldn't put too much weight on the significance of the tense in phrases like 'it was true but it isn't anymore,' the reason being that exactly the same kind of example could be used to argue for the conclusion that propositions have truth-values only relative to people, for instance.

A: One hundred fifty is a good bowling score.
B: That may be true for the pros but it isn't true for ordinary folks.

I agree with my objector that the latter example does not show that propositions have truth-values only relative to people. However, the analogy is short-lived. If we remove the word 'anymore,' there is no analogy at all.

2.7. THE ACCIDENT

A final argument against eternalism I would like to consider here is a familiar one.[38] According to the eternalist, the objects of belief are eternal propositions. So 'John believes that Mary is pregnant' is true iff John believes at t^* that Mary is pregnant at t^*, where t^* is the time of speech. But consider now the following case.[39] Mary is pregnant on December 24, 2006 and is expected to give birth on January 15, 2007. But on the morning of December 24, 2006, John and Mary are in a car accident. Mary and the baby are fine. But John is in a coma. Exactly four months later John wakes up and remembers the accident up to his losing consciousness. He believes it is still December 24, 2006 and says: 'Where is Mary? She is pregnant.'

One can truthfully report what John believes using the sentence 'John believes that Mary is pregnant.'[40] But according to the eternalist, 'John believes that Mary is pregnant' is true iff John believes on April 24, 2007 that Mary is pregnant on April 24, 2007. The problem with this analysis, however, is that it is unlikely that John believes that Mary is pregnant on April 24, 2007. For, he believes that it is still December 24, 2006. Eternalism would thus seem to get the truth-conditions wrong.

[37] Or if you prefer: 'What you asserted last week isn't true anymore. I just saw the rankings.'

[38] Versions of it can be found in, for example, Ludlow (1999) and Kusumoto (1999: chap. 1).

[39] The example (with minor changes) is taken from Kusumoto (1999: 62).

[40] Note that one cannot truthfully report what John believes using the sentence 'John believes Mary is pregnant now,' for John doesn't believe that Mary is pregnant on April 24, 2007. So temporalism does not run into the same sort of trouble.

Here is another way of making the same point. Suppose we treat 'John believes that' as a modal operator. 'John believes that *p*' is then true iff for all worlds *w* compatible with what John believes at <@, *t*>, *p* is true at <*w*, *t*>. But John believes (among other things) that no human pregnancy lasts 13 months and that Mary was almost 9 months pregnant on December 24, 2006. So if eternalism is right, then it is true at any relevant world of evaluation that no human pregnancy takes 13 months, that Mary was almost 9 months pregnant on December 24, 2006, and that Mary is pregnant on April 24. That is inconsistent. So, contrary to appearances, John's belief set is inconsistent. I think this argument gives us another strong reason for rejecting eternalism.

It might be thought that the argument can be blocked by treating belief as belief *de se*, as suggested by Lewis (1979). On Lewis' approach, to believe something *de se* is to self-ascribe a property. For example, if John believes that Mary is pregnant, then he self-ascribes the property of being located at a world and a time at which Mary is pregnant.

However, as I argued in a previous section, this approach presupposes that there are temporal propositions. For the extension of 'is located at a world and a time at which Mary is pregnant' is a set of <world, time> pairs at which it is true that Mary is pregnant.

Moreover, if the eternalist rejects the thesis that eternal propositions are objects of possible belief, then her case against temporalism is weakened considerably. For some of the strongest arguments against temporalism conclude that the objects of belief are eternal propositions.

2.8. SIGNPOST

Mark Richard's (1981) umbrella of arguments against temporalism turned on the hypothesis that temporal contents cannot be objects of propositional attitudes because temporal contents are not the kinds of things that get retained when we retain beliefs over time. Suppose temporalism is true, and suppose that back in the 1980s Mary believed that John was a firefighter. Back in the 1980s Mary then stood in the belief relation to the temporal proposition *John is a firefighter*. According to Richard, to retain a belief is to continue to believe the same proposition over time. So, by Richard's preferred account of belief retention, if Mary has retained her original belief, she believes that John is a firefighter. The problem, as formulated, is that Mary may be aware that John has been fired in the meantime.

The solution I offered was to say that there are two ways to retain a belief. One can retain a belief by maintaining a belief relation to one and the same object. But one can also retain a belief, in a secondary sense, by standing in a belief relation to an object that is appropriately related to the original object. If I say 'two years ago I believed John was a firefighter, and I still believe it,' for example, I might mean one of two things. I might mean that I believe that John was a firefighter, or I might mean that I believe that John is a firefighter.

Temporalism is thus able to give an adequate account of belief retention. Eternalism, on the other hand, is not. For example, if I observe a red car escape a crime scene, the eternalist can say that the information I store in the hippocampus or the cerebral cortex is that there is a time t such that t is identical or prior to t^* and Brit observes a terrible crime just before t and sees a red car escape the crime scene at t, where t^* is the specific time at which the belief is stored. But the brain does not have a time tracker to keep track of time before it stores information. It is far more plausible that the information is stored as a past-tensed claim without a reference to a specific time.

Sometimes we retain information by storing it as present-tensed information. For example, if I look up your phone number and continue to believe that your number is 283–1759 for a couple of minutes or days, the information is retained as present-tensed temporal content. Either way, I stand in a belief relation to a temporal content. But this is exactly what the eternalist says I cannot do.

3

DISAGREEING ACROSS TIME

Eternalism holds that present-tensed sentences make implicit reference to the time of speech. 'John is a firefighter,' for example, expresses, relative to a context, the proposition that John is a firefighter at t^*, where t^* is the time of speech. But once we insist that the contents of our utterances refer to a fixed time, it becomes difficult to see how we can have proper agreements and disagreements over extended time periods. So successful communication over time must at least sometimes involve temporal contents. Or so I will argue.

The style of argumentation here is similar to the one used by relativists and nonindexical contextualists to refute more general forms of contextualism. This style of argumentation has received its fair share of criticism, most recently in Cappelen and Hawthorne's *Relativism and Monadic Truth*. This is not the place to engage in the broader debate about whether this form of argumentation can be successfully employed in a refutation of indexical contextualism. Here I will just look at the localized case of eternalism. I reply to Cappelen's and Hawthorne's criticisms pertaining to this localized case below.

One way in which arguments from disagreement presented against eternalism differ from arguments from disagreement presented against indexical contextualism more generally is that the former arguments are specifically directed at the claim that all tensed propositions make reference to specific times. But conversations take place over extended periods of time, and most of these conversations are not about specific times but about some other subject matter altogether. Specific times may be completely irrelevant to what is discussed. So it seems that the information that is passed on and that is the subject of discussion in many cases is temporally neutral. It is thus plausible that conversations that take place over time become real challenges for eternalism even if they provide no real problem for broader indexical contextualist theories.

3.1. PASSING ON INFORMATION ACROSS TIME

To see why the eternalist may have trouble accounting for how information is passed on in ordinary conversations, consider the following exchange:[1]

> FIRED FIREFIGHTER
> (A and B are talking on the phone. B is standing outside the door of an office where a conversation is taking place between John and his superior.)
> A: . . . John is a firefighter.
> (Behind closed door the superior is shouting: 'You are fired!')
> B: I guess you are right. But John is not a firefighter. He was just fired.

The discourse fragment is supposed to sound odd. If you don't have that intuition, the argument does not even get off the grounds. However, most people seem to have the intuition that the discourse fragment sounds odd. But let's look now at the predictions yielded by a standard version of eternalism that takes propositions to make reference to a specific time. On such a version of eternalism, A says that John is a firefighter at t_1, and B then replies that A is right but adds that John is a firefighter at t_2. Notice that there is nothing wrong with the translation I just provided. It doesn't sound odd at all, and for good reasons. If A said that John is a firefighter at t_1, then we should expect B's reply to be acceptable. For it is still true at t_2 that John is a firefighter at t_1.

However, in the envisaged scenario, it would make much more sense for B to have replied: 'No, you are wrong. I am standing outside the superior's office, and the superior just told him that he was fired.'

Note that this argument, as formulated, does not rest on any intuition about whether A asserts a proposition denied by B. Rather, the argument rests on the oddity of the discourse fragment together with a version of eternalism that takes propositions to make reference to specific times.[2] In other words, if FIRED FIREFIGHTER sounds odd, but the eternalist translation does not, then the eternalist translation appears to be mistaken.

[1] It is open to argue that the sentence 'John is a firefighter' *taken out of context* determines a function from <world, time> pairs to truth-values. Moreover, it might be that our talk of what is said often picks up semantic values other than the proposition expressed by the sentence relative to a context. So if you say 'John is a firefighter' at t_1 and I say it at t_2, we can correctly be said to have said the same thing. Our sentences determine the same function from <world, time> pairs to truth-values. Similarly, if I say 'I am hungry' and you say it too, we can be said to have said the same thing. However, this reply does not address the problem of agreement and disagreement. For if I say 'I am hungry' and you say it too, then we are not agreeing. Similarly, if you say 'John is a firefighter' at t_1 and I say it at t_2, then we are not agreeing (if eternalism is right).

[2] Thanks to an anonymous reviewer here.

Let me consider some possible replies to this argument. First, it may be countered that FIRED FIREFIGHTER, besides being extremely unnatural-sounding, is also very unusual. We do not ordinarily happen to receive new evidence in the middle of an on-going dialogue.

This sort of reply is unsuccessful, however. For the problem which FIRED FIREFIGHTER calls to our attention is a general one. When I say 'John is a firefighter' and you say in response to me 'Nuh-uh, John is not a firefighter. He is a police officer,' it is hard to deny that we are disagreeing about something. The disagreement is, prima facie, as genuine and nonverbal as could be. But if eternalism is right, then the disagreement is merely verbal. For when I say 'John is a firefighter' at t_1, I am saying that at t_1 John is a firefighter, and when you say 'John is not a firefighter' at t_2, you are saying that at t_2 John is not a firefighter. But *at t_1 John is a firefighter*' and *at t_2 John is not a firefighter* can easily be asserted together without any infelicity. I take this to be a serious problem for eternalism of any stripe.

Second, a critic may rejoin that the argument affects only versions of eternalism that takes propositions to make reference to specific times. However, we can imagine other versions of eternalism. On one version, the semantic value of the hidden indexical variable in 'John is a firefighter' is not always the time of speech (Salmon 1986: 39f) but can be fixed more freely by the conversational context.

Compare the case of the present tense to that of a context-sensitive expression like 'local' or 'nearby.' 'John went to a local bar' need not be interpreted as 'John went to a bar that is local to the speaker,' but may be interpreted as 'John went to a bar that is local to John,' 'John went to a bar that is local to the hearer,' 'John went to a bar that is local to his grandmother,' and so on, depending on the conversational context.[3] In this case, the speaker can more or less freely fix the value of the hidden indexical variable associated with 'local.' Perhaps the same goes for 'John is a firefighter.'

I think, however, that this version of eternalism is even less plausible than the original. Consider the following dialogue between A and B:

AS I SAID
A: What does John do for a living?
B: He is a firefighter.
C: Nuh-uh, he was fired two years [weeks/days/minutes] ago. He is a lawyer now.
B: [Aggravated] So, as I said, John is a firefighter.

Regardless of whether we substitute 'two weeks,' 'two days,' or 'two minutes' for 'two years' in the third sentence, B's last remark sounds awkward. If, however, B can freely

[3] François Recanati (2004, 2007) and Anne Bezuidenhout (2003, 2005) call expressions that function in this way 'perspectivals.'

choose which time his assertions refer to, then we should expect B's remark to be felicitous, or at least have a reading that would render it acceptable.

Further contextual constraints may perhaps be invoked to explain why B's last remark is unacceptable. But I have a further worry about the view in question: There is a clear disanalogy between the case of the present tense and the case of 'local.' Consider an analogous conversation involving 'local':

LOCAL
A: Where is John?
B: He is at a local bar.
C: Nuh-uh, he left St. Louis two hours ago. He is in Boston now.
B: [Aggravated] So, as I said, John is at a local bar.

In this case, we can at least find an interpretation that makes B's response acceptable. For example, we can add to B's last remark 'What I meant, of course, was that John is at a local bar in Boston.' That would render the discourse fragment felicitous. But there is no similar way of continuing B's last remark in AS I SAID that would render that fragment felicitous. We cannot add 'What I meant, of course, was that John *is* a firefighter at t_1' or 'What I meant, of course, was that John *was* a firefighter at t_1,' where t_1 refers to a time at which John was a firefighter. That would not make B's last remark less odd.

Third, it may be objected that we have wrongly assumed that the proposition that John is a firefighter contains a specific time. If the 'times' that go into propositions are extended periods/intervals, the infelicity is easily explained. According to Fitch (1999: 156) and Salmon (2003: 116), the time that enters the proposition may be a fairly long interval/period of time—a week, a month, a year, or even longer. The size of t (and hence the context itself) depends to some extent on the speaker's intention and/or on the sentence uttered. Since being a firefighter is a relatively stable property (unlike, say, reading), the interval in question with regard to an utterance of 'John is a firefighter' tends to be fairly long, certainly longer than the utterance itself.

However, this approach runs into a number of difficulties. Suppose for the sake of argument that the proposition expressed by 'John is a firefighter,' relative to a context—call it p—contains today as a constituent. What are the metalinguistic truth-conditions for p? Suppose p is true iff John is a firefighter at every time today. Then 'John is not a firefighter' might mean 'there is some time today at which John is not a firefighter.' So the following sentences might come out true:

#John is a firefighter as I am speaking but he is not a firefighter.
#It is 3 p.m. June 14, 2006 (CST), and John is a firefighter at 3 p.m. June 14, 2006 (CST) but he is not a firefighter.

But these sentences are clearly infelicitous. A related problem with the Fitch/Salmon approach is that it succumbs to the difficulties it purports to overcome. For suppose you utter 'John is a firefighter' with the intention of expressing the proposition that John is a firefighter today. What you said is then true iff John is a firefighter at every time today. But now suppose I say 'John is not a firefighter' in dispute of your claim. Since *ex hypothesi* I am denying what you asserted, my claim is true iff there is some time today at which John is not a firefighter. But clearly that is not the right truth-condition for 'John is not a firefighter.' Even if John is going to retire tonight, 'John is not a firefighter' isn't true when uttered in the afternoon.

It may be replied that interval semantics is to be understood slightly differently. The truth conditions of 'John is a firefighter' when present tense gets assigned an interval *i*, come out requiring John to be a firefighter during *i*. But, it may be said, this does not reduce to requiring John to be a firefighter at every moment during *i*. One could hold that the intervals must be taken as basic. Of course, an account has to be given of what it is to be an F during an interval. Here one might say that this will vary with different Fs. For example, for 'John is hopping' to be true relative to an interval probably requires hopping throughout the interval. But for 'John is building a house' to be true relative to an interval allows non-building to occur in the interval.[4]

How is this relevant to the firefighter case? Well, normally, when we say 'John is a firefighter' there is an expectation that the interval assigned to *present* stretches at least to some extent into the future. So if I say 'John is a firefighter,' and he is immediately fired, there is reason to think that what I said is false, which would explain why A's reply in FIRED FIREFIGHTER is odd. Notice further that if we defeat the expectation that the interval stretches into the future, the sort of exchange we considered above sounds better:

FIRED AGAIN
A: Tell me, what is John's profession at this precise instant?
B: John is a firefighter.
[Superior: 'You're fired!']
A: I guess you are right. But John is not a firefighter anymore.

I think this account of the time intervals that enter into the eternalist's propositions marks a considerable improvement on the simple interval account I considered above. However, I still have some worries about it.

[4] Though I won't push this line here, I suspect that it is going to be difficult to give an account of what it is to be an F during an interval. There is too much pragmatic flexibility in the language for such an account to be even approximately correct. For example, normally when we say 'the sunflower is five meters long' there is an expectation that the interval assigned to *present* stretches at least to some extent into the future. But if we are looking at a fast-growing sunflower, there may be no such expectation. Thanks to Jeff King for discussion here.

For one thing, while FIRED AGAIN sounds better than FIRED FIREFIGHTER, it still sounds awkward to my ears. It would be fine if A had said 'you *were* right,' but 'you *are* right' sounds at least slightly awkward.

For another, it is still not clear how a defender of this view would account for disagreement. If I say: 'John is a firefighter,' and you reply, 'no, he is not,' then what I said is true iff John is a firefighter throughout an interval that stretches into the future. So if you are disagreeing with me, then what you are saying is true iff it is not the case that John is a firefighter throughout an interval that stretches into the future. So you could be right if John is a firefighter as we are speaking but is fired later today. That seems no less problematic. What's more: We still get the unwelcome implication that 'John is a firefighter as I am speaking, but John is not a firefighter' could come out true.

Exactly the same point extends to disagreements involving past- and future-tensed sentences. I might say at t_1: 'I guess John didn't get fired after all' and you might say two hours later at t_2: 'No, you were wrong. John did get fired. I just talked to his boss.' But if we assume a version of eternalism that takes propositions to make reference to specific times, then what I said was that relative to t_1, John didn't get fired, and what you said two hours later was that relative to t_2, John did get fired. Contrary to appearances, there is no disagreement here.[5]

If we assume a version of eternalism that takes the times that go into the propositions to be intervals, then 'John got fired' is true iff 'there is an extended interval *i* that includes the time of speech and John got fired at some time before *i*.' So if you say 'John got fired' and I say 'John didn't get fired' in dispute of your claim, then what I said is true iff it is not the case that there is an extended interval *i* that includes the time of speech, such that John got fired at some time before *i*. So the following sentence could come out true: 'It is the case as I am speaking that John got fired but John didn't get fired.' But the latter certainly looks like a contradiction.

Before moving onto how temporalism accounts for agreement and disagreement over time, let us consider one more response to FIRED FIREFIGHTER on behalf of the eternalist. For most people, there is no question that FIRED FIREFIGHTER sounds odd. However, the eternalist could insist that the discourse fragment sounds odd because it involves some kind of verbal disagreement. Consider the following case of apparent disagreement:[6]

[5] Notice that the problem does not go away if one requires (with Salmon 1989) that past-tensed operators be contextually restricted. For I might say 'John didn't get fired earlier today' and you might say two hours later: 'You were wrong. John did get fired earlier today.' If the time of speech is a constituent of the proposition expressed, then there is no real disagreement here.

[6] Thanks to David Chalmers for offering this example.

HAIR SPLITTING

A: It's exactly 4 a.m.

B: (Five minutes later.) What you said is false. It's not exactly 4 a.m.—it's five minutes later.

B's reply sounds awkward because she makes as if to disagree with A ('What you said is false . . . it's five minutes later' than 4 a.m.) when in fact *five minutes ago it was exactly 4 a.m.* is perfectly consistent with *it is five minutes later than 4 a.m.*

The eternalist could say that FIRED FIREFIGHTER is like HAIR SPLITTING in this respect: It is a case where B makes as if to agree with A when in fact he disagrees with A. Upon further scrutiny, however, this sort of response does not hold up. After all, the eternalist translation of FIRED FIREFIGHTER is not a case in which someone makes as if to agree or disagree with someone else. In the eternalist translation there is no disagreement, be it real or verbal.

Furthermore, if the problems raised by the above cases were similar to the problem displayed by HAIR SPLITTING, then we should expect the following analogous exchange to be infelicitous too:

C: John is a firefighter.

D: (Five minutes later. John has *just* been fired.) What you said is false. John is not a firefighter—he was *just* fired.

If the eternalist is right, then C is saying that at t_1 John is a firefighter, and D is saying that at t_2 John is not a firefighter. So D's reply ought to sound as awkward as B's reply: 'No, it's not exactly 4 a.m.' But it clearly doesn't.

Frege is famous for having argued that the possibility of agreement and disagreement requires Fregean thoughts, or what we have called 'eternal propositions.' The objects of agreement and disagreement, of statements, judgments, promises, beliefs, and so on, are eternal propositions. As Stalnaker elegantly puts it:

> The independent interest in propositions comes from the fact that they are the objects of illocutionary acts and propositional attitudes. A proposition is supposed to be the common content of statements, judgements, promises, wishes and wants, questions and answers, things that are possible or probable. (1970: 278)

But if eternal propositions are the objects of possible belief and what is asserted by a sentence, then it seems that genuine agreement or disagreement, or the sharing of content in general, is severely limited.

It is ironic that the very thing that motivated Fregean thoughts, namely the possibility of agreement and disagreement—the possibility of shared content—is also the very thing that the Fregean theory of propositions has the most trouble accommodating.

3.2. ARGUMENTS FROM DISAGREEMENT AGAINST TEMPORALISM

Some thinkers have attempted to level arguments against temporalism that superficially resemble the arguments just presented against eternalism. A quick look at these arguments is in order.

One argument runs as follows: It is initially plausible that if a proposition A and a proposition B have different truth-values, then A and B cannot be identical.[7] If, for example, John F. Kennedy truly believes on January 15, 1961, that the White House is white, and George W. Bush falsely believes on May 1, 2006, that the White House is white, because the White House was painted red the previous day, then the objects of Kennedy's and Bush's beliefs have different truth-values. If, however, the objects of Kennedy's and Bush's beliefs have different truth-values, then the objects of their beliefs cannot be one and the same proposition. Temporalism holds that the propositions believed by Kennedy and Bush determine functions from worlds and times to truth-values. So temporalism, it seems, wrongly predicts that Bush and Kennedy believe the same thing.

However, this argument rests on a mistake. More precisely, it rests on one of the following dicta:

> Same proposition, same truth-value.
> Same proposition, same actual truth-value.

But the first dictum is false. For a proposition may have different truth-values at different worlds. For example, the proposition that the White House is white on January 15, 1961, is true at the actual world but false at a nearby world in which the White House was painted red. The second dictum entails that propositions cannot change their truth-values across time; hence, it is just a restatement of eternalism, and as such begs the question against temporalism.

There is, however, an improved version of the above argument. Kennedy truly believes on January 15, 1961, that the White House is white and George W. Bush truly believes on May 1, 2006, that the White House is not white. The White House was painted red the previous day. Temporalism would thus have us believe that the presidents disagree; after all, the one affirms what the other denies, namely, the temporal proposition that

[7] Formulations of this argument can be found in Cartwright (1966: 92), Stanley (1997a: 575) and McGrath (2006: 7).

the White House is white. But as both presidents believe something true, they clearly do not genuinely disagree. Or so the argument goes.

The argument does not succeed. Consider an analogous argument against eternalism. Bill Clinton truly believes that on May 1, 2006, in the actual world that the White House is white, and Ronald Regan truly believes on May 1, 2006, in some non-actual world that the White House is not white. The White House in the non-actual world was painted red the previous day. Eternalism would thus have us believe that the politicians disagree; after all, the one affirms what the other denies, namely, the eternal proposition that the White House is white on May 1, 2006. But—to mimic our opponent—as both politicians believe something true, they clearly do not genuinely disagree.

The argument is unsound; it equivocates on the notion of disagreement. Clinton and Reagan disagree in the sense that one affirms what the other denies. But they do not disagree in the sense that one of them is denying that the proposition expressed by the other is true. The same holds for Bush and Kennedy. Bush and Kennedy disagree in the first sense but not in the second.[8]

Another version of the argument from disagreement can be found in François Recanati (2007: chap. 11). It runs as follows: Suppose 'at time t_1, you say "it's raining." Later, when the sun's shining, you say "It's not raining". You cannot conclude "So I was

[8] Here is another argument:

> (1) Kennedy stands in the three-place relation *truly believes* to the proposition that the White House is white and the time 1961, whereas Bush stands in the three-place relation *truly believes* to the proposition that the White House is white and the time 2004.
> For simplicity, let us assume that the temporalist is also a perdurantist. Then she will claim that
> (2) A part of Kennedy, Kennedy*, is located at 1961 and truly believes that the White House is white; whereas as part of Bush, Bush*, is located at 2004 and falsely believes that the White House is white.

It follows from (2) that

> (3) Kennedy* truly believes the White House is white, and Bush* falsely believes that the White House is white.

The following schema is extremely plausible:

> (P) If X truly [falesly] believes that p, then p [not p].

Applying this schema to (3) we get

> (4) The White House is white, and it is not the case that the White House is white.

But (4) is false. Hence (1) is also false, and the temporalist is refuted. Or so it seems. However, I think that schema (P) is suspect. Here is a more plausible schema for the perdurantist: If X truly believes that p at *t*, then p at *t*. Thanks to Dan Marshall for discussion here.

wrong."' Recanati takes this to show that disagreements cannot be about temporally neutral contents.

However, I think no such thing follows. 'I was wrong' means roughly 'What I asserted on the earlier occasion *was* false.' But there is nothing in the discourse context of Recanati's example to indicate that you have changed your mind about the truth-value of your earlier claim.

Before continuing let me briefly say what I think motivates the sorts of objections to temporalism that we have just encountered. I think the objections originate in a tendency to render the following claim true:

> Uninteresting Disagreement
> A and B disagree if A asserted something that B denied.

However, this claim is either uninteresting or false. To disagree in an interesting sense A and B must be part of the same conversational context. So in what sense do A and B disagree in a conversation in which A says at t_1 'It's raining' and B says at t_2 'No, you are wrong. It's not raining'? In the following sense: B takes the proposition, expressed by A at t_1, to be false at t_2. This is why B starts off with 'No, you're wrong.' Of course, A may no longer be inclined to regard the proposition as true at t_2. But if she is still so inclined, then A and B are in disagreement: At t_2 they take the proposition *it is raining* to have different truth-values.[9]

In their monograph *Relativism and Monadic Truth* Cappelen and Hawthorne provide evidence against disagreement data and argue that the best test for whether an expression is context-sensitive or not is one that gives 'center stage to the verbs 'agree' and "disagree"' (2009: 54). The test can be illustrated by means of an example. If A says 'Mary has had enough. She has had three slices of cakes' and B says 'Mary has had enough. She is going to leave her husband,' then we cannot correctly infer 'A and B agree that Mary has had enough.' The oddity of the agreement report is supposed to show that 'had enough' is context sensitive. It has different meanings in different contexts.

The reason the test works as a true test of shared content, Cappelen and Hawthorne say, is that it is hard to hear 'agree' in 'agree' reports as distributive. Cappelen and Hawthorne then argue that the test shows that propositions are not temporally neutral. Here is one of their examples. John says 'Bill has died' in response to the question 'Why

[9] Because genuine disagreement must take place at the same circumstance of evaluation, relativists have trouble accounting for genuine disagreement. If I say 'this chili is tasty' and you say 'this chili is not tasty,' then there is no single circumstance of evaluation with respect to which what I said has the opposite truth-value of what you said. See, however, MacFarlane (2007b).

did Bill not show up at the pub last week?' And Janet says 'Bill hasn't died' in answer to the question 'Why did Bill's children not get their inheritance last year?' They conclude that 'The claim 'Janet and John disagreed about whether Bill had died' is clearly infelicitous' (2009: 98).

It is incorrect to say that the report is clearly infelicitous. The report seems perfectly grammatically acceptable but it sounds false. That aside, the test fails. For disagreement to take place it is not sufficient that one speaker denies something that another speaker asserts. Interesting disagreement requires that there is a time at which two speakers are in the same conversational context and are prepared to assign different truth-values to the same content. In the envisaged scenario, John and Janet are not in the same conversational context. So they don't disagree in any interesting sense. Hence, the disagreement report is false.

Consider the following modified example: John and Janet are having a dispute about whether Bill has died. John says: 'Bill has died. He didn't show up at the pub last week.' Janet replies: 'No, Bill hasn't died. His children didn't get their inheritance.' Given this conversational context, the disagree report 'Janet and John disagree about whether Bill has died' comes out true.

Cappelen and Hawthorne argue that 'debated' has the same properties as 'agree' and can be equally suitable for testing for context-sensitivity (2009: 57). Substituting 'debated' for 'agreed,' however, gives us the same results. 'Janet and John debated whether Bill had died' is false in the first case and true in the second.

To further see that the disagreement test fails, consider the following example. John says 'Bill died at 2 p.m., December 11, 2010 (CST)' in response to his drinking buddy's question 'Why did Bill not show up at the pub last week?' And Janet says 'Bill didn't die at 2 p.m., December 11, 2010 (CST)' in response to her husband's question 'why didn't Susan win the bet?' Here the claim 'Janet and John disagreed about/debated whether Bill died at 2 p.m., December 11, 2010 (CST)' is clearly false, despite the fact that Janet denies what Bill asserts. This becomes even more apparent if we make the innocent move of substituting 'had a disagreement about' for 'disagreed about.' Janet and John did not have a disagreement about anything. But we cannot take that to mean that 'Bill died at 2 p.m., December 11, 2010 (CST)' has different meanings in different contexts.

3.3. SIGNPOST

As eternalists take propositions to make reference to a specific time, it is difficult to see how they will account for disagreements that take place over time. Specific times often are irrelevant to those disagreements. What is conveyed and passed on in conversations are temporal contents. Those are the ones we typically address and respond to.

Disagreement poses no similar problem for temporalism. When A says 'John is a firefighter' and B says 'You are wrong. John is not a firefighter,' there is a particular content that A and B are discussing, namely, the temporal content that John is a firefighter. The specific time at which each of them is talking is irrelevant to the information that is passed back and forth. It is also irrelevant to whether they disagree or not. If the disagreement is genuine, then the two speakers are prepared to assign different truth-values to the proposition they are discussing at any time throughout their disagreement.

4

REPRESENTING TIME

In a recent influential paper, Jeff King offers empirical evidence against the assumption that there are tense operators in English.[1, 2] King's claim is not that temporal prefixes, such as 'it was the case that' and 'it will be the case that,' do not belong to English, or that 'it was the case that John is a firefighter' is not an English sentence. Rather, King's suggestion concerns the underlying syntax or logical form (in the Chomskian sense) of such sentences,[3] and hence also the interpretation of the logical forms (the 'propositions expressed' in philosophical terminology). King thinks that the metalinguistic truth-conditions for tensed sentences offered by eternalists are to serve as representations of the logical form of these sentences as well. A sentence like 'John was a firefighter' thus contains the quantified noun phrase 'some past time' rather than the past-tense operator 'it was the case that' at the level of logical form. Here I will outline why this argument is potentially troublesome for the temporalist and propose a solution.

4.1. TEMPORALISM AND THE TIME ANALYSIS

While it is not framed that way, King's argument is first and foremost an argument against temporalism. According to King, empirical evidence shows that the English tenses function semantically as object-language quantifiers. At first glance, the suggestion that tenses are quantifiers may seem compatible with temporalism. The temporalist also utilizes quantification over times in her metalinguistic formulations

[1] King (2003) also offers empirical evidence against the assumption that there are location operators (e.g., 'in N.Y') in English. I think that he is right to think that there aren't any locations operators in English. Expressions such as 'in N.Y,' 'two miles from D.C.,' 'here,' 'somewhere,' and so on, are adverbial phrases, and adverbial phrases do not have the semantic properties one should expect if they were operators (see below).

[2] See also G. Massey (1969), Johan van Bentham (1977), Terence Parsons (1990), Friederike Moltmann (1991, 1997), Hans Kamp and Uwe Reyle (1993), Kiyomi Kusumoto (1999), Antony Galton (2003) and Richard Larson (2003). For a survey of the literature on events see Pianesi and Varzi (2000).

[3] In linguistic theory, 'logical form' (LF) refers to a level of syntactic representation at which the scope interactions of quantified noun phrases is unequivocal.

of the truth-conditions for tensed sentences. So it may seem that one could remain a temporalist and yet grant that King is right in thinking that the tenses are quantifiers. That is not so given the formulations of temporalism offered in Chapter 1. Temporalism, as we formulated it, is committed to the following two theses:

> *Content Invariance*: Some sentences lacking time adverbials (e.g., 'John is a firefighter') express the same content at different times.
> *Truth Variance*: Some of our utterances have contents that have different truth-values at different times.

If, however, the tenses function semantically as object-language quantifiers, then both of these theses are false. Consider, for instance, the following sentences:

(1) John is a firefighter.
(2) John was a firefighter.
(3) John will be a firefighter.

The temporalist—recall—offers the following metalinguistic formulations of the truth-conditions for the sentences in (1)–(3):

(1a) John is a firefighter at t^*.
(2a) $\exists t(t < t^*$ & John is a firefighter at $t)$
(3a) $\exists t(t^* < t$ & John is a firefighter at $t)$

Sentence (1a) says that John is a firefighter at the time of speech, (2a) says that there is a time *t* such that *t* is earlier than the time of speech, and John is a firefighter at *t*, and (3a) says that there is a time *t* such that the time of speech is earlier than *t*, and John is a firefighter at *t*. If we took (1a)–(3a) to represent the propositions expressed by the sentences in (1)–(3), then the propositions expressed by (1)–(3) would not be temporal propositions. For the contents expressed, relative to a context of use, by (1a)–(3a) do not change their truth-values over time. *John is a firefighter at t**, for example, has the same truth-value regardless of when it is evaluated. So the suggestion that the tenses are quantifiers is incompatible with temporalism, as we formulated it above. King's proposal is a version of eternalism.

It may be thought temporalism is compatible with a quantifier treatment of the tenses. For example, it may be urged that 'John was a firefighter' is to be interpreted as (A) '$\exists t[t < t_n$ & John is a firefighter at $t]$,' where t_n is an unbound variable. The latter, one could argue, is temporally neutral because it expresses a proposition that is true at $<w_1, t_1>$ (if John is a firefighter at some time before t_1) but false at $<w_1, t_o>$ (if John is not a firefighter at any time before t_o).

However, (A) cannot be a proposition expressed by 'John was a firefighter.' For (A) contains an unbound variable that needs completion by context, namely 't_n' (it needs completion by context because it is unbound). Propositions (as standardly construed on a Kaplanian or Russellian account) cannot have unbound variables in them. Propositional structures with unbound variables are propositional functions, not propositions. So for 'John was a soldier' to express a proposition the free variable in (A) would need to be completed by context. And once it is completed by context, the proposition expressed is: $\exists t[t < t^*$ & John is a firefighter at $t]$, where t^* is the time of utterance. So it is not an option for the temporalist to take 'John was a firefighter' to express the propositional structure indicated in (A). Temporalism requires a treatment of the tenses as operators.

But if temporalism requires a treatment of the tenses as operators, then King's arguments against the operator treatment can be construed as arguments against temporalism.

4.2. THE EVENT ANALYSIS

There is an alternative quantificational account to be found in the recent philosophical literature. On this account, the tenses are relations between events.[4] The simple past tense, for example, is a relation between a given speech act and a past event, and the simple future tense is a relation between a given speech act and a future event. Higginbotham (2002), for example, assigns the following logical forms to (1)–(3):[5]

(1b) $\exists e(e \approx u$ & John being a firefighter $(e))$
(2b) $\exists e(e < u$ & John being a firefighter $(e))$
(3b) $\exists e(u < e$ & John being a firefighter $(e))$

where e_i are event variables, u is an utterance of the sentence in question, '$\approx$' means 'is simultaneous with', and '$<$' means 'is prior to'. (1b) says that there is a *John being a firefighter* event that is simultaneous with this very utterance, (2b) says that there is a *John being a firefighter* event that is prior to this very utterance, and (3b) says that this very utterance is prior to some *John being a firefighter* event.[6]

[4] For an event account of tensed discourse, see also Parsons (1990).

[5] Higginbotham uses a different notation that makes explicit that it is the verb that is indexed to events—for example, in 'John went to Utah' 'go' has two argument positions one of which is an event position, and the adjunct 'to Utah' is the predicate of the event position (2002: 210). But these details do not matter for our purposes.

[6] Higginbotham's events could be treated as Kimian events (Kim 1969), that is, as complexes of objects and properties. As Andy Egan (2006) points out, such a treatment might be extended to account for adverbs of quantification. Lewis argues that adverbs of quantification are unselective quantifiers over cases, where cases are 'values of the variables that occur free in the open formulas

The quantificational account and the event analysis are strikingly similar. Where the quantificational account treats the tenses as object-language quantifiers over times, the event analysis treats them as object-language quantifiers over events. On both analyses, tensed sentences contain implicit indexical variables whose values are times or events. Moreover, defenders of both treatments think that the broad rationale for treating the English tenses as object-language quantifiers is that such a treatment is supported by empirical evidence. Traditional tense logic is simply unable to account for even the most basic constructions in English and other languages. As Higginbotham puts it:

> An important tradition, identified first of all with the work of Arthur Prior (1957, 1967), but continuing to the present day, has examined and elaborated the view that the tenses are operators, and truth relative to time. This view gains prima facie plausibility from the fact that the tenses, whether inflectional or periphrastic, do not occupy quantifiable places. Of course, we have reference to times in elementary language: 'He went there at that time', 'After some not too distant time I shall return to London', and so forth. But the thought is that there is a fundamental part of our language whose logical syntax does not involve quantification over times, even if, in the metalanguage, the action of the tenses is explained in terms of quantification. The tenses then become a species of modality. Model-theoretic studies, including Dowty (1982) and much later work, assumed this point of view. However, an important result of the research of recent years is that the modal theory of the tenses is inadequate: there is no basic part of our language for which it is correct. The reason is that modal theories are unable to express temporal cross-reference. (2002: 209–10)

Similar remarks by King make essentially the same point about the English tenses:

> It is important to be clear at the outset that the claim that tenses are operators that shift features of the index of evaluation is an empirical claim about natural language. It is a claim to the effect that in the best syntax and semantics for natural language, tenses will be treated syntactically and semantically as such operators. I

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modified by the adverb' (1975: 10). But this account runs into trouble with cases like 'a farmer who owns a donkey is usually rich,' 'someone who graduates from MIT is usually smart' and 'a student who procrastinates usually fails.' The problems disappear if we take adverbs to quantify over Kimian events. 'A farmer who owns a donkey is usually rich' would then mean that most donkey-owning by a farmer events are such that the farmer in that event is rich, 'someone who graduates from MIT is usually smart' would mean that most MIT graduation events involves someone smart, and 'a student who procrastinates is usually smart' would mean that all instantiations of procrastinating studenthood fail, or (on a different reading) that most classes *x* teaches are such that a student who procrastinates in that class fails.

> shall argue that given the available evidence, this is an implausible empirical claim. (2003: 215)

King also notes that advocates of a quantificational analysis of the tenses are in good company, for many tense logicians have already given up on the tense operator treatment of the tenses and temporal prefixes.[7]

The defenders of the quantificational account and the event analysis appeal to essentially the same pieces of evidence to motivate their rejection of traditional tense logic, for example, temporal anaphora. In what follows I shall focus on the evidence presented by King. After having presented the case against a treatment of the tenses as sentential operators I will provide the essentials for a philosophy of tense that overcomes the chief problems for traditional tense logic.

4.3. THE EMPIRICAL EVIDENCE AGAINST TRADITIONAL TENSE LOGIC

According to King, not only is there scanty grammatical evidence for a standard tense operator treatment of the tenses, there seems to be considerable evidence against it. King offers three main pieces of evidence to motivate a shift to the quantifier approach. One consideration against the standard treatment is that it gives us the wrong truth-conditions for sentences with time adverbials. Consider, for instance (King 2003: 216; Dowty 1982: 23):

(4) Yesterday, John turned off the stove

According to King, Prior-style tense logic would treat (4) as containing two operators, namely the simple past tense, and the operator 'yesterday.'[8] Y shifts the time of speech to some time yesterday, and P shifts the time of evaluation t^* to some time t such that t is earlier than t^*. Since (4) contains two operators, says King, it should have the following two readings (where, following King, Y is a 'yesterday' operator, and P is the past tense operator):

(4a) Y(P(John turns off the stove)
(4b) P(Y(John turns off the stove)

But (4a) and (4b) do not give us the correct readings for (4). Whereas (4a) is true iff John turns off the stove the day preceding some past time, (4b) is true iff John turns off

[7] King mentions work by Enç (1987), Parsons (1990), Ogihara (1996), Abusch (1997), and Higginbotham (2002).

[8] See also Kamp (1968).

the stove at some time past of yesterday. So (4a) and (4b) may both be true if John turned off the stove ten days ago; but (4) would be false. Thus, a Prior-style tense logic simply yields the wrong truth-conditions for sentences like (4).

King's quantificational analysis fares much better. On King's analysis (4) cashes out to: There is a past time *t* such that *t* was some time yesterday and John turns on the stove at *t*.

The second reason King offers against a treatment of the tenses as sentential operators is that it would make the wrong predictions in cases like the following (2003: 217):[9]

(5) Sheila had a party last Friday, and Sam got drunk.

As Barbara Partee (2004) has made vivid, the English tenses can be anaphoric on other tenses in much the same way that pronouns can be anaphoric on quantifiers or terms. The idea is that (5) is similar in important respects to:

(6) Sam took the car yesterday, and Sheila took it today.

In the case of (6), the pronoun 'it' in the second clause is anaphoric on 'the car' in the first sentence. On one theory of unbound anaphora, defended by Stephen Neale (1990) and others,[10] unbound anaphoric pronouns go proxy for definite descriptions recoverable from the antecedent clause. The 'it' in 'Sheila took it today,' for example, goes proxy for the definite description 'the car Sam took yesterday.' Likewise, in (5) the past tense of the first clause picks out a time interval that is supposed to fall within the time interval picked out by 'last Friday.' The past tense of the second clause is anaphoric on the interval picked out by the past tense of the first sentence. The second clause is thus interpreted as meaning that Sam got drunk at Sheila's party last Friday.

The same phenomenon occurs with locatives such as 'when Susan walked in' or 'when my students handed in their papers' (Partee 2004: 53). Consider, for instance:

(7) When Susan walked in, Peter left.

The past tense of the consequent is anaphoric on the time picked out by the antecedent clause: Peter left at the time at which Susan walked in.

Faced with this sort of evidence Partee suggests that the English tenses behave semantically as pronouns. Pronouns can occur deictically (as in 'he [pointing] is smart'),

[9] This and the subsequent examples are from Partee (1994: 53).

[10] Parsons (1978), Cooper (1979), Davies (1981), Lappin (1989), Heim (1990), Ludlow (1999: chap. 8), van Rooy (2001) and Abbott (2002). Abbott takes the pronouns to go proxy for demonstratives.

anaphorically (as in [6]), and as bound variables (as in 'every man thinks Mary loves him'). Partee later partially retracted her claim (1984: 276), mainly because it appears that the semantic import of some unembedded occurrences of the past and future tenses is just existential quantification (as in 'Jim once bought a bike' or 'people will inhabit the moon'). In chapter 5 we will look at a further reason to reject the hypothesis that the tenses function semantically as pronouns. The tenses-as-pronouns thesis yields the wrong truth-conditions for sentences like 'if you were king, you would cut off the head of everyone who offended you.'

Even if the tenses do not always behave semantically as pronouns, however, it is an undeniable fact that the tenses can be anaphoric on each other. But this sort of phenomenon poses a challenge to theories that treat the tenses as sentential operators. Consider again:

(5) Sheila had a party last Friday, and Sam got drunk.

The problem for theories that treat the tenses as sentential operators is that if 'last Friday' and the past tense of the first clause are treated as independent operators, then the second conjunct in (5) receives the implausible interpretation that Sam got drunk at some time in the past, which—if Sam is like most of us—is obviously true. Again, a treatment of the tenses as sentential operators seems to yield the wrong truth-conditions.

According to King, a more debilitating problem for theories that treat the tenses as operators is that they are unable to give a convincing account of Kamp/Vlach sentences such as:

(8) One day, all persons alive now will be dead.
(9) Once all persons alive then would be dead.

The problem posed by such sentences is that they have no satisfactory paraphrase using only the resources of traditional Priorian tense logic. In Priorian tense logic the future tense operator, when unembedded, shifts the time of evaluation from the present time to some time in the future. Anything that occurs within the scope of the future tense operator is evaluated with respect to that time, which makes it difficult to translate (8). A different problem is presented by (9). The problem here is that the past evaluation time is lost when the future evaluation time is introduced. To translate (8) and (9), King says, we need to introduce something like Hans Kamp's (1971) doubly indexed N operator, and Frank Vlach's (1973) doubly indexed K operator.

Kamp's N operator shifts the time of evaluation for the sentence it embeds to the time of reference (which may or may not be the time of speech). Vlach's K operator is used

in combination with the N operator. The K operator stores the time introduced by a past tense operator that embeds it, and the N operator is used to retrieve the stored time.

Where P is the past tense operator, F is the future tense operator, N is Kamp's N operator, and K is Vlach's K operator, (8) and (9) can be paraphrased as follows (King 2003: 222; van Bentham 1977: 416; Vlach 1973):

(8Oa) F(All persons x: (N(Ax) → Dx))
(9Oa) P K F (All persons x: (N(Ax) → Dx))

In (8Oa) the N operator shifts the future evaluation time to the time of speech. In (9Oa) the K operator is used to store the past time at which the people in question were alive, and the N operator then retrieves the stored time.[11]

King acknowledges that the suggested paraphrases of (8) and (9) have the same truth-conditions as the original. But he thinks they are unwieldy and ad hoc. As he puts it:

> Admittedly, we are looking at only one version of the operator approach, but such ad hocery and messiness in the relation between surface structure and LF is typical of such approaches. And indeed, perhaps this is why such approaches were championed more in a period during which things like [8] and [9] were probably not thought of as providing LFs for [8] and [9], but rather as just getting their truth conditions right. But as mentioned above, surely now we need to understand the claim that tenses are operators as an empirical syntactical and semantical claim about natural languages. And on the basis of considerations of the sort just adduced, it seems an implausible empirical claim. (1993: 223)

In other words, the problem with the Kamp/Vlach paraphrases is not that they do not get the truth-conditions right, but rather that they cannot 'be thought of as providing' the logical form for (8) and (9).

If the tenses are treated as object-language quantifiers, things look much better. King (2003: 223) offers the following logical forms for (8) and (9):

(8Qa) $\exists t(t^* < t$ & all persons alive (t^*): x dead (x, t))
(9Qa) $\exists t(t'' < t$ & all persons alive (t''): x dead (x, t))

[11] Dowty (1982) handles such examples using a double-indexing semantics, formally like the system in Kamp's thesis. The system is also compatible with a linked narrative tense approach.

where 't^*' designates the time of utterance, and 't'''' designates a contextually determined time that is prior to the time of utterance.

According to King, 'having something like the latter as LFs for [8] and [9] looks less ad hoc and results in a cleaner relation between surface structure and LF than do [the doubly indexed operators of Kamp and Vlach]' (2003: 223).

In short, King's main argument is not that no predicate logic with sentential operators could provide the correct truth-conditions for English sentences. Quite the opposite: If the system is rich enough, Priorian tense logic is equivalent to predicate logic with time variables in expressive power. The problem, however, is that if we need an incredibly complex tense logic to account for ordinary English sentences, then the quantifier account begins to look more attractive. Or, as Johan van Bentham puts it, 'as the complexity of Priorian tense logics increases, they reach a point where an open conversion to [predicate logic with time variables] may be preferable' (1977: 396).

4.4. TIME ADVERBIALS

King's arguments for treating the English tenses as object-language quantifiers are compelling. However, I think that the temporalist can defend herself without resorting to desperate measures. I agree with King that if the temporalist would need to call upon an exceedingly rich tense logic in order to account for ordinary English sentences, then predicate logic with time or event variables would be much preferred. However, as I will now argue, the temporalist is not in this kind of predicament, as it appears that a simple Priorian tense logic that allows for interaction between time adverbials and the basic tense operators (i.e., PAST and FUTURE) can account for the relevant data.

Before we reply to King, let us dwell for a moment on the semantics of time adverbials. As David Dowty (1979) and Michael Bennett and Barbara Partee (2004: 80f) point out, in English, time is specified not only with the tenses but also with adverbial phrases, such as:

> Indexical Frame Adverbials: this morning, two days ago, tomorrow, last spring, next year, on Wednesday, eight days from now, until Thursday, since Saturday, in two years.
>
> Non-indexical Frame Adverbials: at 3 p.m. August 21, 2015 (EST), in 2030 (CST), in June 2030 (CST).
>
> Durative Adverbial Phrases: for two weeks, for three hours last Friday, in three hours, several years in his youth, since Monday, until tomorrow.
>
> Mixed Durative and Frame Adverbials: all day yesterday, for the last two hours, from nine to five o'clock, the next three hours, until tomorrow.

Adverbial Subordinate Clauses (locatives): when my students have turned in their papers, before I was born, after dinner, while Kim was sleeping, since Becky was born, until 3 o'clock.

Adverbial Phrases of Number and Frequency: never, seldom, rarely, sometimes, always, occasionally, frequently, often, usually, more often than not, once in a while, at times, seven times.

Notice that even if the English tenses function semantically as temporal operators, there is no guarantee that time adverbials function in the same way. Granted, time adverbials do have the potential to be temporal operators. If, for example, 'in 2030' functioned as a temporal operator, it would shift the time feature of the circumstance of evaluation from the current time to some time *t* such that *t* is some time in 2030. However, in spite of their great potential, not all time adverbials can plausibly be treated as sentential operators.

Let us begin with the indexical frame adverbials (e.g., 'now', 'today', 'tomorrow', 'next week', 'on Friday', 'in June'). Some of these are pure indexicals (e.g., 'now' and 'today'), others impure indexicals (e.g., 'next week' and 'in June'). On Kaplan's (1986) theory of indexicals, the content of the pure indexicals is determined by their character relative to a context of use. For example, relative to my current context of use, the content of 'today' is a day, namely April 5, 2006 (CST).[12] Impure indexicals may be treated, for

[12] Kaplan's theory of indexicals is thought by some to be inadequate. One problem is posed by so-called answering machine examples. When you hear me saying 'I am not here now' on my answering machine, what you are hearing is true. But relative to the original context of utterance, it is false. Predelli (1998a, 1998b), Corazza et al. (2002), and Romdenh-Romluc (2002) argue that such examples create the need for a context of interpretation as distinct from the context of use. However, I think that these cases are unproblematic if we follow Kaplan in talking about a context of use (a formal sequence of parameters) rather than a context of utterance (a real speech situation). 'I am not here now' is true at a context that contains the following features: the actual world, me, you, the time of your phone call, and my apartment at the time of your phone call. Atkin (2006) raises a further problem for Kaplan's theory. The problem is that 'now' doesn't always refer to a time, and that 'here' doesn't always refer to a place, as in the following two cases, copied from Atkin. Example 1: I watch a TV program where someone hikes while giving a commentary on his journey. As he begins to walk down a mountainside, he pauses and says to the camera, 'the mountain now descends steeply to the sea' ('now' refers to a place). Example 2: At the concert hall I listen to a performance of a Mozart Divertimento. As the music proceeds, a friend whispers, 'listen how the second couplet and third refrain are repeated back-to-back.' He then pauses and says, 'Here Mozart gives the line of the refrain to the oboe' ('here' refers to a time). Such cases do indeed seem to challenge the view that 'now' always refers to the time of speech and 'here' to the location of the speaker. As Recanati (2004) and Bezuidenhout (2003, 2005) have argued, 'here' is presumably a perspectival rather than a pure indexical. If Atkin is right, perhaps 'now' is to be treated as a perspectival as well. But none of this challenges Kaplan's general semantic framework. For the referents of 'now' and 'here' would still be functions of features of the context; they just wouldn't be pure indexicals.

example, as containing a hidden indexical variable, or as a reduced expression of what the speaker has in mind when using it. For example, relative to a 1982 context 'in June' may well be a reduced expression of 'in June, 1982.'

I do not think it matters theoretically whether or not pure and impure temporal indexicals are treated as temporal operators. Whether treated as operators or adjunct clauses, temporal indexicals clearly behave differently from tense operator such as 'it was the case that' and 'it will be the case that.'

As Kaplan (1989: 510) points out, indexicals always take 'primary scope' with respect to other operators; they 'leap out to the front of the operator.' For example, 'it will be the case that I am glad that I am writing now' does not imply that I am writing in the future. Likewise, 'it is possible that I am actually tired' does not mean that there is a possible world in which I am tired. Instead, it means that it is possible that I am tired in the actual world.

Tense operators such as 'it was the case that' and 'it will be the case that,' on the other hand, do not 'leap out' of the scope of other operators. In the case of 'it will be that John turned off the stove,' for example, the past tense of 'turned off' takes us to a time that is past with respect to a future time; it does not take us to a time that is past with respect to the time of speech. The difference between temporal indexicals and tense operators such as 'it was the case that' and 'it will be the case that' is that the content of the former varies with the context of use, whereas the content of the latter is constant across contexts of use.

The same holds for the non-indexical frame adverbials (e.g., 'in June, 1939'), except that non-indexical frame adverbials are constants. So where the extension of tense operators such as 'it was the case that' and 'it will be the case that' varies with the circumstance of evaluation, the extension of non-indexical frame adverbials is constant across circumstances. For that reason they do not have ordinary scope-taking properties.

In the case of 'John didn't give a faculty member a raise,' for example, the indefinite description 'a faculty member' may take either wide or narrow scope with respect to negation. On a wide scope reading, the sentence says that there is a faculty member who John didn't give a raise, and on a narrow scope reading, it says that John didn't give any faculty member a raise.

Likewise, in the case of 'someone wanted ice cream' the quantified noun phrase 'someone' may take either wide or narrow scope with respect to the past tense. On a wide-scope reading, the sentence says that there is someone who wanted ice cream in the past, and on a narrow-scope reading, it says that in the past there was someone who wanted ice cream.

Being constants non-indexical frame adverbials do not have ordinary scope-taking properties. 'It is not the case that at 8 o'clock (there is a plane leaving for Seattle)' and 'at 8 o'clock it is not the case that (there is a plane leaving for Seattle)' receive the same

interpretation.[13] On an operator treatment, 'at 8 o'clock' maps the proposition *it is not the case that there is a plane leaving for Seattle* to the true iff *it is not the case that there is a plane leaving for Seattle* is true at an 8 o'clock circumstance of evaluation. Alternatively, we may simply treat 'at 8 o'clock' as a standard adverbial phrase that modifies a verb phrase.

Virtually the same remarks carry over mutatis mutandis to temporal locatives (e.g., 'during World War II' and 'when I returned from Italy'). 'During World War II' might be treated as a temporal operator when it occurs in a sentence like 'during World War II, Germany attacks Poland.' 'During World War II' would then map *Germany attacks Poland* to the true iff *Germany attacks Poland* is true at a circumstance of evaluation during World War II. Or on an alternative account where the locative is treated as a standard adverbial phrase, the locative would modify the main verb. For example, 'during World War II' would modify the verb 'attacks.'

Frame adverbials and locatives can but need not be treated as temporal operators. Durative adverbial phrases (e.g., 'for three hours', 'until the sun rises', 'since Greg was hired'), on the other hand, cannot. The reason is that that they merely indicate the duration of an event; they do not locate the event temporally (Bennett and Partee 2004: 86). For example, in the case of 'John walked for three hours' the past tense locates John's walking in the past, and the durative 'for three hours' measures the duration of the activity (Larson 2003).

The suggestion that duratives are devices of measurement gains prima facie plausibility from the fact that duratives fail to support temporal anaphora with 'then' (Geis 1970: Glasbey 1993: Larson 2003). Temporal anaphora is supported by frame adverbials and locatives. As examples of temporal anaphora, consider (Glasbey 1993):

(10)
(a) John climbed Mont Blanc in July. Mary climbed Mount Everest then.
(b) John studied last Monday, and Mary studied then too.
(c) John studied when Peter arrived, and Mary studied then too.

[13] As I will argue in Chapter 7, time adverbials *can* take wide or narrow scope with respect to the tenses. 'It was the case at *t* that there is a plane leaving for Seattle' and 'it was the case that (there is a plane leaving for Seattle at *t)*' mean different things. But as 'at *t*' is modifying the tense operator in the one case, and the embedded sentence in the second case, this is not a normal scope ambiguity. If 'there was a plane leaving for Seattle at *t*' exhibited a normal scope ambiguity, then there should be a difference in interpretation between 'at *t* it was the case that (there is a plane leaving for Seattle)' and 'it was the case that at *t* (there is a plane leaving for Seattle).' But there is not.

The 'then' in the second clause here goes proxy for the time adverbials in the first clause. In (10a), the 'then' goes proxy for 'in July,' in (10b) it goes proxy for 'last Monday,' and in (10c) it goes proxy for 'when Peter arrived' (Ludlow 1999, chap. 8).[14]

But duratives fail to support anaphora with 'then.' Consider, for instance (Geis 1970):

(11)

(a) John climbed Mont Blanc (in four hours/for four hours). #Mary climbed Mount Everest then.

(b) #John studied until Peter arrived and Mary studied then too.[15]

(c) #John has lived here since his father died and Mary has lived then too.

The infelicity of the 'then' clauses following sentences with duratives suggests that they fail to locate an event in time. But if durative adverbials do not serve to locate events, then they cannot function as temporal operators. They simply do not contain the sort of time-locating information that would be required in order for them to shift the time of evaluation.

Finally, let us consider adverbial phrases of number or frequency (e.g., 'sometimes' and 'always'). Some adverbs of number or frequency seem to be plausible candidates for being temporal operators. For example, 'usually' as it occurs in 'John is usually happy' may be taken to function as a temporal operator. 'John is usually happy' is true, on this approach, iff the minimal proposition *John is happy* is true in most circumstances.

The main problem with this approach is that it cannot be extended to account for adverbs of number or frequency that occur in sentences like (12) below.

A better account of adverbs of number and frequency is that offered by Lewis (1975). Lewis argued that adverbs of number or frequency are object-language quantifiers over cases, where cases are the 'values of the variables that occur free in the open sentence modified by the adverb' (1975: 10).[16] For example, the adverb 'usually,' as it occurs in

(12) If a farmer owns a donkey, he is usually rich.

[14] In fact, there is an ambiguity here. The 'then' in (10a) might also be taken to go proxy for 'in July when John climbed Mont Blanc,' and the 'then' in (10b) might be taken to go proxy for 'last Monday when John studied.'

[15] (11b) does have a marginal reading where 'then' goes proxy for 'when John studied.' But it does not have a reading where 'then' goes proxy for the durative.

[16] Lewis' analysis, familiarly, inspired Hans Kamp's (1981) discourse representation theory, and Irene Heim's file-change semantics (1982: 234ff).

quantifies over pairs of farmers and the donkeys they buy, and the anaphoric pronoun 'he' expresses a variable that gets bound by the adverb. Upon analysis, (12) cashes out to: 'Usually, if *x* is a farmer and *y* is a donkey and *x* owns *y*, then *x* is rich.' The latter is true, on Lewis' view, just in case most assignments of values to the free variables in '*x* is a farmer,' '*y* is a donkey,' and '*x* owns *y*' that satisfy '*x* is a farmer,' '*y* is a donkey,' and '*x* owns *y*' satisfy '*x* is rich.' Lewis admits that the cases quantified over may contain a time or event coordinate, as in 'sometimes it is raining' and 'Mary played chess seven times' (Larson 2003: 253). Quantification over events or times is thus a special case of the theory.

An alternative to Lewis' account is the situation-semantic approach offered by Irene Heim (1990) and von Fintel (1994). On this account, adverbs of quantification quantify over minimal situations, and anaphoric pronouns are treated as going proxy for definite descriptions. For example, (12) cashes out to: 'Most minimal situations s_1 containing a farmer and a donkey the farmer owns are part of a situation s_2 in which the farmer who owns a donkey in s_1 is rich.'

The main difference between the two approaches is that Lewis treats adverbs of quantification as unselective quantifiers that quantify over all the free variables in their scope, whereas Heim and von Fintel treat them as ordinary selective quantifiers. But the two accounts are akin in spirit. They both treat adverbs of number and frequency as object-language quantifiers.

4.5. COMPOSITE TENSE OPERATORS

King's argument against theories that treat the tenses as sentential operators is not that they cannot account for time adverbials but rather that they cannot account for cases where the tenses interact with time adverbials. However, as I will now argue, it is only natural for the temporalist to allow for exactly this sort of interaction.

Let us call the simple past tense operator 'it was the case that,' the present perfect tense operator 'it has been the case that,' and the future tense operator 'it will be the case that' the 'basic tense operators.' We can then treat time adverbials that occur with basic tense operators as modifiers. A basic tense operator modified by a time adverbial I will call 'a composite tense operator.' For example, 'it was the case that' may combine with 'at 3 p.m. on March 8, 2006' to form the composite tense operator 'it was the case at 3 p.m. on March 8, 2006 that,'[17] as in:

[17] It makes no difference whether we represent the tense operator as 'it was the case at 3 p.m. on March 8, 2006, that' or as 'at 3 p.m. on March 8, 2006, it was the case that.' However, I find the former way of representing the tense operators more natural.

(13) It was the case at 3 p.m. on March 8, 2006, that John is a firefighter

When occurring together with a temporal prefix, time adverbials do not function as autonomous operators. Instead, they help to indicate which time to look at when evaluating the intension of the operand sentence. 'It was the case at 3 p.m. on March 8, 2006, that' takes us to a particular time that falls within the class of times picked out by the past tense. The intension of 'John is a firefighter' is mapped to the true iff it is true with respect to that time. Likewise, 'it was the case yesterday that,' as it occurs in

(14) It was the case yesterday that John is a firefighter.

takes us to a past time that falls within the class of times picked out by 'yesterday.' The intension of 'John is a firefighter' is true just in case it is true some time yesterday.

Composite tense operators function in much the same way as the basic tense operators. They shift the time feature of the default circumstance of evaluation determined by the context of use. Where A is a frame adverbial or a locative, P is the simple past tense operator, and ϕ is a subject-predicate sentence, AP maps ϕ to the true iff ϕ is true at a past circumstance of evaluation whose time feature belongs to the class of times picked out by A. In the case of (13), for example, the composite tense operator 'it was the case at 3 p.m. on March 8, 2006, that' maps the proposition *John is a firefighter* to the true iff *John is a firefighter* is true at a past circumstance whose time feature belongs to the class of times picked out by '3 p.m. on March 8, 2006.' And in the case of (14), the composite tense operator 'it was the case yesterday that' maps the proposition *John is a firefighter* to the true iff *John is a firefighter* is true at a past circumstance whose time feature belongs to the class of times picked out by 'yesterday.' If there is no circumstance that satisfies the restriction, the proposition is false.

As we will see, this analysis of composite tense operators turns out to be an indispensable part of an adequate treatment of the tenses as sentential operators.

4.6. SPAN OPERATORS

Past tense operators formed with frame adverbials (e.g., 'yesterday') and locatives (e.g., 'when the students have turned in their papers') are best understood as shifting the time feature of the circumstance of evaluation from the time of speech to an instant in the past or the future. However, tense operators formed with duratives and adverbials of frequency or number are better understood as taking us to a time interval. David

Lewis (2004) calls such operators 'span operators.'[18] Span operators 'pick out' spans of time. The well-known slice operators 'pick out' moments of time.

Lewis' discussion of span operators takes place in the context of a discussion of presentism. He argues that the presentist has no right to span operators. Interpreted against the background of presentism, span operators are too ill-behaved to do any good.

First, 'they create ambiguities even when prefixed to a sentence that is not itself ambiguous' (2004: 12). For example, 'it HAS been that (it is raining, and the sun is shining)' might mean: there is a past interval throughout some of which it is both rainy and sunny.[19] Or: there is a past interval with a rainy subinterval and a sunny subinterval.

Second, truths sometimes result from prefixing span operators to contradictions. 'It HAS been that (it is raining and it is not raining)' is true, at least under one disambiguation.

Third, they are *hyperintensional* (2004: 13). The intension of a sentence created with a span operator is not a function of the intension of the embedded sentence.[20] Standard modal operators, for example, are intensional, but they are not hyperintensional. The intension of 'Kerry might have been president' is a function of the intension of 'Kerry is president.' But if 'it is raining, and it is not raining' is a contradiction, whereas 'it HAS been that (it is raining, and it is not raining)' is not, then span operators are hyperintensional.

Elsewhere I have argued that the presentist can sidestep these problems by imposing restrictions on span operators.[21] Setting aside the special problems span operators seem to present for presentism, however, the question remains whether span operators pose a more general problem.

At first, it seems that they might. The following sentence

(15) John is a firefighter, and John is not a firefighter.

is contradictory. But if Lewis is right, then the result of prefixing the present perfect span operator 'it HAS been that' to (15), namely,

(16) It HAS been that (John is a fighter, and John is not a firefighter).

[18] For discussion of span operators, see also Ludlow (1999) and Brogaard (2007c).

[19] 'It HAS been that' is a span operator.

[20] Williamson (2006: 312) defines 'hyperintensional' as follows. An operator is hyperintensional iff it is not non-hyperintensional. An operator C is non-hyperintensional iff $N(\alpha \equiv \beta) \supset N(C(\alpha) \equiv C(\beta))$, for all sentences α and β.

[21] Brogaard (2007c). On 'presentist-friendly' span operators, see also Ludlow (1999).

is consistent on one of its readings. So it might seem that Lewis' worries about span operators are justified. Span operators appear to pose a problem, not only for presentism, but also for temporalism.

There is no cause for concern, however. For one thing, there are plenty of hyperintensional operators in English. Belief operators tend to be hyperintensional:[22] One may believe some but not all necessary truths. Story prefixes, such as *According to the Superman comic books*, too, tend to be hyperintensional: 'Superman is Clark Kent' and '2 + 2 = 5' are both false (or lack a truth-value), but 'Superman is Clark Kent' is true and '2 + 2 = 5' false according to the Superman comic books. There are also hyperintensional adverbial phrases, for instance, 'allegedly,' 'in my dream,' and 'supposedly' (Larson 2002). Without the adverbials, the base sentences in 'John allegedly had lunch with Sherlock Holmes,' 'Santa Claus came over for dinner in my dream,' and 'John is purportedly engaged to Cinderella' would be false (or lack a truth-value).

For another, I do not think that we are required to say that (16) can have a reading where the embedded conjuncts are evaluated with respect to different times. Span operators shift the time feature of the default circumstance of evaluation to some interval in the past or future. If a proposition is true with respect to such a shifted circumstance, then its negation is false. If a proposition and its negation cannot be assigned opposite truth-values with respect to a given circumstance of evaluation, then the proposition in question is not truth-evaluable with respect to that circumstance.

Thirdly, whether or not there are span operators in English is, at least partially, an empirical question, and it is difficult to deny that if there are tense operators in English, then span operators are among them. Obvious candidates for being span operators include the past tense of past-tensed sentences with durative time adverbials. Consider, for instance:[23]

(17) It was the case for five years that John was a firefighter.

The tense operator 'it was the case for five years that' in (17) contains the durative time adverbial 'for five years.' Because the composite tense operator contains a durative time adverbial the time feature of the shifted circumstance of evaluation is not a moment, but a time interval.

Adverbs of quantification also seem to combine with span operators to form complex tense operators, as in:

[22] I say 'tend to be,' because not all belief operators are hyperintensional. Take, for instance, 'Superman believes that,' and suppose Superman has belief super-powers: He believes all necessary truths and no necessary falsehoods.

[23] On the most natural readings of (17), the past tense of the 'was' is stylistic. Thus (17) is similar to Richard's example 'Mary believed that Nixon was president,' which we dealt with in Chapter 2.

(18) It WAS usually the case that I was happy.

and

(19) It WAS the case seven times that Mary played chess.

The composite tense operators 'it WAS usually the case that' and 'it WAS the case seven times that' shift the time feature of the circumstance of evaluation determined by the context of use to a time interval in the past. 'Usually' and 'seven times' quantify over times in this interval.

Finally, there are cases of complex tense operators that contain both locatives and adverbs of quantification, as in:

(20) It usually WAS the case when I was a child that I behaved well.

The adverb of quantification 'usually' and the locative 'when I was a child' are constituent parts of the complex tense operator 'it usually WAS the case when I was a child that.' The locative identifies a time interval for the span operator 'to look at,' and 'usually' quantifies over the times of that interval.

Span operators with duratives (e.g., 'for five years') function in essentially the same way as slice operators with frame adverbials (e.g., 'yesterday') or locatives (e.g., 'when I was a child'). Where A is a durative, P is the past tense span operator, and ϕ is a subject-predicate sentence, AP maps ϕ to the true iff ϕ is true throughout a past time span whose duration is that indicated by A. In the case of (17), for example, 'it was the case for five years that' maps *John is a firefighter* to the truth iff *John is a firefighter* is true throughout a past time span whose duration is five years.

Span operators with adverbs of quantification (e.g., 'usually') do not function in quite the same way as slice operators. Where A is an adverb of quantification, P is the past tense span operator, and ϕ is a subject-predicate sentence, AP maps ϕ to the true iff ϕ is true at a past circumstance of evaluation that contains an A-modified class of past times as the value of the time feature. For example, (18) is true at a context *c* iff *I am happy* is true at most times that are past relative to the time of *c*, and (19) is true at a context *c* iff *Mary plays chess* is true at seven subintervals that are past relative to the time of *c*.

Span operators with adverbs of quantification can be restricted by locatives, as in (20). Where A is an adverb of quantification, L is a locative, P is the past tense span operator, and ϕ is a subject-predicate sentence, APL maps ϕ to the true iff ϕ is true at a past circumstance of evaluation that contains an A-modified class of past times that satisfy L. So (20) is true at a context c iff *I behave well* is true at most times that (i) are past relative to *c*, and (ii) satisfy the locative.

4.7. THE ELLIPSIS THEORY

Nathan Salmon (1989: 380) has offered an account of the tenses that is akin in spirit to the above account. According to Salmon, time adverbials, such as 'at 3:00 p.m. on December 4, 1983,' are 'incomplete temporal operators,' because they apply 'to a tensed but otherwise temporally unmodified sentence such as 'I will be busy' to form a new sentence' (380), namely: 'at 3:00 p.m. on December 4, 1983, I will be busy.' As Salmon puts it:

> Since the extension of an incomplete specific temporal operator such 'at 3:00 p.m. on 4 December 1983', without an accompanying tense operator, is simply the indicated time, in order to obtain a complete sentence whose extension is a truth-value from an incomplete specific temporal operator and an untensed clause as operand, a tense operator *must be* supplied as a bridge connecting the superintension of the operand clause with respect to a time *t* (e.g., the time of utterance) to the extension of the temporal operator with respect to *t*, thereby achieving truth-value. Which tense operator is appropriate will depend on the direction of the indicated time, earlier or later, relative to the time *t*. This account thus accommodates the fact that the appropriate complete temporal operator typically shifts its constitutive tense from future to past with the passage of time. (1986: 382)

'At 3:00 p.m. on December 4, 1983, I will be busy' is, on Salmon's view, interpreted as meaning that *3:00 p.m. on December 4, 1983,* is a future time at which I am busy, and 'sometimes, I was busy' is interpreted as some times are past times at which I am busy. Time adverbials thus function either as a kind of quantifier (e.g., 'sometimes', 'always') or as singular terms (e.g. 'in May, 2008', 'when I returned from Paris'), and the rest of the sentence (e.g., 'I will be busy') functions as a kind of predicate.

Salmon further notes that simple past-tensed and future-tensed sentences such as 'I was busy' or 'I will be busy' are semantically incomplete. Apart from special context, they do not have truth-values, as their extension is a function from times to truth-values (1989: 380). But context may supply the information required to complete it (1989: 381). Sometimes the placeholder for the contextually supplied time adverbial is made explicit, as in 'I was busy then' or 'I was busy at that time.' Salmon therefore calls his theory the 'ellipsis theory of past tense': Simple past-tensed and future-tensed sentences are 'elliptical' for the result of adding 'then' or 'hence' to the sentence (1989: 385).

To further illustrate the need for contextual restriction, consider:

(21) Frege always was busy.

On Salmon's account, the extension of 'Frege was busy' with respect to a context of use *c* is a class of time *t* such that *t* is earlier than the time of speech (or a function from past times to truth-values). The complete sentence is true at *c* iff the extension, with respect to *c*, of 'always' is an element of the extension, with respect to *c*, of 'Frege was busy.' That being so, (21) is true iff every time is both an element of the class of past times and a time at which Frege is busy.

On the account suggested here, 'always' modifies the span operator 'it was the case that.' 'it always was the case that' maps the proposition *Frege is busy* to the true iff *Frege is busy* is true at every time belonging to the past.

But as Salmon (1989: 383, note 29) points out, (21) does not mean that every time is a past time at which Frege is busy. In a present day context, there would at least be a restriction to the effect that the relevant times are times at which Frege is alive and well. On the present account, the past tense operator may be represented as 'it always was the case *then* that,' where 'then' makes reference to a specific time interval or introduces a condition that the past times must satisfy. I return to how Salmon's theory differs from the one outlined in this book in Chapter 6.

4.8. THE TEMPORAL ANAPHORA HYPOTHESIS

My proposal also bears a certain resemblance to Ludlow's (1999) A-theoretical semantics. Ludlow notes that the English tenses may be anaphoric on time adverbials occurring earlier in the discourse. Consider, for instance, example (10a), repeated from above:

(10a) John climbed Mont Blanc in July. Mary climbed Mount Everest then.

The 'then' in the second sentence is anaphoric on the time adverbial in the first sentence. So the second sentence is to be interpreted as meaning that Mary climbed Mount Everest in July. That 'then' can be anaphoric on time adverbials in the previous discourse is relatively uncontroversial. And so is the idea that simple past-tensed sentences can contain implicit temporal anaphors (as in 'I didn't turn off the stove [then]').

But Ludlow goes one step further. According to Ludlow, '*every* sentence has a when-clause or a temporal adjunct of some form (e.g., 'before . . . ', 'after . . . ') or a temporal anaphor which stands in for one' (1999: 9). So the sentence 'John is a firefighter' is shorthand for 'John is a firefighter as I am uttering this sentence,' and 'John was a firefighter' is shorthand for 'John was a firefighter when . . . .'

There is, I think, much to be said for Ludlow's proposal. It sidesteps some obvious problems for standard tense logic. For example, if there are no implicit temporal adjunct clauses, then 'it was the case that it was the case that *p*' simply collapses into the

simple past 'it was the case that *p*.' But, as Ludlow points out, a past-perfect sentence like 'I had left' seems to require a complex tense construction. For example, I might continue 'I had left' with 'when Mary arrived.' Another virtue of Ludlow's proposal is that it can explain why the Partee sentence 'I didn't turn off the stove' is not simply obviously false. The reason it is not obviously false is that it has an implicit time adverbial, as in 'I didn't turn off the stove this morning.'

However, despite its obvious merits, I think that there is good reason to accept only a weakened version of Ludlow's temporal anaphora hypothesis. The weakened hypothesis is that most ordinary language sentences have either an explicit or implicit temporal adjunct clause.

One reason for not embracing the stronger claim is that I agree with metaphysical eternalists such as Ted Sider (2006) that a sentence like 'there are wholly past objects' can be used to make an assertion that would be true if metaphysical eternalism were true. On Ludlow's proposal, however, 'there are wholly past objects' can only be used to make a false assertion. As 'there are wholly past objects' is in the present tense, it is short for 'there are wholly past objects as I am uttering this sentence.' As Ludlow intends it, the latter entails that wholly past objects are located temporally simultaneously with the speaker. So 'there are wholly past objects' would be false even if metaphysical eternalism were true. I will return to this issue in Chapter 7. Of course, this is not an objection to Ludlow's theory. For what constrains Ludlow in giving a Prior-style semantics of tense is the avoidance of B-theory resources. In particular assuming that there are no past and future times, the question arises how to treat expressions such as '3 pm, July 1, 2001.' The theory of temporal anaphora is the answer.

A second reason to resist the stronger hypothesis is that there is no good reason to treat ordinary present-tensed sentences as containing the time adverbial 'as I am uttering this sentence.' On Prior's redundancy theory of the present tense, 'John is a firefighter' has the same semantic content regardless of whether it is embedded in the scope of other operators or occurs free. I defend Prior's redundancy theory in Chapter 6.

4.9. EXPLAINING THE COUNTEREVIDENCE

I have argued that time adverbials combine with tense operators to form composite tense operators. This suggestion helps to explain the empirical evidence King brought to bear against a standard operator treatment of the tenses. King's first reason against an operator treatment of the tenses was that it yields the wrong result for past-tensed sentences with frame adverbials. Consider, for instance (2003: 216):

(4) Yesterday, John turned off the stove.

Since (4) contains two operators, it might be thought that it should have the following two readings (where, following King, Y is a 'yesterday' operator, and P is the past tense operator):

(4a) Y(P(John turns off the stove).
(4b) P(Y(John turns off the stove).

Intuitively, both of these readings are mistaken. However, this problem goes away if we allow the tenses to interact with time adverbials. The following is a more plausible paraphrase of (4):

(4Ta) It was the case yesterday that (John turns off the stove).

'It was the case yesterday that' functions as a circumstance-shifting operator that maps *John turns off the stove* to the true iff *John turns off the stove* is true at a past circumstance of evaluation whose time feature belongs to the class of times picked out by 'yesterday.' As I discuss further in Chapter 5, English requires that the embedded clause in (4Ta) occurs in the past tense. So, in ordinary English, (4) should be paraphrased as 'it was the case yesterday that John turned off the stove.' On the relevant reading, the past tense of the embedded clause is vacuous. There is also an alternative reading where the past tense of the embedded clause is not vacuous. For example, if John turned off the stove the day before yesterday, it may be true to say 'it was the case yesterday that John turned off the stove.'

Related considerations help to address cases where the tense of one clause is anaphoric on the tense of a preceding clause, as in (Partee 1994: 53):

(5) Sheila had a party last Friday, and Sam got drunk.

It seems that the past tense of the first sentence picks out a time interval that falls within the time interval picked out by 'last Friday.' The past tense of the second clause is anaphoric on the interval picked out by the past tense of the first clause.

As mentioned above, King takes that to present an intractable problem for an operator treatment of the past tense. As he puts it:

> There seems to be a sort of anaphoric phenomenon: the second [clause] past tense takes on the same value as its "antecedent" past tense in the first [clause]. Again, no account of the tenses as standard operators gives us any insight into this behavior. (2003: 217)

But a semantics that treats the tense operator in the first clause in (5) as a composite tense operator does give us 'insight into this behavior.' For, on this analysis, the first clause has the form 'it was the case last Friday that Sheila has a party.' The composite tense operator 'it was the case last Friday that' shifts the time feature of the circumstance of evaluation from the time of speech to a time that is in the extension of the class of times picked out by 'last Friday.' The past tense operator in the second clause is 'anaphoric' on the tense operator of the first clause. 'Sam got drunk' comes out as 'it was the case last Friday when Sheila had a party that Sam got drunk.' Under the present proposal, then, temporal anaphora does not appear to pose a particularly difficult problem.

The final examples offered against a treatment of the tenses as sentential operators were the following:

(8) One day, all persons alive now will be dead.
(9) Once all persons alive then would be dead.

To translate these sentences, it might be thought that we need to introduce special doubly indexed operators. But the result is unwieldy and ad hoc. If the tenses are treated as object-language quantifiers, on the other hand, things look much better. As King puts it:

> Treating tenses as involving quantification over times (and expressing relations between times) rather than index shifting sentence operators (i) allows for a simpler more elegant less ad hoc treatment of tenses and temporal expressions than does an operator treatment; and (ii) allows for a more plausible account of the relation between the surface structures of English sentences and the syntactic representations of those sentences at the level of syntax that is the input to semantics. As I said above, this is why current researchers on tense adopt the former approach; and this is good reason for thinking it is the correct empirical, syntactical claim about tense in natural language. (2003: 223)

As mentioned above, King offers the following paraphrases of (8) and (9):

(8Ka) $\exists t(\mathrm{t}^{*} < t$ & all persons alive (t^{*}): x dead $(x, t))$
(9Ka) $\exists t(t'' < t''$ & all persons alive (t''): x dead $(x, t))$

where 't' is a variable ranging over times,' t^{*}' designates the time of utterance, and 't'''designates a contextually determined time that is prior to the time of utterance. Sentence (9Ka) says that there is a contextually determined time t'' that is earlier than some time t, and all persons who are alive at t'' are dead at t.

I grant that the Kamp/Vlach paraphrases of (8) and (9) are rather cumbersome. However, in a tense logic with composite tense operators and plural variables, simple paraphrases of (8) and (9) can be given. I suggest the following (*X* is a plural variable. Cf. Boolos 1984; Bostock 1988; Bricker 1989; Forbes 1989: 93ff):

(8Ta) For all persons *X*, it will be one day that (*X* do not exist).
(9Ta) It once was the case that (for all persons *X*, it will be the case that (*X* do not exist)).

Here (8Ta) says that the *X*s are such that they will not exist in the future, while (9Ta) says that the *X*s in the past were such that they would not exist in the future. Unlike the Kamp/Vlach paraphrases, (8Ta) and (9Ta) are neither ad hoc nor unwieldy: They contain no peculiar operators and are, in my opinion, as simple and elegant as King's analyses.

4.10. SIGNPOST

King's rejection of a tense operator treatment of the tenses and temporal prefixes is far from decisive. The quantificational account can handle the presented data gracefully. But the alternative, of accepting that the tenses and temporal prefixes function as temporal operators, is scarcely less unattractive. And this is good news for the temporalist. For the quantificational treatment of the tenses and temporal prefixes is squarely at odds with temporalism.

5

REVIVING PRIORIAN TENSE LOGIC

In the previous chapter I have argued that an operator account of the tenses has the means to explain the empirical evidence offered against it. I will now provide a more general defense of Priorian tense logic.

5.1. THE SOT RULE

A good theory of tense in English must be able to provide an account of the interpretation of relative clause sentences where the time introduced by the past tense of the relative clause is later than the time introduced by the past tense of the main clause. These interpretations are also known as 'later than matrix interpretations.' Consider the differences between the readings of:

(1) Peter saw a man who was a cyclist.
(2) Peter said that Liz was ill.

Both sentences can be interpreted in the same way as 'Mary believed that Nixon was president,' which we considered in Chapter 2. Sentence (1) can furthermore be interpreted as meaning that Peter saw a man at *t* who was a cyclist at *t*, or as saying that Peter saw a man at *t* who was a cyclist at a time prior to *t*. Likewise, (2) can be interpreted as meaning that Peter said at *t* that Liz was ill at *t*, or as meaning that Peter said at *t* that Liz was ill at some time prior to *t*.

But (1) has a further reading which (2) does not have, namely, a later than matrix interpretation.[1] On this reading, Peter saw at some time in the past a man who was

[1] Stanley (2005: 136, note 5) thinks the problem that these sentences present for the temporalist is that the seeing/hearing may occur simultaneously with the cycling/illness. In other words, he thinks that the temporalist is required to treat both occurrences of the past tense as past-tense operators. But if that were indeed the source of concern, then the eternalist would have as much reason to worry as the temporalist. For the eternalist would then be required to treat both occurrences of the past tense as quantifiers, giving rise to the exact same problem.

later a cyclist. As King (2003: 231) points out, this reading is salient in the case of 'in 1980 Peter saw a man who was a cyclist in 1995.' The difference between (1) and (2) evidently has to do with the fact that (1) contains an object relative ('a man who was a cyclist') whereas (2) contains a complement clause ('that Liz was ill').

Higginbotham argues that indirect discourse 'is to be understood in terms of our reporting practices, and that embedded clauses have for their reference themselves, understood as they would be if uttered in isolation by the speaker' (2002: 213). For that reason the 'temporal orientations' of a complement clause of an indirect speech report and the sentence actually uttered by the speaker in the indirect speech report must match (2002: 214). If Peter says 'John will be in Paris in April' in March, and Mary says 'John was in Paris in April' in May, then there is a sense in which they have said the same thing, but the temporal orientations of their utterances differ. One is in the future tense, the other in the past tense. So, according to Higginbotham, Mary cannot say 'Peter said in March that John was in Paris in April' but is required to use the future tense: 'Peter said in March that John would be in Paris in April.' The tense of the complement clause 'John would be in Paris in April' then matches the tense of Peter's utterance. This explains why (2) does not have the additional reading. If (2) were interpreted as meaning 'Peter said in March that Liz was ill in April,' the temporal orientation of the complement clause would not match the utterance of the speaker whose speech is reported.[2]

Another problem associated with sentences like (1) and (2) is that it is not entirely clear how to account for the first and the third readings of (1) and the first reading of (2). The problem is that the evaluation time introduced by the past tense normally lies in the past relative to the reference time. Yet on the first reading of (1) and (2) the seeing/hearing occurs simultaneously with the cycling/illness, and on the third reading of (1) the seeing occurs in the past of the cycling.

One way to explain these readings is to follow Mürvet Enç (1987) in treating the past tense as anchored: The past tense always refers to a time that is earlier than a time (e.g., the time of speech) referred to by a constituent elsewhere in the sentence.[3] Moreover, two past-tense morphemes are co-indexed if the one is locally c-commanded (i.e., syntactically bound) by the other. The co-indexing explains the simultaneous-with-matrix reading of past-tensed relative and complement clause sentences. As Enç's approach

[2] Higginbotham's hypothesis also gives us the right answer in cases like 'John said the bus was leaving at 3:00,' where it might seem that a later-than-matrix interpretation is available. 'John said the bus was leaving at 3:00' is true if John said 'the bus is leaving at 3:00.' So the later-than-matrix interpretation is not strictly available.

[3] Enç's proposal is similar in important respects to the view that descriptions are predicates with free variables. For a defense of this view of descriptions, see Kamp (1981), Heim (1982), Fara (2001).

treats the tenses as referential, Enç's approach, if successful, gives us reason to doubt that the tenses function as sentential operators.

However, Enç's approach is not entirely happy. Enç argues that the future tense is a modal and not a real tense. But, as Ogihara (manuscript) points out, the past tense can be c-commanded by a future auxiliary, as in (3) below (from Kusumoto 1999: 39):

(3)
(a) I will marry a man who *went* to Harvard.
(b) I thought that the student would not admit that he *cheated*.
(c) David will say that he *was* out of town.
(d) No matter what you give him to eat, he will eat it and tell you that he *liked* it.

Each of these cases has a reading where the past tense is past relative to a future time. Since Enç's proposal requires that the past-tense morpheme always refers to a time that is earlier than a time that is referred to elsewhere in the sentence, Enç can account for the sentences in (3) only if she allows the past tense to refer to a time that is earlier than a time referred to by a future auxiliary.

The problem is that a past tense morpheme locally c-commanded by a future auxiliary does not always refer to a time that is earlier than a time referred to by a constituent elsewhere in the sentence. Consider, for instance:

(4)
(a) John decided a week ago that in ten days he would say to his mother that they *were* having their last meal together (Abusch 1988).
(b) John said he would buy a fish that *was* still alive (Ogihara 1989).

Sentence (4a) is true if John decided to say 'we are having our last meal together,' and (4b) is true if John said 'I will buy a fish that is still alive.' But then 'were' and 'was' do not need to refer to a time that is earlier than a time referred to by a constituent elsewhere in the sentence.

Cases like (4) suggest that English has an SOT rule (sequence-of-tense rule), which allows for optional deletion of a past-tense morpheme that is locally c-commanded by another past-tense morpheme (Jespersen 1909–1949; Ladusaw 1977; Dowty 1986; Ogihara 1989, 1996; Kusumoto 1999). The existence of an SOT rule does not rule out a treatment of the tenses as sentential operators. More importantly, the hypothesis that English has an SOT rule explains the simultaneous-with-matrix interpretation of relative and complement clause sentences.

5.2. LATER-THAN-MATRIX INTERPRETATIONS AND KAMP/VLACH SENTENCES

That still leaves us with the problem of explaining the interpretation of relative clause sentences where the time introduced by the past tense of the relative clause is later than the time introduced by the past tense of the main clause. The later-than-matrix interpretation presents a prima facie problem for Priorian tense logic because Priorian tense logic predicts that the past tense of the relative clause is indexed to the time introduced by the matrix tense. So where (5) below causes trouble for Priorian tense logic, (6) does not.

(5) In 1992 Alice was sitting on a chair which Clinton was sitting on in 1995.
(6) In 1992 Alice was sitting on a chair which Clinton would be sitting on in 1995.

Example (6) can be interpreted as having the following form:

(6a) It was the case in 1992 that ($\exists x$. Alice is sitting on x, and it will be the case in 1995 that (Clinton is sitting on x))

The crucial difference between (5) and (6) is that Clinton's sitting is reported in the past tense in (5) but is reported in the future tense in (6). Later-than-matrix interpretations seem to present one of the most intractable problems for Priorian tense logic.

Sentences with later-than-matrix interpretations are subset of a larger group of sentences that present a major challenge to Priorian tense logic: The so-called Kamp/Vlach sentences. Consider, for instance:

(7) A colleague of mine who was a child prodigy got her Ph.D. from Harvard.
(8) John Smith hired a junior professor who later became president.
(9) John hired a junior professor who will become president.[4]

Many Kamp/Vlach sentences are problematic in part because they have later-than-matrix interpretations. Because (8) contains the word 'later' it only has the later-than-matrix interpretation. It is thus a close equivalent to 'Peter saw a man who was later a cyclist.'

[4] Here is another example from van Bentham (1977: 417). 'There will always jokes be told that were told at one time in the past.' Van Bentham thinks this is a counterexample to relatively simple Priorian tense logics. But it is not if we allow a tense operator, AF, that translates 'it will always be the case that.' We can then translate it as follows ('Jx' means x is a joke that is being told): AF($\exists x$(PJx)).

More generally speaking, Kamp/Vlach sentences constitute a problem for Priorian tense logic because it is not at all clear how to give a compositional account of their most natural readings using tense operators. For example, it may seem that we can get the following reading of (7) with nested clauses: $\exists x$(colleague x & P(get Ph.D. x & P(prodigy x))), where P is the past-tense operator. This interpretation says that there is someone who is currently a colleague who got her Ph.D. from Harvard at some point in the past and who was a child prodigy before that. Unfortunately, this reading cannot be yielded compositionally.

I think the best way for the Priorian tense logician to deal with these kinds of cases is to turn to Montague's PTQ fragment. This fragment appears to be able to produce the desired readings (for an overview of Montague semantics, see for example Dowty et al. 1980).

5.3. THE PTQ FRAGMENT

The PTQ fragment uses Priorian tense operators introduced by the syntax. As one tense operator is introduced per clause, a tense operator can occur in any relative clause or main clause. A compositional interpretation is thus derived compositionally from its syntax.

But there is one now well-established exception to compositionality. Noun phrases (semantically generalized quantifiers) such as 'a colleague of mine who was a child prodigy' can optionally have wider scope than the main clause in which they occur. This means that the tense of a relative clause can have wider scope than the tense of the main verb of the clause.

Montague introduced this via a (optional) 'quantifying in' rule for noun phrases. The rule predicts that the whole noun phrase takes wider scope than the main clause (see also Ogihara 1989, 1994, 1996). When the rule applies, the noun phrase is quantified in from outside. A tense operator inside a relative clause modifying a noun phrase (e.g., 'who was a child prodigy') will thus have wider scope than the tense in the main clause (e.g., 'got her Ph.D. from Harvard'). If the noun phrase (e.g., 'a colleague who was a child prodigy') is not quantified in from outside, the tense in the main clause will have scope over the tense in the relative clause.

If the semantics is to be compositional, a tense that occurs inside a relative clause cannot escape the relative clause so as to include the head noun. Consider again:

(7) A colleague of mine who was a child prodigy got her Ph.D. from Harvard.

As noted earlier, it is tempting to think that we can get the following reading with nested clauses: '$\exists x$(colleague x & P(get Ph.D. x & P(prodigy x)))'. P is the past tense operator.

On this reading, (7) says that there is someone who is currently a colleague who got her Ph.D. from Harvard at some point in the past and who was a child prodigy before that. Unfortunately, this reading cannot be yielded compositionally.

Compositionality requires that a meaning is yielded for the noun phrase 'A colleague of mine who was a child prodigy,' and that this meaning is then combined with the meaning of 'got a Ph.D. from Harvard.' So given a compositional interpretation of English syntax (with the exception that noun phrases can scope out), it is not possible for the past tense in 'was a child prodigy' to have wider scope than 'colleague of mine.'

The reason that a meaning is yielded for the whole noun phrase 'a colleague of mine who was a child prodigy' is that within the whole noun phrase 'a colleague of mine who was a child prodigy,' the relative clause is a self-contained syntactic constituent. This constituent has the syntax of a full sentence except that it lacks a noun phrase. Instead of a noun phrase it has a variable that is bound by the noun phrase. So the relative clause is of the form '*x* who was a child prodigy,' where the variable '*x*' is bound by 'a colleague of mine.' The compositional structure of 'a colleague of mine who was a child prodigy' is as follows. 'A colleague of mine who was a child prodigy' is composed of the indefinite article 'a' and the noun phrase 'colleague of mine who was a child prodigy.' The latter is composed of 'colleague of mine' and 'who was a child prodigy,' which in turn is composed of 'who' and '*x* was a child prodigy.' Finally, '*x* was a child prodigy' is composed of the past-tense morpheme and '*x* is a child prodigy.'

As PTQ observes compositionality (with the exception of the 'quantifying in' rule), it yields the following readings for (7):

(7) A colleague of mine who was a child prodigy got her Ph.D. from Harvard.
(7a) $\exists x$(colleague x & P(prodigy x) & P(get Ph.D. x))
(7b) P($\exists x$(colleague x & P(prodigy x) & get Ph.D. x))

While (7a) translates as 'some colleague is such that it was the case that she is a prodigy, and it was the case that she gets her Ph.D.,' (7b) translates as 'it was the case that some colleague, who was a prodigy, gets her Ph.D.' In (7a) there is quantifying in: the whole noun phrase 'a colleague of mine who was a child prodigy' has wider scope than the main clause, in (7b) there is no quantifying in. So the whole noun phrase 'a colleague of mine who was a child prodigy' has scope under the tense of the main clause.

PTQ yields the following readings for (8):

(8) John Smith hired a junior professor who later became president.
(8a) $\exists x$(junior professor x & P(become president x) & P(John hires x))

(8b) P(∃*x*(junior professor *x* & P(become president *x*) & John hires *x*))

Whereas (8a) says that there is some junior professor who became president and who was hired by John, (8b) says that it was the case that there is some junior professor who became president earlier than that and who was hired by John. The second reading is unavailable. But the reason for this is that 'later' occurs in the sentence. If we had changed the example 'John hired a junior professor who later became president' to 'John hired a junior professor who became president ten years earlier,' the first reading would have been unavailable.

PTQ yields the following readings for (9):

(9) John hired a junior professor who will become president.
(9a) ∃*x*(junior professor *x* & F(become president *x*) & P(John hires *x*))
(9b) P(∃*x*(junior professor *x* & F(become president *x*) & John hires *x*))]

While (9a) says that there is a junior professor who will in the future be such that she is president and previously hired by John, (9b) says that it was the case that some junior professor who would become president was hired by John.

PTQ does not yield the desired results with respect to the will/would distinction. The 'quantifying in' rule for noun phrases was introduced in order to account for anaphoric binding and *de re* readings of noun phrases which are syntactically embedded in intensional contexts. The interaction of the 'quantifying in' and the tense rules yields the following prediction: If a noun phrase that has a relative clause containing a tense operator occurs syntactically inside an intensional context, the noun phrase can have a *de re* reading iff the tense in the relative clause is interpreted as having scope independent of the tense in the main clause. The noun phrases can have a *de dicto* reading iff the tense is interpreted as having narrower scope than the main clause tense.

The 'quantifying in' rule and the tense rules yield predictions of the following sort. If 'was looking for' creates an intensional context, 'John was looking for a child that will become king' must have a *de re* interpretation, and 'John was looking for a child that would become king' must have a *de dicto* interpretation.

This prediction is not fully borne out, as a *de re* interpretation seems available also for 'John was looking for a child that would become king.' This is because within a discourse 'would' can indicate a time calculated forward from a past time mentioned or implicit in an earlier sentence, even when 'would' is not embedded inside a past tense. Such 'independent' interpretations of 'would' need not be *de dicto*.

To deal with 'will' and 'would' we could introduce 'will' by the normal syntactic rules and postulate transformation which applies when a past tense operator is introduced into a clause and which changes any 'will' anywhere inside the clause to 'would.'

Alternatively, we can stipulate that English has two future-tense modals. With few exceptions (the only exceptions being special TV history narrator talk), 'will' forces a later-than-speech-time interpretation, whereas 'would' forces a later-than-past-time interpretation.

5.4. PRAGMATIC RULES FOR NOUN DENOTATION

Regardless of how the tenses are interpreted, we need further pragmatic rules to account for noun denotation. Tense logicians have long known that tense affects noun denotation and verb denotation in different ways. An example (from Emmon Bach):

(10) I first met my wife when she was only a ten-year old girl.

Clearly (10) need not be interpreted as saying that the speaker married a ten-year old child but is more naturally interpreted as saying that the speaker met a child who later became his wife. There are also cases where the head noun applies at the time of the reported event but not at the time of speech (from Dowty):

(11) Ah, yes, Lake Louise is a beautiful place: my husband and I went there for our honeymoon. (But five years later, we got a divorce.)

Example (11) does not require for its interpretation that the person in question is the speaker's husband at the time of speech or at the time of the reported event. Even if the speaker is currently divorced and has only been married once, and the hearer knows this, (11) is assertable. Note that the speaker could also have said 'my former husband.' But the modifying attribute is required only if it is not salient in the conversational context that the speaker is divorced.

A further example to illustrate:

(12) Did you hear the news? Mike and his ex-wife have gotten married again.

Clearly (12) does not require that Mike's current wife is also his ex-wife but only that Mike once divorced his current wife.

In her dissertation Mürvet Enç (1981, cf. 1986) showed that noun denotation is independent of tense and depends on what is pragmatically the most contextually salient time for determining the noun's denotation. One of the examples she considered was:

(13) Every high school senior in this school between 1990 and 2000 met a United States senator.

Example (13) can be true if the students were not all seniors at the same time and were not seniors at the time of their meeting. This becomes more salient if we add 'at one time or another.' Moreover, the senators said to be involved in the meetings need not have been in the senate concurrently, for (13) can even be true if some seniors met a person who was not a senator at the time of the meeting but was only a former senator.

Enç offered even more intricate examples where no possible assumed configuration of scopes of the tenses would suffice for a treatment of noun denotation as affected semantically by tense. She concluded that the relevant time for an individual to count as being in the denotation of a noun is not semantically constrained by any tenses anywhere in the sentence at all but is a purely pragmatic matter. As a result, there can be no truth-conditional difference between, for instance, 'a child who was born five months early left the hospital yesterday' and 'a child who was born five months early graduated from college yesterday' or between 'tomorrow we will talk to a prisoner who was released yesterday' and 'tomorrow we will talk to a prisoner who has been behind bars for sixty years.'

Denotations of nouns are to be treated as independently deictic. Their denotations are determined by what is pragmatically the most contextually salient time for determining their denotation. A noun can thus be appropriately applied to an individual if it is mutually understood in the conversational context that the individual had, has or will have that property ascribed by the noun. This is not to say that the noun denotation is never that of the verb of its clause, but only that this is not true in general. Enç's conclusion is now widely accepted by tense logicians.

5.5. PARTEE SENTENCES

One virtue of a Priorian tense logic that builds on the PTQ fragment is that it yields the correct result with respect to Partee sentences, such as (Partee 1973):[5]

(14) If you were king, you would cut off the head of everyone who offended you.

Partee thinks that (14) is ambiguous between a transparent interpretation where 'everyone who offended you' denotes everyone who offended you in the past in the actual world, and an opaque interpretation where it denotes everyone who offended you in a non-actual world where you are king. On Partee's proposal, we can get the transparent reading by assuming that the past tense refers to some actual past time

[5] Another example is: 'Everyone who has come will be going to meet those who play after the concert' (van Bentham 1977: 417). Let 'A' mean 'arrive,' let 'P' mean 'play,' and let 'C' mean 'x meets y after the concert.' We can then translate it as follows (assuming movement): $\forall x(\mathrm{P}(\mathrm{A}x) \rightarrow \forall y\mathrm{F}(\mathrm{P}y \rightarrow \mathrm{C}xy))$. Or in a system containing N and K: $\mathrm{NF}\forall x(\mathrm{NP}(\mathrm{A}x) \rightarrow \mathrm{KF}\forall y(\mathrm{NP}y \rightarrow \mathrm{C}xy))$.

(1973: 56). So Partee predicts the following two readings (@ is the actual world. I use logical notation for simplicity's sake):

$Ky\ N\rightarrow \forall x(Oxy \rightarrow Cyx)$ Opaque
$Ky\ N\rightarrow \forall x(Oxy_{@} \rightarrow Cyx)$ Transparent

Given Priorian tense logic, on the other hand, (14) has a reading where 'everyone who offended you' moves out of the scope of the subjunctive conditional (P is the past tense and $\Box\!\!\rightarrow$ is the subjunctive conditional):

$Ky\ \Box\!\!\rightarrow \forall x(Oxy \rightarrow Cyx)$ Opaque
$\forall x(POxy \rightarrow (Ky\ \Box\!\!\rightarrow Cyx))$ Transparent

The two formulations of the transparent reading differ in that the Prior-style formalization entails that for everyone in @ who offended you, you cut off their heads in *w* (the king world), while the Partee-style formalization entails only that for everyone in @ who offended you *and who exists in w*, you cut off their heads in *w*.

Of course, given the converse Barcan formula these come to the same, but if not, not.[6] For the converse Barcan formula entails that nothing in the actual world could have failed to exist.[7] In that case it is arguable that the Prior-style version is closer to the intuitive reading.[8]

5.6. DOUBLE-ACCESS SENTENCES

Another virtue of a Priorian tense logic is that it provides a better account of double-access sentences than alternative tense logics. Consider, for instance (Enç 1987; Abusch 1988; Ogihara 1989; Higginbotham 2002):

(15) John said that Mary is pregnant.

[6] The approach in Montague semantics was to quantify over all possible and actual individuals with the universal quantifier (including those individuals are actual only at past or future times), not merely currently existing ones, so that Barcan equivalences would hold officially.

[7] The converse Barcan formula says: 'It is necessary that for all *x*, *p*' entails 'for all *x*, it is necessary that *p*.' The converse Barcan formula entails monotonicity: the domain of the actual world is a subset of the domain of any world. To get anti-monotonicity (i.e., the domain of any world is a subset of the domain of the actual world) in systems without a symmetric accessibility condition, we need the Barcan formula. It is arguable that we only need the offensive individuals to exist in every world. For instance, if every offending being were a necessarily existing being, then the transparent readings would be equivalent (it seems).

[8] Thanks to David Chalmers for helpful discussion here.

The problem posed by double-access sentences is that they can be true only if the time at which the embedded content is true (if true at all) overlaps the time of speech. So for (15) to be true, John must have said 'Mary is pregnant,' and the time of Mary's alleged pregnancy must overlap the time at which the sentence is reported.[9]

As it turns out, however, double access sentences like (15) make trouble for the quantificational analysis of the tenses, and not for a treatment of the tenses as sentential operators. For on the quantificational account, (15) should come out as follows:

(15a) $\exists t(t < t^* \,\&$ John says (t) that Mary is pregnant $(t))$

But (36a) does not require for its truth that Mary's alleged pregnancy overlaps the time of speech. Double access sentences also pose a recalcitrant problem for event analyses.

As Higginbotham (2002: 215) points out, quantificational analyses can account for sentences like (36) only by tinkering with the event or time variable, that is, only if the event or time parameter 'takes in the time of the speaker's report' as well as the time at which John was speaking.

If the quantifiers range over times, we would get the following:

(15b) $\exists t(t < t^* \,\&$ John says (t) that Mary is pregnant $(t, t^*))$

But it is difficult to see how this account could possibly account for the validity of inferences such as:

(A)
John said that Mary is pregnant.
Peter believes everything John said.
Hence, Peter believes that Mary is pregnant.

On one reading of the first premise (double access), its truth requires that John said that Mary's pregnancy overlaps his time of speech and the present. Reading the conclusion in a similar way, the argument is valid but the truth of the conclusion requires Peter to believe that Mary's alleged pregnancy overlaps the time of John's past speech. But surely the conclusion does not have such a reading. So the argument cannot be valid if the first premise is given a double access reading.[10]

[9] Mary doesn't have to be pregnant at the time of speech for the sentence to be true.

[10] On Higginbotham's way of doing things, the first premise has (at least) two readings. On the other reading (not the double access reading), the sentence is true just in case in the past John

Priorian tense logic does not have this unwelcome implication. I suggest that we take the extension of the first premise, on the double access reading, rather than the content to be doubly indexed to times. As we saw in Chapter 1, double indexing is already required to account for sentences with factive attitude verbs. For a sentence with a factive attitude verb such as 'know' to be true the embedded sentence must be true at the actual world and at worlds compatible with what the believer actually believes. Since double-access sentences are akin in spirit to factive attitude sentences, it should come as no surprise that an adequate account of them requires double indexing. Here is the truth-condition for the first premise:

> For all worlds *w* compatible with what John said at some past time *t* in the actual world @, Mary is pregnant at <*w*, *t*> and <*w*, *t**>.

The content of the first premise 'John said that Mary is pregnant' is true only if the content of 'Mary is pregnant' is true at a past time and at the time of speech at worlds compatible with what John said in the past in the actual world. Since the content of the embedded clauses in the premise and in the conclusion are not indexed to times or events, (A) comes out as valid. The first premise says that it was the case that John asserts the temporal proposition that Mary is pregnant. The second premise says that if it was the case that John asserts *p*, then Peter believes that *p*. From this it follows that Peter believes that Mary is pregnant.

The tense operator approach thus provides a more satisfactory account of double-access sentences than do the quantificational analyses. The quantificational analyses do not provide an explanation of why we have the intuitions concerning arguments involving double-access sentences that we do.

5.7. LOCATION OPERATORS

The aim of King's (2003) critical paper was to show, not only that there are no tense operators in English, but also that there are no location operators. Candidates for being location operators include adverbial phrases such as 'here,' 'in New York City' and 'somewhere.' In the case of 'it is raining somewhere,' for example, 'somewhere' may be thought of as a location operator on the content of 'it is raining.' However, King thinks

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said that Mary would be pregnant now. Reading the conclusion in a similar way, the argument is valid and the conclusion only requires Peter to believe that Mary is pregnant.

that the claim that locative expressions function as location operators is far-fetched. One of the examples offered by King is the following:

(16) Chris wants to go somewhere.

If 'somewhere' were an operator on the content of 'Chris wants to go,' then (16) would say that there is a place at which the content of 'Chris wants to go' is true. But this, of course, is not a possible interpretation of (16), which can only mean that there is a place to which Chris wants to go. In other words, 'somewhere' functions as an object-language quantifier over locations in (16). Cases like (16) thus provide compelling evidence against an operator treatment of locative expressions like 'somewhere.'

Of course, one might insist that 'somewhere' functions as an object-language quantifier in sentences like (16) but as a location operator in sentences like 'it is raining somewhere.' The problem with this sort of line is that it requires us to treat 'somewhere' as ambiguous, which is not very plausible. In the case of 'bank,' for example, it is a linguistic coincidence that one and the same word came to be associated with two semantically unrelated meanings. But there is an obvious semantic connection between the 'somewhere' that occurs in (16) and the 'somewhere' that occurs in 'it is raining somewhere.' 'Somewhere' does not appear to be lexically ambiguous.

There is a compelling argument for the thesis that sentences like 'it is raining' contain an unarticulated constituent (Crimmins 1992, Perry 1998). The argument runs as follows. 'It is raining' is context-sensitive in much the same way as 'John went to a local bar.' 'John went to a local bar' need not mean that John went to a bar that is local to him. With the right kind of lead-up, it might mean that John went to a bar that is local to the speaker, that John went to a bar that is local to the hearer, that John went to a bar that is local to Mary's neighbor, and so on. But 'it is raining' is not significantly different from 'John went to a local bar.' Mark Crimmins offers the following case:

> Consider the forecaster in California who says, 'Now we turn to the weather in New York. It's raining'. She has described New York, not California, as having rain. In cases like this, the very subject matter of a statement is left unmentioned in the statement. (1992: 17)

Here is another example due to Perry (1998). Suppose Rachel is on the phone with a faraway relative. She interrupts the conversation to utter 'it is raining' to people in the room waiting for news. And of course, she might be right, even if it is not raining where she is. But that is not what we should expect if 'it is raining' is truth-evaluable yet does not make implicit reference to a location.

As Cappelen and Lepore (2005, 2007) have argued, however, this argument is not without its problems. For no reason has been given for thinking that 'it is raining' cannot express a minimal proposition, namely, the proposition that it is raining. Cappelen and Lepore think 'it is raining' is true at a context *c* iff the proposition expressed by 'it is raining' is true at the world of *c*. 'It is raining' may thus be true, on their view, if uttered by someone in St. Louis in virtue of the fact that it is raining in Seattle.

That might seem counterintuitive; but, say Cappelen and Lepore, there are cases where that would be the desired result. Suppose, for instance, that you have a rain machine that reports any instance of rain around the globe.[11] The machine has a red lamp that lights up whenever it is raining. If you exclaim 'it is raining!' while pointing at the machine, the natural interpretation of your utterance is that it is raining (somewhere). Or suppose instead that the lamp lights up when, and only when, it is raining globally. In that case, if you cry out 'it is raining!' while pointing at the machine, the natural interpretation of your utterance is that it is raining (everywhere).

Interestingly, while Cappelen and Lepore's position is squarely at odds with the claim that there are implicit location variables in the sentence structure of minimal sentences, their view is compatible with the claim that there are no location operators in English. If Cappelen and Lepore are right, then there cannot be any non-redundant location operators. For, on their view, sentence content determines a function from worlds to truth-values. That being so, any location operator operating on that kind of content would be semantically redundant.

However, despite the relative merits of the arguments made by Crimmins, Perry, King, Cappelen and Lepore, I think the case against the thesis that there are location operators in English is far from decisive. Crimmins' weather report case and Perry's telephone case could perhaps be explained by appeal to free circumstance shifts, in the sense of Recanati (2004), and King's worries about a possible ambiguity in 'somewhere' could perhaps be explained as a kind of polyseme or alternatively as a semantic indeterminacy at the level of the lexical entry for 'somewhere' (Chomsky 1970). There is no need to worry about the differences in the interpretation of 'run' as it occurs in 'John runs five miles every day' and in 'John runs his own company.' Nor is there reason to worry about the differences in the interpretation of 'good' on the two readings of 'I forgot how good beer tastes' (Perry 1998, ex. 2). But the same point applies to 'somewhere': If 'somewhere' were polysemous or semantically indeterminate at the level of the lexical entry, the so-called 'ambiguity' it exhibits would be no cause for concern.

What's more: the existence of location operators in the language would not rule out minimal propositions in Cappelen and Lepore's sense. The minimal proposition expressed by 'it is raining' might be a function from <world, time, location> triples to truth-values

[11] A version of the rain machine case was originally due to Recanati.

rather than a function from worlds to truth-values. 'Everywhere Sally goes, 2 + 2 = 4' would then be true just in case every actual circumstance of evaluation at which it is true that Sally goes there is such that the proposition that 2 + 2 = 4 is true. In my opinion, that would mark a significant improvement in Cappelen's and Lepore's position.[12]

However, there is no point in becoming embroiled in speculative argument as to whether or not there are location operators in English. Suffice it to say that even if there should turn out to be no location operators in English, this would have no bearing on the question of whether there are temporal operators in English. For the parallel between temporal and locative expressions is short-lived.

First, while there are plenty of location adverbials, for instance, 'here,' 'in New York City,' and 'somewhere,' the simple past and future tenses have no locative counterparts.

Second, with the right kind of lead-up, unembedded occurrences of 'it is raining' can be true, even if it is not raining where the speaker is. This is not so for unembedded occurrences of sentences like 'John is a firefighter.' With very few exceptions, unembedded occurrences of 'John is a firefighter' can be true only if John is a firefighter at the time of speech, the only exceptions being 'literary' uses (e.g., 'It is 1946. John is a firefighter, and he and Mary are expecting their second child.').[13] Standard semantics can thus accommodate the feeling that 'John is a firefighter' expresses a complete proposition only if a time is supplied. For the proposition which standard semantics takes 'John is a firefighter' to express is true only if John is a firefighter at the time of speech (or the time of a shifted circumstance). But standard semantics cannot as easily accommodate the feeling that 'it is raining' expresses a complete proposition only if a location is supplied.

5.8. SIGNPOST

Reviving Priorian tense logic may seem like a project doomed to fail. The evidence against it seems to be overwhelming. However, I have shown that Priorian tense logic can handle some of the most widely cited evidence against it and argued that it provides a better account of Partee sentences and double-access sentences than obvious alternative theories. Priorian tense logic entails that there are intensional operators that operate on temporal content, as required by the fifth condition on propositions. So if Priorian tense logic offers a good account of the tenses in English, which it seems that it does, then that is further evidence for favoring temporalism over eternalism.

[12] MacFarlane (2007a) makes the same point.

[13] We can, of course, also ask questions about what is going on in different contexts of use. Crimmins offers the following example: 'When a friend phones me long distance, and I ask what time it is, I am inquiring about the time zone she is in . . . my assumption—an extremely good bet—is that she is on earth, and is in a single time zone throughout the conversation (rather than, say, on a spinning carousel at the North Pole)' (1992: 159).

6

EMBEDDING UNDER TENSE OPERATORS

David Kaplan was one of the most vivid supporters of the view that there are temporal contents which tense operators operate on. The position is articulated in 'Demonstratives' (1989), which at the time of its publication had been in circulation for almost twenty years. Kaplan is primarily concerned with the content of sentences, and not so much with the objects of propositional attitudes. He argues that unless the content of sentences can sometimes change its truth-value across time, we cannot account for the semantic workings of tense operators.

The position that the truth-value of sentence content may be sensitive to time shifts does not by itself qualify as temporalism. This only shows that temporal contents satisfy one of the criteria for being a proposition, namely the condition that there are intensional operators that operate on propositions. If there are tense operators in English, then Kaplan's argument succeeds in establishing that temporal contents satisfy the condition that there are contents that some intensional operators operate on. Since we have already argued that temporal content satisfies the other conditions for being a proposition, we could take Kaplan's argument to show that temporal contents are propositions.

In response to Kaplan's argument, several eternalists have defended the view that sentences have two kinds of content, temporal and eternal content, but that only eternal content has proposition-status. The two kinds of content are also known as 'compositional content' and 'assertoric content.' Rather than simply referring back to the general objections to eternalism provided in the first three chapters, I shall here offer independent arguments against each of the double-content strategies.

6.1. KAPLAN'S ARGUMENT

The main argument Kaplan offers in favor of this position runs as follows:

Kaplan's Argument

(1) There are non-redundant tense operators in English.
(2) Tense operators operate on propositions.

(3) Tense operators that operate on eternal propositions are semantically redundant.
(4) Hence, tense operators operate on temporal propositions.
(5) Hence, there are temporal propositions.

Kaplan takes premise (1) to be empirically evident. In Kaplan's opinion, premise (2) is relatively innocent as well. It should be said, however, that Kaplan does not insist on the term 'proposition.' In fact, his use of scare quotes reflects his 'feeling that this is not the traditional notion of a proposition' (1989: 503). However, the claim that tense operators operate on content rather than, say, linguistic meaning is an important corollary of the theory of 'Demonstratives.'

Premise (3) is the key premise of the argument. The argument for premise (3) runs as follows. Consider a sentence containing a past-tense operator, such as:

(1) It has been that John is a firefighter.

The past-tense operator 'it has been that' shifts the time feature of the circumstance at which the content of sentence (1) is evaluated from the time of speech to some time in the past. If, however, the content of 'John is a firefighter' were eternal, it would have the same truth-value with respect to any time of evaluation. So 'it has been that John is a firefighter' would have the same truth-value as the operand sentence 'John is a firefighter,' which is to say that 'it has been that' would be semantically redundant. The argument is nicely summarized in this footnote from 'Demonstratives':

> Technically, we must note that intensional operators must, if they are not to be vacuous, operate on contents which are neutral with respect to the feature of circumstance the operator is interested in. Thus, for example, if we take the content of S to be [eternal], the application of a temporal operator to such a content would have no effect; the operator would be vacuous. Furthermore, if we do not wish the iteration of such operators to be vacuous, the content of the compound sentence containing the operator must again be neutral with respect to the relevant feature of circumstance. This is not to say that no such operator can have the effect of *fixing* the relevant feature and thus, in effect, rendering subsequent operations vacuous; indexical operators do just this. It is just that this must not be the general situation. A content must be the *kind* of entity that is subject to modification in the feature relevant to the operator. (1989: 503–4, note 28)

Tense operators must operate on contents whose truth-value varies with the feature shifted by the operator. Otherwise, they are semantically redundant. Since the truth-values of

eternal propositions do not vary with time, tense operators that operate on eternal propositions are semantically redundant. Hence, if there are non-redundant tense operators in the language, then they operate on temporal propositions.

6.2. OBJECTIONS TO KAPLAN'S ARGUMENT

Several affirmed eternalists, including Stalnaker (1970), Michael Dummett (1991), David Lewis (1980), Mark Richard (1981, 1982), Nathan Salmon (1986, 1989, 2003), Jason Stanley (1997a, 1997b) and Jeffrey King (2003), have offered objections to this argument for temporalism. There are two main lines of reply. One sort of reply—favored by Stalnaker (1970) Dummett (1991), Lewis (1980), Richard (1981, 1982), Salmon (1986, 1989, 2003) and Stanley (1997a, 1997b)—is to reject premise (2), namely the assumption that tense operators operate on propositions.[1] Most of those who favor this sort of reply, including Stalnaker (1970),[2] Dummett (1991), Salmon (1986, 1989) and Stanley (1997a, 1997b), have argued that we need to distinguish between two kinds of content that a sentence can have: compositional and non-compositional.[3] Lewis (1998 [1980]) offers a one-step procedure for determining the truth-value of a sentence. I return to Lewis' suggestion below.

The Two-Content Strategy

Non-compositional content is what traditionally has been called a 'proposition'; it is what speakers actually assert when they utter a sentence, it is the object of agreement and disagreement, the object of possible belief, and so on. Compositional content is, as King puts it, 'the semantic contribution sentences relative to contexts make to the semantic values relative to contexts of larger sentences in which they occur' (2003: 200). Following Dummett (1991, chap. 9), the two kinds of content are also known as 'assertoric content' and 'ingredient sense' (see Stanley 1997a, 1997b). As the names suggest, the assertoric content is non-compositional, and the ingredient sense is compositional.

To say that assertoric content is non-compositional is not to say that it is not a function of the ingredient senses. It is indeed. For instance, the assertoric content of a sentence like 'it will always be the case that Bush is the current president' relative to a

[1] As we will see, Stanley's chief concern is not to block Kaplan's argument but I include him here because he is an advocate of the following two theses: (i) Assertoric content is eternal, and (ii) assertoric content and compositional semantic values may come apart.

[2] I am here appealing to Lewis' (1998 [1980]) take on Stalnaker (1970).

[3] The terminology is from Stanley (1997a). Salmon (1989) calls non-compositional content the 'information content,' Dummett (1991: chap. 9) calls it the 'assertoric content,' and Lewis (1980) calls it the 'proposition.'

context is a function of the ingredient sense of the embedded sentence 'Bush is the current president' relative to that context. But the ingredient sense of a sentence in context does not always fully determine the assertoric content of the sentence relative to that context.

Notice that even if eternalism is true, the distinction between assertoric content and ingredient sense is not exactly parallel to that between temporal and eternal content. For ingredient senses need be neither temporal nor contingent. We can, after all, embed 'John is now hungry' in a tensed context. However, as the ingredient sense of this sentence happens to be eternal, its assertoric content simply turns out to be its ingredient sense (setting aside other possible differences between semantic value and assertoric content).

The double-content maneuver, as we might call it, blocks Kaplan's argument. For Kaplan's argument does not show that temporal propositions are objects of possible belief, objects of possible agreement and disagreement, and so on. It only shows that the content operated on by tense operators must be capable of having different truth-values at different times. If one takes tense operators to operate on non-propositional content, one can therefore agree with Kaplan that tense operators operate on temporal content *and* deny that propositions are temporal.

There are, however, a couple of potential worries about the double-content strategy. Stanley (1997a, 1997b) has argued that the assumption that there may be a difference between assertoric content and ingredient sense requires us to reject Saul Kripke's (1980) modal argument for what Stanley calls the *Rigidity Thesis* (1997b: 137):[4]

> The Rigidity Thesis
> If t is rigid, and t' is non-rigid, for any two sentences S and S' which differ only in that t occurs in the former where t' occurs in the latter, any utterance of S and any utterance of S' have different assertoric content.

Kripke's modal argument is familiar. Consider, for instance:

> (2)
> (a) Socrates is the teacher of Plato.
> (b) The teacher of Plato is the teacher of Plato.

Sentences (2a) and (2b) have different modal profiles: whereas (2a) expresses a proposition that is contingently true, (2b) expresses a proposition that is necessarily true.

[4] Stanley offers several formulations of the Rigidity Thesis. This is one of them, barring some minor changes I have made.

Since (2a) and (2b) have different modal profiles, they have different contents. Or so the argument goes.

Stanley has two related arguments for questioning the Rigidity Thesis (1997a, 1997b). I shall look at the argument presented in (1997a) first and then turn to the one presented in (1997b) next. Stanley's (1997a) argument is meant to illustrate that the Rigidity Thesis 'is not as innocent as many philosophers believe,' and that 'the classic Kripkean argument in its favor fails' (1997a: 578). However, since the argument rests on the assumption that there is a distinction to be made between assertoric content and ingredient sense, the argument can also be construed as an argument to the effect that friends of the Rigidity Thesis must question the very distinction between eternal assertoric content and temporal content.

The problem Stanley (1997a: 574f) envisages for friends of the Rigidity Thesis who already distinguish between assertoric and temporal content is this. If the semantic values that (2a) and (2b) are used to assert relative to contexts are non-compositional but the semantic contributions (2a) and (2b) make to the semantic values of sentences in which they occur are compositional, then the Rigidity Thesis is in trouble. For, according to Stanley, the modal profile of (2a) and (2b) that our intuitions track may well be a property of the compositional semantic values rather than a property of the assertoric contents. In other words, for all our intuitions tell us, (2a) and (2b) express, relative to a context, the same assertoric content in spite of having different semantic values. So Kripke's argument for the Rigidity Thesis is invalid.

To see the force of Stanley's objection let us lay out the details of the argument. Consider the following pairs of sentences taken from Stanley (1997a: 575):

(3)
(a) The president is Bill Clinton.
(b) The current president of Bill Clinton.
(c) The president here is Bill Clinton.
(d) The actual president is Bill Clinton.

According to Stanley, these sentences have the same assertoric content. The difference between these sentences, when they are asserted, is merely pragmatic. As Stanley puts it,

> In each of [(3b)-(3d)], a presupposition is present which is not present in [(3a)]. But these presuppositions are cancelable. The sentences can be true, even if the presuppositions fail. Indeed, in any context *c*, an utterance of each of [(3b)-(3d)] has the same truth-conditions as [(3a)], and hence has the same assertoric content as [(3a)]. (1997a: 575)

But in spite of having the same assertoric content, the sentences in (3) have different semantic values. Consider, for instance:

(4)
(a) It will be the case that the current president is Bill Clinton.
(b) It will be the case that the president is Bill Clinton.

On the assumption that 'it will be the case that' is a tense operator, the compositional semantic values of the operand sentences is evaluated with respect to a future time. But the semantic value of 'the current president of Bill Clinton' is eternal: It has the same truth-value at all times. The semantic value of 'the president is Bill Clinton,' on the other hand, is temporal; it has different truth-values at different times. The same holds for:

(5)
(a) Necessarily, the actual president is Bill Clinton.
(b) Necessarily, the president is Bill Clinton.

Since the actual president was Bill Clinton in 1997, (5a) happens to be true if asserted in 1997. For, there is no world in which the actual president in 1997 is someone other than Bill Clinton. But (5b) is false; there are worlds where the president in 1997 is someone other than Bill Clinton. So Stanley concludes that 'it could be the case that sentences with the same assertoric contents have different ingredient senses' (1997a: 575). But consider now the sentences in (2):

(2)
(a) Socrates is the teacher of Plato.
(b) The teacher of Plato is the teacher of Plato.

To determine the modal profiles of (2a) and (2b) we must consider the sentences embedded in modal contexts. The conclusion of Kripke's argument is that (2a) and (2b) 'embed differently in different modal contexts' (Stanley 1997a: 576). But the fact that (2a) and (2b) embed differently shows that (2a) and (2b) have different compositional semantic values; it doesn't show that (2a) and (2b) have different assertoric contents. For as we just saw, sentences with the same assertoric contents can have different semantic values. In formulating his modal argument Kripke employs the following sort of language:

(6)
(a) t = t. That's necessary.

(b) t = t′. That's not necessary.

For Kripke's argument to get off the ground, Stanley says, the two occurrences of 'that' *must* refer to the assertoric contents of the preceding sentences. For if they refer to the semantic values of the preceding sentences, the argument fails, as the semantic values can differ even if the assertoric contents are the same. Since Kripke's argument doesn't show that the two occurrences of 'that' refer to the assertoric content, it fails to establish the Rigidity Thesis. So, as King (2003: 198) puts it, if the Rigidity Thesis is right, then the distinction between eternal assertoric content and temporal semantic value is on shaky grounds.

Stanley's (1997a) argument is forceful. A friend of the Rigidity Thesis might insist that assertoric contents are the primary bearers of properties such as *contingency*, *necessity*, *possibility* and so on. But that is exactly what is at issue here. Kripke's argument doesn't show that it is assertoric contents rather than semantic values which are the bearers of these properties.

It is, however, questionable whether Stanley's (1997a) argument can be used to refute the very distinction between assertoric content and semantic value. For the Rigidity Thesis may well be right, even if Kripke's modal argument fails. In other words, I would hesitate to attribute an inconsistency to those who assent to both the Rigidity Thesis and the assertoric content/compositional semantic value distinction. So, pace King, Stanley's (1997a) argument, however convincing, does not by itself allow us to reject the distinction between assertoric content and compositional semantic value on the grounds that we think the Rigidity Thesis is correct.

However, in "Rigidity and Content" Stanley offers a different version of the (1997a) argument. Stanley here argues that assertoric content quite plausibly obeys what he calls the 'Expression-Communication Principle' (1997b: 136):[5]

> Expression-Communication Principle
> If an utterance *u* of a sentence *S* and a different utterance *u′* of another sentence *S′* have different assertoric content, then, generally, for any normal context *c*, had *S* and *S'* been uttered in *c*, they would have communicated different things.

[5] This is a simplified version of the principle that occurs in (2002: 329). The principle in (2002) is a biconditional and assumes that the contexts agree on assignments to contextually sensitive items, that it is common knowledge that the speakers understand the terms, that the speakers know the values of context-dependent elements in the sentences relative to context, and that the speakers intend to speak literally and in according with the maxim of Manner. Somewhat related principles appear in Soames (2002, 2004, forthcoming).

By 'normal context' Stanley means a context where 'the speakers are competent with all of the words in the sentences being uttered, and the sentence is used as it standardly is' (1997b: 136). I think the Expression-Communication Principle looks very plausible. To see its plausibility consider:

(7)
(a) After the lecture, the students asked questions.
(b) After the lecture, some of the students asked questions.

In any normal context, utterances of (7a) and (7b) communicate the same things, and, in spite of the fact that (7a) and (7b) have different compositional semantic values, utterances of (7a) and (7b) normally have the same assertoric content. This, of course, does not show that the Expression-Communication Principle is right, but if it is right, then we have a further reason to believe that (7a) and (7b) may express, relative to a context, the same assertoric contents in spite of having different semantic values.

If the Expression-Communication Principle is right, which it probably is, then a stronger case can be made against the Rigidity Thesis. Consider again:

(3)
(a) The president is Bill Clinton.
(d) The actual president is Bill Clinton.

These expressions no doubt communicate the same thing in normal contexts. As Stanley points out, the difference is one of '"colouring," or "tone," like the difference between typical unphilosophical usages of "truth" and "absolute truth"' (1997b: 137). But if they communicate the same thing in normal contexts, and the Expression Communication Principle is right, then they have the same assertoric content relative to those contexts.

Stanley offers several other examples. For instance, suppose I introduce the name 'Julius' to talk about whoever happens to be the actual inventor of the zip. Then it would seem that the name 'Julius' refers to the actual inventor of the zip. But the following sentences communicate the same things in normal contexts:

(8)
(a) The inventor of the zip was born in New York.
(b) Julius was born in New York.

So by the Expression-Communication Principle, they have the same assertoric content.

These examples cast doubt on the Rigidity Thesis. For (3a) and (3b) have the same assertoric content; yet they differ only in that a non-rigid term occurs in the former

where a rigid term occurs in the latter. Similar remarks apply to (8a) and (8b). Stanley's argument, if successful, shows that one cannot coherently assent to both the Rigidity Thesis and the distinction between assertoric content and compositional semantic value.

How might a friend of these two theses respond? Well, there are several options. As Stanley points out, she might 'maintain that despite intuitions to the contrary, rigidity and non-rigidity, *by themselves*, make a difference to what is communicated' (Stanley 1997b: 139). Alternatively, she might 'claim that the occurrence of a rigid term in an utterance of one sentence, and a non-rigid term in an utterance of another, is sufficient to conclude that the assertoric contents are different, even if utterances of the sentences typically communicate the same thing' (139). The second reply involves rejecting the Expression-Communication Principle.

Unlike the first reply, the second reply has some degree of initial plausibility. But Stanley has a comeback that makes it look unattractive. Rejecting the Expression-Communication Principle deprives the very distinction between assertoric content and compositional semantic value of plausibility. For example, if sentences that typically communicate the same thing may have different assertoric content, then there is little basis for saying that tensed sentences, when asserted, have eternal assertoric content in spite of the fact that their semantic values are temporal. The appearance that utterances of 'John is running' and 'now, John is running' in normal contexts communicate the same thing could simply be taken to show that utterances of these sentences normally communicate the same thing. But it would not follow that the sentences normally have the same assertoric content.

However, I believe that there is a third reply available to defenders of the Rigidity Thesis and the assertoric content/semantic value distinction. It runs as follows. Stanley has not ruled out the possibility that (3a) and (3d) have the same semantic value. They might have the same semantic value because 'actual' functions differently in technical philosophy and ordinary language. In ordinary language, 'actually' certainly is not a strict indexical expression like 'now' or 'I.' For, as Cappelen and Lepore (2003) point out, strict indexicals like 'now' resist disquotation. The following claim, for example, is far from obviously true (Cappelen and Lepore 2003):

> If John spoke truly when he said 'I am hungry now', then he is hungry now.

The corresponding claim containing 'actually' in place of 'now,' on the other hand, seems obviously true.

> If John had spoken truly when he said 'I am actually hungry', then John would actually have been hungry.

But if 'actually' were the modal equivalent of 'now,' then we should expect it to behave in the same way as 'now.' That is, if the content of 'actually' returns us to the world of speech, then the non-reported occurrence of 'actually' in the consequent takes us to the actual world, whereas the reported occurrence of 'actually' takes us to a non-actual world. Thus, we should not expect the claim to be obviously true.

Notice that it does not help to insist that our intuitions about these cases track properties of assertoric content rather than compositional semantic value. For, that does not explain the differences between 'now' and 'actual.' So it would seem that 'actually' does not function as a strict indexical in ordinary language. Quite plausibly it does not make any semantic difference in ordinary language. This is not to say that it does not have a technical philosophical usage, but only that it is not simply obvious that ordinary speakers use it that way. If they do not, then (3a) and (3d), as they are ordinarily used, contain no rigid terms and so are not counterexamples to the Rigidity Thesis.[6]

Similar remarks apply to (8a) and (8b). Stanley's argument rests on the assumption that ordinary-language occurrences of descriptive proper names are rigid terms. But that is a controversial thesis. Robin Jeshion (2004) defends a weakened version of it. But the majority view is that descriptive names in ordinary language function semantically as descriptions (see e.g., Reimer 2004). If, however, descriptive names function as descriptions, then (8a) and (8b) both contain non-rigid terms and so are not counterexamples to the Rigidity Thesis But if there is no obvious tension between the Rigidity Thesis and the assertoric content/semantic value distinction, then, pace King, Stanley's objection cannot be used to argue against the double-content strategy.

We can, however, set forth a strengthened argument against the double-content strategy. The main reason that some philosophers distinguish between assertoric content and compositional semantic value is that they hold the following two theses: (i) There are non-redundant tense operators in the language, and (ii) the content of what is asserted, believed, doubted, and so on is eternal. As we saw in Chapter 3, the thesis that A and B believe or assert the same thing only if the things asserted or believed do not have different truth-values entails (ii). But, as we also saw in Chapter 3, if the objects of belief and assertion can have different truth-values at different worlds, then this conditional is false. For then A and B can believe the same thing, even though A believes something true and B believes something false. We only need to place A and B in different possible worlds. So if one really does have strong intuitions to the effect that A and B cannot assert or believe the same things unless the things asserted have the same truth-value, then one ought to take assertoric content

[6] According to Kripke, names like 'Julius' are rigid designators those actual referent was fixed by description. However, it is not obvious that there are descriptive names that function that way in ordinary language. If there are names that function that way, then arguably substituting the description used to fix the reference of the name for the name changes the assertoric content.

to be absolute. One and the same assertoric content, then, cannot have different truth-values at different worlds.

But now Stanley's argument is up and running again. Consider again:

(2)
(a) Socrates is the teacher of Plato.
(b) The teacher of Plato is the teacher of Plato.

Although (2a) and (2b) have different modal profiles, if assertoric content is absolute, then the modal profiles of (2a) and (2b) cannot be properties of the assertoric content but must be properties of the ingredient senses. But then Kripke's modal argument does not show that (2a) and (2b) have different assertoric contents. Consequently, the modal argument fails.

There is another more devastating consequence for friends of the Rigidity Thesis. If assertoric content cannot have different truth-values at different circumstances, then (2a) and (2b) have exactly the same assertoric contents, and so do 'Socrates' and 'the teacher of Plato.' So the Rigidity Thesis is false. Something must go.

The strength of this argument, construed as an argument against the double-content strategy, will depend on whose position is under scrutiny. Salmon (1989), for example, is in favor of the Rigidity Thesis; so the strengthened version of Stanley's argument requires Salmon to rethink the distinction between assertoric content and compositional semantic value. But Stanley (1997a, 1997b) himself rejects the Rigidity Thesis. So the argument has no effect on his position. Stanley can insist that what is asserted, believed, doubted and so on is a world-and time-indexed proposition, and take tense operators to operate on (temporal) ingredient senses. To call Stanley's own position into question we would need a different argument.

One argument against distinguishing between assertoric content and ingredient sense is that the approach gets complicated when 'believe' occurs under a tense operator. To account for sentences where 'believe' occurs under a tense operator, eternalists like Salmon (1986) must introduce additional complications. To see this, consider:

(9) In 2030 it will be the case that George Bush believes Hillary Clinton is president.

On the most natural reading, (9) is true only if the time of believing is the same as the time Hillary is believed to be president. But (9) also has a reading where the time Hillary is believed to be president overlaps the time of speech and a reading where the time Hillary is believed to be president is later than the time of speech but earlier than the time of

believing. The later-than-speech reading is salient in the following context: 'Bush won't believe it when Hillary is president (i.e., say, in 2010), but he will believe it later.'[7]

But if the tenses are sentential operators, then the content of the belief report that occurs in the scope of the tense operator must be temporal. Since Salmon denies that 'believe' operates on temporal content, he assumes that there is a so-called eternalization of the content that occurs under 'believe.' On the first reading of (9), the content of the sentence that occurs under 'believe' would become indexed to the time of believing; on the second reading of (9), the content of the sentence that occurs under 'believe' would become indexed to the time of speech; and on the third reading, the content of the sentence that occurs under 'believe' would become index to some time that lies between the time of speech and the time of believing.[8] On Stanley's account, we would need to index the content to times and worlds. Several clauses are thus required to account for eternalization. I agree with King (2003: 210) that this is unnecessarily complicated.

King's account can easily handle the two readings of (9) without any additional complications. But so can temporalism. To see this, consider the following sentence.

(10) George Bush believes that Hillary Clinton is president.

Treating 'believe' as an intensional operator the temporalist can assign the following metalinguistic truth-conditions to (10):

(10a) For all worlds w compatible with what George Bush believes at <@, t^*>, Hillary Clinton is president at <w, t^*>

where t^* is the time of speech, and @ is the actual world. Sentence (9) can be treated along the same lines. Even though the temporalist will treat (9) as expressing the same proposition in all contexts, three different truth-conditions are needed to account for the different readings, namely (ignoring in '2030'):

(9a) There is a future time t such that, for all worlds w compatible with what George Bush believes at <@, t>, *Hillary Clinton is president* is true at <w, t>.
(9b) There is a future time t such that, for all worlds w that are compatible with what George Bush believes at <@, t>, *Hillary Clinton is president* is true at <w, t^*>.
(9c) There is a future time t such that, for all worlds w that are compatible with what George Bush believes at <@, t>, $\exists t'(t' < t \ \& \ t^* < t' \ \&$ *Hillary Clinton is president* is true at <w, t'>).

[7] The example is due to Mike Almeida.
[8] Salmon (1986) deals only with the first reading.

On the first reading, then, (9) requires for its truth that the temporal content of George's belief is true at worlds where Hillary's presidency overlaps the time of believing. On the second reading, (9) requires for its truth that the temporal content of George's belief is true at worlds where Hillary's presidency overlaps the time of speech. And on the third reading, (9) requires for its truth that the temporal content of George's belief is true at worlds where Hillary's presidency is later than the time of speech but earlier than the time of believing (as in 'Bush won't believe it when Hillary is president (i.e., say, in 2010), but he will believe it later').

But how do we account for the availability of the three readings if temporalism is true? Well, it is easy to account for the different readings given the account of belief set forth in Chapter 2. On this account, the very same belief report may describe different beliefs depending on the ascriber's intentions in the particular context. Since the proposition expressed by the operand sentence 'George Bush believes that Hillary Clinton is president' in (9) is a description of what is believed rather than the thing believed, it may pick out different beliefs in different contexts.

In sum: The temporalist account of belief reports in temporal contexts is a natural extension of the temporalist account of unembedded belief reports. No ad hoc stipulations are required. So prima facie at least, temporalism seems preferable to eternalist approaches that also treat the tenses as operators.

Lewis' One-Step Approach

Lewis (1998 [1980]) offers an alternative to the eternalist approaches just considered. He takes tense operators to be sentential operators but suggests that the truth-value of a sentence is determined by a pair of a context and a circumstance (or what he calls an index). The semantic value of a sentence is a function from a context and an index to a truth-value. Sentential operators shift the time feature of the index, and the whole sentence is true iff the operand sentence is true at the context and the shifted index.

The semantic value of a sentence, Lewis says, is compositional: It is a function of the semantic values of the constituents of the sentence. The proposition expressed by the sentence relative to a context is not compositional, for it need not be the same as the sentence's semantic value. The proposition of a sentence *S* in context *c* is 'that proposition that is true at world *w* iff *s* is true at *c* at the index . . . that results if we take the index I_c of the context c and shift its world coordinate to *w*' (Lewis 1998 [1980]: 38). For instance, the proposition expressed by (9) relative to a context *c* is the proposition that is true at a world *w* iff (9) is true at *c* and *w* and the time of *c*. Notice that on this account a proposition will be a set of worlds. The proposition expressed by (9) at 6 p.m. Dec. 24 2005 will be the set of worlds where 'Hillary will be president' is true at Dec. 24, 2005.[9]

According to Lewis, there seems to be little to choose among his view and the view that takes semantic values to be functions from worlds and times to truth-values. As he puts it:

> Given the ease of conversion, how could anything of importance possibly turn on the choice between our two options? Whichever sort of assignment we are given, we have the other as well; and the assigned entities equally well deserve the name of semantic values because they equally well do the jobs of semantic values. . . . How could the choice between the options possibly be a serious issue. (1998 [1980]: 35–6)

If Lewis is right that nothing of importance turns on the choice between the two options, then the previous considerations will apply to Lewis' view as well. However, I do not think Lewis is right. Lewis' approach works great in the simple cases, but I do not think it will work in more complicated cases. Take, for instance:

(10) It will be the case forty years from now that I am president.

Intuitively, (10) is true if the utterer is president forty years after the time of speech. But this is not what Lewis' account gives us. The tense operator is what we called a 'composite tense operator' in Chapter 4; it shifts the time of the index from the time of speech to a time that is forty years from now. But what does it shift on Lewis' account? The answer is that it cannot shift anything. For we have not applied context yet. Context enters the picture only later. So the temporal prefix 'It will be the case forty years from now that' is left uninterpreted. We could, of course, apply context and then let the tense operator shift the index. But then Lewis' account would not be a one-step method

[9] One might wonder why Lewis didn't insist on getting rid of the times in the definition of propositions. He could, for example, have taken the tenses to be indexical expressions but modal expressions to be sentential operators. 'Proposition' could then be defined as follows. The proposition of a sentence *S* in context c is that proposition that is true at world *w* iff *S* is true at *c* and at the index *w*. However, this view would not be very attractive. Let us consider an example:

(i) It is possible to travel faster than the speed of light

The proposition expressed by (i) relative to a context *c* is the proposition that is true at a world *w* iff (i) is true at *c* and the world of *c*. So the proposition expressed by (i) relative to *c* will be the world of *c*. If (i) is uttered at the actual world, the proposition will be the actual world. This variation on Lewis' approach is even simpler than Lewis' own. But he didn't go for it, probably because it is difficult to believe that the assertoric content of all sentences uttered in the actual world is just the actual world.

for calculating truth-value. We would need to apply context first and then determine the truth-value of the embedded sentence at the shifted index.

How might Lewis reply? Well, he might deny that surface form is a reliable indicator of logical form. In particular, he might insist that (11) should be understood as:

(10a) It will be the case that (I am president forty years from now).

But notice that if we keep context constant, then the operand sentence 'I am president forty years from now' will have the same truth-value relative to any index. So if (10a) is an adequate paraphrase of (10), then the tense operator 'it will be the case that' is semantically redundant.

Let us consider another example, for instance:

(11) It will be the case at 6 p.m. Dec. 24, 2045, that I am president.

If (10a) is an adequate paraphrase of (10), then (11a) below is an adequate paraphrase of (11).

(11a) It will be the case that (I am president at 6 p.m. Dec. 24, 2045).

But keeping the context constant 'I am president at 6 p.m. Dec. 24, 2045' will have the same truth-value relative to any index. So if (11a) is an adequate paraphrase of (11), then the future tense operator 'it will be the case that' is semantically redundant here as well.

Similar remarks apply to a sentence like:

(12) I didn't turn off the stove.

As we have already seen, (12) is not normally true in virtue of the fact that the speaker didn't turn off the stove fifteen years ago. Rather, there is an implicit contextual restriction, for instance 'I didn't turn off the stove [after using it this morning].' But if Lewis' account is right, then 'after using it this morning' cannot be a restrictor of the tense operator, but must be a temporal adjunct sitting on the embedded sentence. So Lewis must be prepared to give the following paraphrase for (12):

(12a) It was the case that (I do not turn off the stove after my using it this morning)

But keeping context constant 'I do not turn off the stove after my using it this morning' will have the same truth-value relative to any index. So the past tense operator 'it was the case that' is semantically redundant here as well.

It turns out then that if Lewis is right, then most of the tenses in English are semantically redundant. Of course, I might say 'people will inhabit the moon' and really mean for it to be temporally unrestricted. But such cases are rare. So if Lewis is right, then, as a rule, the tenses in English are semantically redundant. I think this is a dire consequence better avoided.

Tense Operators on Linguistic Meaning

Most of those who reject premise (2) of Kaplan's argument, namely that tense operators operate on propositions, think that sentences have two kinds of content: assertoric content and ingredient sense. But, as Mark Richard (1982) has argued, this is not the only way to reject this premise.[10] Richard (1982) thinks that we should take intensional operators to operate on linguistic meaning. The linguistic meaning of a sentence is the meaning the sentence has independently of being uttered in a particular context.

The difference between linguistic meaning and content is most salient in the case of indexicals, such as 'I,' 'now,' and 'here.' Following Kaplan (1989), the linguistic meaning of 'I' is a function from context to content. Relative to a context *c*, 'I' is assigned the speaker in *c* as its content. Kaplan (1989) familiarly calls the linguistic meaning of an expression its 'character.'

On Richard's proposal, the tense operator 'it was the case that' in 'Nixon was president' shifts the linguistic meaning of the operand sentence 'Nixon is president.' The operand sentence 'Nixon is president' is true at a context *c* iff Nixon is president at a time *t* that is past relative to *c*. Richard states that the semantic value of 'Nixon was president'

> is the result of applying a function from meanings to meanings (that associated with 'it was the case that') to the meaning of 'Nixon is president.' We would say that the complex sentence is true, taken relative to context *c*, exactly if its semantic value—its meaning, constructed as indicated above—yields, when applied to *c*, a true proposition. (1982: 343)

At first glance, Richard's claim that modal operators and tense operators operate on linguistic meaning rather than content seems to cause trouble. Consider, for instance:

> (13) It will be the case that I am happy that I am writing now.

[10] See also Thomas Sattig (2006: 10–11).

The future tense operator 'it will be the case that' shifts the time feature of the default circumstance of evaluation determined by the context of use to some time in the future. But if 'it will be the case that' operates on linguistic meaning, then it is not the speaker's context that determines which proposition is expressed by (13); rather, what determines which proposition is expressed is a sequence of contextual parameters some of which are shifted. For example, (13) is assigned a proposition relative to a context whose time feature is shifted to some time in the future. So we should expect (11) to have the same meaning as 'it will be the case that I am happy that I am writing hence.' But it does not.

Richard is aware of this as a potential problem. He suggests that time indexicals 'freeze' the content of the clause in which they occur. As he puts it, a presentation of the meaning of tensed English sentences

> must allow the operator 'now' the ability to 'freeze' the content of those sentences to which it is prefixed, allowing such sentences to continue to express, when embedded, the same proposition they express when they are not so embedded. (1982: 347)

If we freeze the content of 'I am writing now,' (13) winds up having the meaning it would if 'it will be the case that' were an operator on content.

One advantage of Richard's account is that there is just one kind of content: Propositional. After all, the linguistic meaning of a sentence is not an additional level of content.

King (2003: 208) calls attention to a potential problem for Richard's account. Because Richard is an eternalist, he takes the objects of the attitudes to be eternal propositions. The objects of the attitudes thus differ from the meanings tense and modal operators operate on. So we should expect the following apparently valid argument to be invalid:

> (A)
> Shannon believes that God exists.
> It is possible that God exists.
> Therefore, Shannon believes something that is possibly true.

If 'so-and-so believes that "operates" on propositions and 'it is possible that' operates on linguistic meaning, then it would seem that the inference in (A) should fail to go through. But (A) is obviously valid.

There is another, more serious, problem with Richard's view. On Richard's view, 'the function of the operator "now" is to "freeze" the content of a sentence to which it is prefixed' (1982: 347). But there are other (pure or impure) temporal indexicals besides

'now,' for example, 'this morning,' 'two days ago,' 'tomorrow,' 'last spring,' 'next year,' 'on Wednesday,' 'eight days from now,' 'in April,' and so on. As we saw in Chapter 4, the basic tense operators combine with temporal indexicals to form composite tense operators. But such composite tense operators make trouble for Richard's account. Just as cases like

(13) It will be the case that I am happy that I am writing now.

cause trouble for Richard's account if 'now' does not freeze the time at which content of 'I am writing' is evaluated, so cases like

(14) It will be the case that I am happy that I was writing yesterday.

cause trouble for Richard's account if 'it was the case yesterday that' does not freeze the time at which the content of 'I am writing' is evaluated. If 'it was the case yesterday that' is not given special treatment, (14) will be true iff it will be the case at some future time *t* that I am happy that I was writing the day before *t*.

So just like 'now,' the operator 'it was the case yesterday that' must be treated differently from the basic tense operators. A sentence to which 'it was the case yesterday that' is prefixed is true iff its content is true the day before the time of speech.

But 'it was the case yesterday that' is not an operator on linguistic meaning but an operator on ingredient senses. And the same holds mutatis mutandum for all the other composite tense operators. Richard's proposal thus succumbs to the difficulties it purports to overcome: Since composite tense operators operate on ingredient senses and 'S believes that' operates on assertoric content, Richard's account requires us to posit two kinds of content after all.

No Tense Operators

A fourth line of reply to Kaplan's argument for temporalism is to reject premise (1), namely, that there are non-redundant tense operators in English. This is, as we saw in Chapter 4, King's strategy. On King's account, the English tenses and temporal prefixes, such as 'it was the case that' and 'it will be the case that,' function as object-language quantifiers. If there are no tense-operators in English, then there is no problem in taking sentences to express eternal propositions. I have already offered some reasons to favor a Priorian tense logic to King's account. Below I will offer an argument against King's account that rests on the redundancy of the present tense. Before turning to this argument, I will offer some reasons in favor of the redundancy thesis.

6.3. THE REDUNDANCY OF THE PRESENT TENSE

It is common in the philosophical literature to distinguish between tensed and tenseless sentences. Simple embedded sentences are thought to be tenseless: The copula 'is' in the embedded sentence 'John was a firefighter,' for example, does not carry a tense inflection—not even an invisible one—it simply works as a paste that glues together the proper name 'John' and the predicate nominal 'a firefighter.' Often the sentences thought to be tenseless are simply represented by leaving out the copula altogether in the way it is done in first-order logic. In this lingo, the content of the tenseless sentence 'John is a firefighter' can be represented as 'firefighter(John).' As Quine puts it:

> We may conveniently hold to the grammatical present as a form, but treat it as temporally neutral. One does this in mathematics and other highly theoretical branches of science without deliberate convention. Thus from 'Seven of them remained and seven is an odd number' one unhesitatingly infers 'An odd number of them remained', despite the palpable fallacy of the analogous inference from 'George married Mary and Mary is a widow'. One feels the 'is' after 'seven' as timeless, unlike the 'is' after 'Mary', even apart from any artifice of canonical notation. (1960: 170)

It is widely recognized that tense operators operate on the content of tenseless sentences, not on the content of present-tensed sentences. For example, the past tense operator 'it has been that' as it occurs in 'it has been that John is a firefighter' operates on the content of a tenseless sentence, namely the sentence 'John is a firefighter.' The embedded sentence 'John is a firefighter' is thus thought to differ in fundamental respects from the superficially similar present-tensed sentence 'John is a firefighter.'

Following Arthur Prior (1957, 1967, 1968a, 1968b), there is nothing inherently wrong with the tenseless conception of sentences that occur in the scope of tense operators.[11] What is wrong with the view just presented is that it overlooks the fact that the present tense is always semantically redundant.[12] According to Prior, the content of

[11] At one place Prior even suggests that atomic propositions are in the present tense: As he puts it, 'It is not quite right to say that the formalized languages . . . have *no* present tense. The present is, on the contrary, the understood tense of any proposition that has no other specific tensing; and it is therefore the tense of the 'atomic propositions' or innermost kernels of all tensed constructions' (1968a: 173).

[12] The present tense here is taken to include the progressive, as in 'John is eating fish.' The present tense in eternal sentences like 'John is a firefighter at 3 p.m. April 5, 2006 (CST)' is of course also redundant. But that should be uncontroversial. Interestingly, Murvet Enç is currently writing a piece on the present tense, arguing that there is no such thing as present tense morphology or operator (personal communication). This seems consistent with the Priorian line.

ordinary present-tensed sentences such as 'John is firefighter' are just temporal propositions, that is, propositions that determine functions from worlds and times to truth-values.

The main reason it might be thought that there is a difference between simple embedded sentences and unembedded present-tensed sentences is that unembedded present-tensed sentences are mistakenly thought to be indexical sentences. For example, it is tempting to think that the present-tensed sentence 'John is a firefighter' expresses, in context, the same content as the indexical sentence 'John is now a firefighter.'[13] As Richard (1982: 337) puts it,

> [T]he eternalist will say that ['Nixon is president'] expresses different propositions at different times. For the eternalist, a sentence like ['Nixon is president'] contains an 'implicit reference' to a time: On his view, a use of (1), at a time *t*, expresses what a use of 'Nixon is now president' expresses relative to *t*. The second proposition, however, is eternal *viz.*, it is either always true or always false.

Salmon agrees with Richard that simple present-tensed sentences are equivalent to the result of adding 'now' to the sentence. Salmon:

> On this theory, such uses are regarded as involving an implicit use of a specific, indexical temporal operator such as 'now'. For example, sentence (1) [= 'I am busy'] standing alone would be seen as elliptical for (12) [= 'I am busy now']. . . . This account of simple present tense is exactly analogous to the treatment suggested above of simple past tense according to which a simple past-tensed sentence such as . . . 'Frege was busy', standing alone as a declarative sentence in a piece of discourse, is elliptical for a temporally indexical completion, e.g., 'Frege was busy then'. We may call this *the ellipsis theory of present tense.* (1989: 385)

Prior believed that the temptation to think that 'Nixon is now president' and 'Nixon is president' express the same proposition with respect to the same context should be resisted. He admits that there is a *sense* in which 'now' is redundant. 'Now' is redundant in the sense that it can always be paraphrased away.[14] For example, 'it is now the case that I will later be glad that I am writing now' has a paraphrase that does not contain the word 'now.' Prior explains:

[13] See also Stanley (1997b: 144–45).

[14] See also Kamp (1971: 227f).

> it is now the case that I will later be glad that I am—ing now" amounts to "it is now the case that for some proposition *p* which is true at one instant only, (i) it will be the case that I am glad that it was the case that (*p* and I am—ing), and (ii) it is now the case that *p*." Here both occurrences of "now" indicate the time of truth of the clauses in which they immediately occur, and nothing is lost if both of them are dropped. (1968: 106)

If we take the proposition p that is true at one instant only to be 'it is 3 p.m. on April 5, 2006 CST', then 'it is now the case that I will later be glad that I am writing now' amounts to 'it is 3 p.m. (CST) on April 5, 2006, and it will be the case that I am glad that it was the case that (it is 3 p.m., April 5, 2006 (CST) and I am writing).

It is tempting to think that this paraphrase couldn't possibility constitute the meaning of the sentence relative to my current context. The temptation should be resisted. Prior's work was published long before the appearance of David Kaplan's 1989 theory of indexicals. Looking back after decades of dialogue on Kaplan's theory, Prior's treatment of indexicals lacks modern sophistication. Even so, the commonalities between Prior's and Kaplan's theories are apparent. On standard interpretations of the Kaplanian framework, the content of 'now' is its referent; the content is determined (via character) by the context of use. Relative to my current context of use, 'it is now the case that I will later be glad that I am writing now' expresses the proposition that at 3 p.m. on April 5, 2006 (CST), it will be the case that I am glad that I am writing on 3 p.m. on April 5, 2006 (CST). But this is not significantly different from the aforementioned paraphrase.

There is thus a sense in which temporal indexicals like 'now' are redundant: They can be paraphrased away. But they cannot simply be omitted from the sentence in which they occur. 'It will be that I am glad that I am writing now' and 'it will be that I am glad that I am writing' mean different things. Relative to my current context, the first sentence means that it will be that I am glad that I am writing at 3 p.m. CST on April 5, 2006. The second sentence means that it will be that I am glad that I am writing hence. 'Now' is not superfluous.[15] As 'now' is not superfluous, the main motivation behind distinguishing between tensed and tenseless sentences that appear to be in the present tense is lacking in force. As I will argue in the next section, if 'now' is not redundant, a tensed sentence without 'now' may expresses exactly the same content as the corresponding "tenseless" sentence. So the redundancy theory of the present tense is true.

[15] See also Kamp (1971: 229).

6.4. MONSTERS

Kaplan made the point that 'now' is not redundant exceedingly explicit. Like other indexicals (e.g., 'I' and 'here'), 'now' always 'leaps out' of the scope of other operators. As Kaplan puts it:

> No operator can control the character of the indexical within its scope, because they will simply leap out of its scope to the front of the operator. I am not saying we could not construct a language with such operators, just that English is not one. And such operators could not be added to it. (1989: 510)

In the case of 'it will be that I am glad that I am writing now' the indexical 'now' takes 'primary scope' with respect to the prefix 'it will be that'; it 'leaps out of the scope to the front of the operator.' What Kaplan means by this metaphor is that even in embedded environments 'now' expresses the content it would express if it were not embedded. However deeply embedded it is, its semantic value is fixed by parameters of the context of use.

According to Kaplan, this feature of indexicals is not essential to indexicals; it is a contingent fact about indexicals in English. English does not contain any *context*-shifting operators, or 'monsters,' as Kaplan called them. Kaplan (1989: 510) characterizes monsters as follows:

> my liberality with respect to operators on content, i.e., intensional operators (any feature of the circumstances of evaluation that can be well defined and isolated) does not extend to operators which attempt to operate on character. Are there such operators as 'in some contexts it is true that', which when prefixed to a sentence yields a truth if and only if in some context the contained *sentence* (not the content expressed by it) expresses a content that is true in the circumstances of that context? Let us try it:
>
> (9) In some contexts it is true that I am not tired now.
>
> For (9) to be true in the present context it suffices that some agent of some context not be tired at the time of that context. (9), so interpreted has nothing to do with me or the present moment. (1989: 510)

Unlike a circumstance-shifting operator like 'it is possible that,' which shifts features of circumstance of evaluation, a context-shifting operator shifts parameters of the context of use. So in a language in which there are context-shifting operators which shift the speaker parameter, the content of 'I' need not be the speaker. If, for example, 'John believes that' were a context-shifting operator, 'John believes that I am hungry' could be interpreted as meaning that John believes that he is hungry.

As Philippe Schlenker (2003) points out, this is exactly what happens in Amharic, a Semitic language spoken in Ethiopia. In Amharic 'John believes that I am writing' can be interpreted as meaning that John believes that he is writing. So in Amharic 'John believes that' functions as a context-shifting operator.[16]

With one exception Kaplan thinks English does not function in this way. The exception is when indexicals occur in the scope of quotation marks.[17] As Kaplan puts it:

> There *is* a way to control an indexical, to keep it from taking primary scope, and even to refer it to another context (this amounts to changing its character). Use quotation marks. If we *mention* the indexical rather than *use* it, we can, of course, operate directly on it. Carnap once pointed out to me how important the difference between direct and indirect quotation is in
>
> Otto said 'I am a fool.'
>
> Otto said that I am a fool.
>
> Operators like 'In some contexts it is true that', which attempt to meddle with character, I call *monsters*. I claim that none can be expressed in English (without sneaking in a quotation device). If they stay in the metalanguage and confine their attention to sentences as in
>
> In some contexts 'I am not tired now' is true
>
> They are rendered harmless and can even do socially useful work. (1989: 510–11)

Quotation marks can prevent an indexical from 'leaping out to the front of the sentence.' So, while 'John says that I am writing' cannot be interpreted as meaning that John says that he is writing, 'John says, "I am writing"' can only be interpreted in that way.

With this one exception, indexicals 'leap out' of the scope of operators, and it is because they leap out of the scope of operators that 'now' is not superfluous. Since 'now' is not superfluous 'John is hungry now' and 'John is hungry' cannot be equivalent. In general, a sentence containing the word 'now' is not truth-conditionally equivalent to the sentence that results from dropping 'now.' But to admit that there are no such equivalences in English is to admit that the redundancy theory of the present tense is correct.

Of course, it may be objected that those who deny the redundancy of the present tense seem to be making a claim about the equivalence of these sentences when unembedded. The argument proposed only concerns the non-equivalence of these sentences when

[16] Schlenker thinks that Kaplan is wrong about English as well. Schlenker offers the following example 'John told me repeatedly over the years that he was sick two days ago.' 'Two days ago' can be interpreted with respect to the perspective of the earlier conversations. For a possible reply, see Recanati (2004).

[17] Strictly speaking, this is not an exception, since quotation marks are not usually treated as operators.

embedded, which is compatible with their equivalence when unembedded. By way of reply, it is reasonable to suppose that sentences undergo a reference-shift in belief contexts, but it is not reasonable to suppose without argument that sentences undergo a similar kind of shift in tensed environments.

Kaplan does not directly defend the redundancy of the present tense, but he goes as far as to say that the indexical treatment of present-tensed sentences might be philosophically unmotivated. Is there a good reason, Kaplan asks, to treat propositions as containing a time constituent and at the same time treat them as 'neutral with respect to possibility'? Kaplan:

> Philosophically, we may ask why the temporal indexical should be taken to be implicit (making the proposition eternal) when no modal indexical is taken to be implicit. After all, we *could* understand *S* as synonymous with *S′*: 'I am actually writing now'. The content of *S′* in *c* is not only eternal, it is perfect. Its truth changes neither though time nor possibility. Is there some good philosophical reason for preferring contents which are neutral with respect to possibility but draw fixed values from the context for all other features of a possible circumstance whether or not the sentence contains an explicit indexical? (1989: 503, note 28)

Kaplan's point is this: we could, if we wished, take modal sentences to contain implicit modal indexicals. According to the eternalist, for example,

> (14) John is a firefighter.

expresses, in a context *c*, the eternal proposition that John is a firefighter at t^*, where t^* is the time of *c*. The truth-value of this proposition is constant across time but not constant across possible worlds. Even if it is true in this world that John is a firefighter at, say, 3 p.m. April 5, 2006 CST, there are other possible worlds where it is false. The truth-value of the proposition expressed by (13), in a context *c*, is thus constant across time but variable across worlds.[18]

We could, however, take (13) to contain a modal indexical. Then (13) would express, in a context *c*, the proposition that John is a firefighter at the time and world of *c*. The truth of the proposition expressed by (13) would then be absolute; it would be constant across time and worlds. But this is not how (13) is ordinarily treated. But, Kaplan argues, without 'some good philosophical reason' to think that the truth-value of propositions varies across worlds but not across times, this position is ad hoc.

[18] Jonathan Schaffer (2011) argues against the asymmetry between tense and modality. Either both tense and modality should be treated as operators, or both should be treated as quantifiers.

6.5. AN ARGUMENT AGAINST A QUANTIFIER ANALYSIS OF THE TENSES

The argument just presented can be blocked either by distinguishing between compositional and non-compositional content in the way suggested by Stalnaker (1970), Lewis (1980), Salmon (1986, 1989), and others; by taking tense operators to operate on linguistic meaning, as suggested by Richard (1982); or by rejecting the assumption that there are tense operators in English.[19] I have already offered reasons to think that the double-content strategy fails. Richard's account collapses, as we have seen, into the double content strategy. That leaves us with the quantificational theories of past- and future-tensed sentences.

On the quantificational treatment of the tenses, the past and the future tenses and temporal prefixes, such as 'it was the case that' and 'it will be the case that,' are, loosely speaking, indexical, but not in the same way as the present tense. Past-tensed sentences contain an implicit time restriction: The times quantified over must be earlier than the time of speech. Likewise, the times quantified over in future-tensed sentences must be later than the time of speech. Consider, for instance:

(14) John was a firefighter.

The quantificational account assigns the following logical form to (14):

(14a) $\exists t(t < t^* \ \&$ John is a firefighter at $t)$

where t^* is the time of speech. Since (14) makes implicit reference to the time of speech, it will express different propositions relative to different contexts of use. The same holds for future-tensed sentences, and sentences containing temporal prefixes such as 'it was the case that' and 'it will be the case that.'

[19] As the argument rests on the assumption that 'I am happy' expresses a variable content when it occurs within the scope of a tense operator, the argument can be blocked by insisting that sentences like 'I am happy now' and 'I am happy' are equivalent when unembedded but not equivalent when embedded. A different way to block it would be to deny that pairs of sentences like 'I am busy' and 'I am busy now' are equivalent. According to Fitch, for example, 'I am busy' and 'I am busy now' mean the same thing in some contexts, 'but in other context they appear to mean very different things—I am busy in general or today versus I am busy at this very moment' (1999: 156). One problem with this reply is that it is unable to give an adequate account of dispute. Suppose I say 'I am busy,' and you say 'no, you are not' in dispute of my claim. If I asserted that I am busy (at every time) today and you deny what I asserted, then what you are saying is true iff there is some time today at which I am not busy. But these are not the correct truth-conditions for 'you are not busy.' I dealt with this objection in Chapter 3.

I provided some arguments against the quantificational analysis of the tenses and temporal prefixes. However, there are good reasons to reject a quantificational analysis of the tenses and temporal prefixes besides those presented in Chapter 4. Recall that Kaplan (1989) said that context-shifting operators could not be added to English. This is not so for other operators. So let us introduce a new operator 'in C.' Let C be the following sequence of parameters: the actual world, me, you, St. Louis, 3 p.m. CST, April 5, 2030. Consider my current assertion of:

(15) In C, it has been that I am writing.

Because the temporal prefix 'it has been that' in (15) is embedded, it is interpreted with respect to a future reference point, not my current one. That is, (15) is naturally taken to mean that I am writing at a time prior to the time of C. However, if 'it has been that' were an indexical, it would leap out of the scope of 'in C' (Kaplan 1989: 510). Consider, for instance, my current assertion of:

(16) In C, it has been that I am writing now.

Here 'now' refers to the current time in spite of the fact that it occurs within the scope of the operator 'in C.' Hence, if 'it has been that' were indexical, we should expect (15) to make implicit reference to the time of speech. The operand sentence 'it has been that I am writing' is analyzed as '$\exists t(t < t^* \ \&$ I am writing at $t)$,' where t^* is the time of speech. So (15) is analyzed as 'In C, $\exists t(t < t^* \ \&$ I am writing at $t)$.' But this says that in C, I am writing at a time t such that t is earlier than t^*, which is not a possible reading of (15). The only possible reading of (15) is one according to which I am writing at a time prior to 2030; and this time need not be prior to 2006.

Precisely the same point can be made with respect to future-tensed sentences. Where C′ is the following sequence of parameters: the actual world, me, you, St. Louis, 3 p.m. CST, April 5, 2002, consider:

(17) In C′, it will be the case that I am writing.

On the quantifier treatment of the future tense, (17) is analyzed as 'in C′, $\exists t(t^* < t \ \&$ I am writing at $t)$,' which says that in C′ I am writing prior to the time of speech. But this is not a possible reading of (17), which can only mean that I am writing at a time that is future relative to C′.

As expected, we get the same unwelcome result if the quantifiers range over events instead of times. With the quantifiers ranging over events, (15), namely, 'in C, it has been that I am writing,' cashes out to 'in C, $\exists e(e < u \ \&$ my writing $(e))$,' which says: in

C, there is a writing event involving me that is past relative to this very utterance. But the only possible reading of (15) would be one according to which I am writing at a time prior to 2030. In contrast, (17), namely 'In C′, it will be the case that I am writing,' upon analysis, cashes out to 'in C′, $\exists e(u < e$ & my writing $(e))$,' which says that in C′, there is a writing event involving me that is future relative to this very utterance. But this may be true in virtue of my writing tomorrow. Not so for (17).

It may be replied that the tenses are not to be treated as indexical in a narrow sense. On the view in question, the tenses do indeed make reference to the time of speech but one could say that this is rather like assigning the time of speech to a free variable, which can also get bound or assigned other times.

However, it is not entirely clear how this reply avoids the objection. For notice that it won't help to analyze (15) as 'in C, $\exists t(t < t'$ & I am writing at $t)$,' where t' is the time of C. For relative to my current context, the unembedded sentence 'it has been that I am writing' is analyzed as '$\exists t(t < t^*$ & I am writing at $t)$.' So if 'it has been that I am writing' is analyzed as '$\exists t(t < t'$ & I am writing at $t)$' when it occurs within the scope of 'in C′, then 'in C' functions as a context-shifting operator, or "monster": Pre-fixing it to the embedded sentence in (15) changes the semantic value of the indexical variable that is said to be implicit in the embedded sentence. If Kaplan is right, however, then there are no monsters in English, and 'such operators could not be added to it' (1989: 510). So it would seem that the implicit variable does not pick up the time of C.

To avoid the objection, it seems, one would need to reject the assumption that the tenses are object-language quantifiers. 'In C' would bind a free variable introduced by the past tense. But the tenses would then be variables, not object-language quantifiers; they would be more like pronouns and less like quantifiers. In Chapter 5 I offered reasons for thinking the tenses cannot simply *be* pronouns.

One might also worry that the introduction of operators like 'in C' assumes that there are times in the circumstances of evaluation. I do not think this is a genuine worry. 'In C' is not a magical device that can introduce times into the circumstances of evaluation if they are not already there, or change the meaning of the English tenses and temporal prefixes. In other words, the mere introduction of 'in C' into English shouldn't be able to affect the interpretation of the English tenses and temporal prefixes (note that it does not affect the interpretation of 'now'). The fact that 'in C' does affect the interpretation of the English tenses and temporal prefixes suggests that the tenses and temporal prefixes are not object-language quantifiers.

Of course, the argument presented here is only as strong as the intuitions on which it is founded. Some might deny that they have intuitions about the truth-value of sentences containing mock operators like 'in C.' If, however, sentences like (15) and (17) are best read in the way suggested, then this presents a serious difficulty for broadly indexical theories of past- and future-tensed sentences.

6.6. SIGNPOST

Kaplan's argument for temporal propositions runs as follows: If there are tense-operators in the language, then they operate on temporal propositions. So since there are tense-operators in the language, there are temporal propositions. The argument is not strictly sound, because the condition that there must be intensional operators that operate on contents in order for the contents to count as proposition is but one of many conditions on propositions. But if there are tense operators in English, then Kaplan's argument does establish this one condition on propositions.

However, most eternalists agree that there are tense operators in English and yet deny that the temporal contents they operate on are propositions. They agree that tense-operators operate on temporal content but deny that this content is a proposition, because it is not what is asserted by our utterances. They thus distinguish between the compositional semantic value of a sentence and the sentence's assertoric content.

The reasons I gave in the first three chapters for thinking that temporal contents are propositions counts against the view that the temporal semantic values of sentences are not propositions. Here I have offered independent evidence for thinking that none of the double-content strategies is greatly successful. The two views that hold up against the independent evidence are Stanley's view and King's view. Stanley, however, is committed to a rejection of the rigidity thesis:

> If *t* is rigid, and *t′* is non-rigid, for any two sentences *S* and *S′* which differ only in that *t* occurs in the former where *t′* occurs in the latter, any utterance of *S* and any utterance of *S′* have different assertoric content.

As we saw, rejecting this thesis makes trouble for Kripke's modal argument as an argument for the conclusion that names and descriptions have different assertoric content. Even if this consequence is acceptable, Stanley's position is still subject to the general criticism of eternalism provided in Chapters 2 and 3.

King's theory that there are no tense operators in English naturally rejects the conclusion that tense operators operate on temporal contents. Like Stanley's position King's view is subject to the general criticism of eternalism provided in Chapters 2 and 3. At the end of the chapter I presented an argument against King's treatment of the tenses that does not depend on the material presented in Chapters 2 and 3.

7

REPRESENTING ETERNALLY

In the previous chapters I have provided reasons for thinking that temporal contents can be the semantic values of truth-evaluable sentences, the objects of propositional attitudes, the objects of agreement and disagreement, the content that is passed on in successful communication, and the contents that intensional operators operate on. So temporal contents satisfy the conditions for being propositions. This establishes the truth of temporalism, which merely claims that *some* propositions are temporal.

In this chapter I will be concerned with the question of which eternal truths English speakers are committed to. I will argue that some English sentences express eternal propositions, whereas others can express either an eternal or a temporal proposition. At the end of the chapter, I will provide an argument for why metaphysical eternalists should adopt my ambiguity thesis rather than the quantificational account of tenses that they usually assume.

7.1. TWO KINDS OF CONTENT

In previous chapters I argued that there is good reason to think that temporal propositions can play the roles that eternal propositions have traditionally been thought to play. If temporal propositions can play these roles, then there is no need to distinguish between the objects of possible belief, assertion, agreement and disagreement, and the compositional semantic values of sentences in the way suggested by Robert Stalnaker (1970), David Lewis (1980), Nathan Salmon (1986, 1989), Michael Dummett (1991), Jason Stanley (1997a, b) and others. There is no need to distinguish between, say, the content of my belief that John is a firefighter and the content of the operand sentence in 'it has been that John is a firefighter.'

However, a question remains. If temporal propositions can play the roles that eternal propositions have traditionally been thought to play, where does that leave eternal propositions? It seems that I could say things like 'John is writing at 3 p.m. on April 5, 2006 (CST),' even if it is not very natural-sounding. Recall Zimmerman's (2006) example, 'I am giving a talk in Alaska at 1:45 p.m. on July 5, 2006' said in response to your question about my future endeavors. Surely, the contents of such sentences do not determine non-constant functions from <world, time> pairs to truth-values. For these contents

have their truth-values eternally: their truth-values do not change over time. If, however, there are eternal propositions, aren't there then two kinds of content after all?

I believe that there are two kinds of content, but not for the reasons that Stalnaker (1970), Lewis (1980), Dummett (1991), Salmon (1986, 1989, 2003) and Stanley (1997a, b) believed it. In ordinary speech, we do not ordinarily say things like 'John is writing at 3 p.m. on April 5, 2006 (CST).'[1] Instead, we would say 'John *was* writing at 3 p.m. on April 5, 2006 (CST).' As I argued in Chapter 2, the basic tenses may combine with time adverbials such as 'at 3 p.m. on April 5, 2006 (CST)' to form composite tense operators. 'John was writing at 3 p.m. on April 5, 2006 (CST),' for example, may be analyzed as 'it was the case at 3 p.m. on April 5, 2006 (CST) that John is writing.' The time adverbial completes the tense operator rather than the content of the operand sentence.

Still, I believe that there is good reason to distinguish between propositional content that determines a function from worlds to truth-values, and propositional content that determines a function from worlds and times to truth-values. We have already seen why we need the second kind of content. But the first kind is needed as well. It is needed to account for the content of present-tensed sentences with time adverbials, such as 'I am in Boston at 3 p.m. August 20, 2006' or 'I am giving a talk in Alaska at 1:45 p.m. on July 5, 2006.' (To avoid begging any questions, let 'present-tensed' be a technical term that applies to sentences whose copula or main verb phrase is grammatically in a present-tensed form, as in 'is' or 'is writing').

Can we conclude, then, that the contents of present-tensed sentences without time adverbials determine a function from worlds and times to truth-values, whereas the contents of sentences with time adverbials determine a function from worlds to truth-values? This suggestion seems to have some degree of initial plausibility. The content of 'John is a firefighter' is naturally taken to determine a function from worlds and times to truth-values, and the content of 'John is a firefighter at 3 p.m. April 5, 2006 (CST)' is naturally taken to determine a function from worlds to truth-values.

Some cases are not as clear-cut, however. If I consult my calendar in order to answer questions about my future whereabouts, I might say:

(1) I am giving a talk in Boston in August.

What is the content of (1)? It might be thought that (1), relative to a context, expresses a temporal proposition, for example, the proposition that Brit is giving a talk in Boston in August, period. 'In August' would then fail to be a referring expression. But that is odd if 'on 3 p.m. August 6, 2006' is a referring expression.

[1] One might even hold that 'John is writing at 3 p.m. April 5, 2006 (CST)' is ungrammatical. Ludlow (1999) takes this position very seriously. 'I am giving a talk at 1:45 p.m. July 5, 2006' and 'I am in Boston at 3 p.m. August 28, 2006' would then need to be treated as kinds of idioms.

A better suggestion is to say that 'in August' is indexical (cf. Bennett and Partee 2004: 64). 'In August' then refers to different time *intervals* depending on the context of use. If 'in August' is indexical, then (1) expresses, relative to a context of use, an eternal proposition that is partially determined by linguistic and extra-linguistic context, for example, the proposition that Brit is giving a talk in Boston in August, 2006, standard European time.[2]

It seems, then, that the contents of present-tensed sentences without time adverbials determine a function from worlds and times to truth-values, whereas the contents of present-tensed sentences with time adverbials determine a function from worlds to truth-values.

Unfortunately, matters are not so simple. For, there are unusual uses of present-tensed sentences without explicit time determination that could not plausibly be taken to express temporal propositions. Suppose that John and Mary are talking about whether or not there are wholly past objects. John who thinks that there are wholly past objects says:

(2) Socrates exists.

On a charitable interpretation, John did not intend to assert a proposition that is true iff Socrates is on the list of objects whose temporal location overlaps the present moment. Rather, he intended to assert a proposition that is true iff Socrates is on the list of all existing objects (Sider 2006).[3] Sentence (2) is true, on this unrestricted reading, iff Socrates is in our widest quantificational domain. When interpreted unrestrictedly, metaphysical eternalists will assent to (2), and presentists will deny it. As Sider puts it,

> Most ordinary uses of quantifiers are restricted in various ways, and one common restriction is to presently existing objects. In uttering [2] the eternalist intends to suspend this restriction. Likewise, when presentists reject [2], they too suspend this restriction (they do not intend their rejection of [2] to be trivially correct). No matter how unrestricted quantifiers become, the presentist thinks, they never range over [wholly past objects]. (2006: 5)

On one reading of (2), then, the content of (2) does not determine a function from worlds and times to truth-values; instead, it determines a function from worlds to truth-values.

[2] Radical minimalists like Kent Bach (1994, 2005) would say that (1) does not express a proposition, but that the speaker intends to assert a proposition of the mentioned sort. I shall set aside this suggestion here.

[3] It might be doubted that the ontological commitments of the metaphysical eternalist are expressible in English. I deal with that objection below.

But (2) can also be used to assert a false proposition. On this reading, I argued, the content of (2) determines a function from worlds and times to truth-values. So on this reading, the content of (2) is currently false because Socrates died many, many years ago, but it was true back when he was still alive. Present-tensed sentences without time adverbials can thus express, on different occasions of use, two kinds of content: eternal and temporal.[4,5]

The question here arises whether we should take the eternal content expressed by (2) on some of its uses to contain a time constituent. I think we should not. If we utter (2), we are certainly not saying that Socrates exists simultaneously with us.

We might, of course, be saying that there is a time at which Socrates exists. But there is no good reason to think that there is an unarticulated constituent in the underlying structure of sentences like (2). It is certainly true that Socrates, if he exists, exists at some time. But it is equally true that Socrates, if he exists, exists at some location, moves at a certain speed, fails to be co-located with Plato, and so on. Yet it is highly unlikely that (2), even when uttered at a particular time, makes reference to a location, a speed, and numerous other features necessitated by Socrates' existence.

But without good reason to think that (2), when uttered at a particular time, makes reference to a time, we are better off saying that it doesn't make reference to a time, which is to say, (2) just expresses the minimal proposition that Socrates exists.

My suggestion that there are two kinds of content, eternal and temporal, thus differs from the suggestions made by Stalnaker (1970), Lewis (1980), Dummett (1991), Salmon (1986, 1989), and Stanley (1997a, b) in three respects.

First, on the Stalnaker/Lewis/Dummett/Salmon/Stanley accounts, the distinction drawn is between ingredient sense and assertoric content, but that is not the same as the distinction between eternal and temporal propositions; for the ingredient sense can be eternal (e.g. the ingredient sense of 'John is hungry now').

Second, on the Stalnaker/Lewis/Dummett/Salmon/Stanley accounts, tensed sentences without time adverbials, when uttered at a particular time, make reference to the time of speech; on my account, they do not.

[4] More precisely: one and the same structured content can determine (at least) two kinds of intensions: a set of worlds and a set of centered worlds (i.e., a set of worlds marked with a time).

[5] The position that there are two kinds of content has the implication that there are two kinds of quantifiers: temporal and eternal. Take, for instance, the sentence 'there are dinosaurs.' On one interpretation, the content of 'there are dinosaurs' determines a function from worlds to truth-values. On another, it determines a function from <world, time> pairs to truth-values. In both cases, 'there are dinosaurs' is true iff the extension of 'dinosaurs' is non-empty. But on the first interpretation, the extension of 'dinosaurs,' relative to an actual context *c*, is the set of dinosaurs in the actual world. On the second interpretation, the extension of 'dinosaurs,' relative to an actual context c, is the set of dinosaurs temporally located at the time of *c*.

Third, on the Stalnaker/Lewis/Dummett/Salmon/Stanley accounts, tensed sentences without time adverbials normally express eternal propositions. On my account, by contrast, most sentences lacking time adverbials express eternal propositions only in very unusual circumstances (e.g., in the philosophy room).

It might be countered that the thesis that all present-tensed sentences without time adverbials can express two kinds of content is too strong. For suppose that John was sitting two minutes ago but is now standing. If the content of 'John has a straight shape' could be read as saying that John has a straight shape, period, where the proposition *John has a straight shape* determines a function from worlds to truth-values, then 'John has a straight shape' is true. But John was sitting two minutes ago. So 'John does not have a straight shape' is also true. So John both has and does not have a straight shape. Contradiction.

The problem is familiar. Lewis (1986: 203–4) called it 'the problem of temporary intrinsics.' Lewis thinks that there are three ways around the problem.

First, one might hold that 'John has a straight shape' expresses a *true* proposition only if John now has a straight shape (presentism).[6]

Second, one might reject the assumption that 'John has a straight shape' makes no reference to a time even if uttered at a particular time. 'John has a straight shape' really means, say, 'John has a straight shape at 3 p.m. April 5, 2006 (CST).'[7]

Third, one might say that 'John has a straight shape' expresses the minimal proposition that John has a straight shape but insists that the minimal proposition that John has a straight shape is true iff John has a temporal part that has a straight shape. Lewis prefers the third option.

Lewis is primarily interested in the metaphysical problem of how objects that persist over time can both possess and not possess a given temporary intrinsic property. As Sally Haslanger (1986) and Andy Egan (2004) have argued, however, the metaphysical problem could be solved by simply taking properties (or if you prefer: the semantic values of predicates) to determine functions from <world, time> pairs to extensions.[8] 'John has a straight shape,' as uttered in context *c*, is true simpliciter iff the temporal proposition *John has a straight shape* is true at the world and time of *c*. And 'John does not have a straight shape' is true at a context *c* iff the temporal proposition *John does not have a straight shape* is true at the world and time of *c*. Since there is no time at which both propositions are true, no contradiction will arise.

[6] The objection also goes away if one accepts the view that (i) there is only one concrete time, (ii) the set of things that exist is constant across time, and (iii) only present things are concrete.

[7] Personally I find the claim that 'Socrates exists,' when read unrestrictedly, makes implicit reference to a time implausible. Certainly, 'Socrates exists' does not mean that Socrates exists at the time of speech. But if 'Socrates exists' does not make implicit reference to a time, then neither does 'John is straight,' on its unrestricted reading.

[8] However, see Lewis (2002) for a reply.

That the metaphysical problem of temporary intrinsics can be solved in this way does not undercut the point I was trying to make above. The point I was trying to make was simply that one *could* use (2) to mean the eternal proposition that Socrates exists. Likewise, I think that one *could* use 'John has a straight shape' to mean the eternal proposition that John has a straight shape. But such an eternal claim is truth-evaluable at a world *w* only if (i) John is an instantaneous object at *w*, (ii) John always has a straight shape at *w*, (iii) John never has a straight shape at *w*, or (iv) Lewis is right that the *eternal* proposition *John has a straight shape* is true at *w* iff John has a temporal part that has a straight shape.

Notice that when the contents of a present-tensed sentence without time adverbials (e.g., 'Socrates exists') determine a function from worlds to truth-values, any prefixed tense operator will be semantically vacuous. Speaking with the quantifiers wide open, 'it was the case that Socrates exists' is true, and so is 'it will be the case that Socrates exists.' In other words, if we assume that 'it was the case that' and 'it will be the case that' function as Priorian sentential operators and the operand sentence expresses an eternal proposition then, the operators will be redundant. This was the essence of Kaplan's argument for premise 3 in the argument outlined in Chapter 6. Here is Kaplan:

> [I]f *what is said* is thought of as incorporating reference to a specific time, or state of the world, or whatever, it is otiose to ask whether what is said would have been true at another time, in another state of the world, or whatever. Temporal operators applied to eternal sentences (those whose contents incorporate a specific time of evaluation) are redundant. Any intensional operators applied to *perfect* sentences (those whose contents incorporate specific values for all features of circumstances) are redundant. (1989: 502–3)

Tense operators shift the time parameter of the circumstance of evaluation even when they operate on eternal propositions. But since an eternal proposition cannot change its truth-value across time, shifting the time parameter of the circumstance will have no effect on the truth-value. Kaplan thinks that 'it makes no sense to have temporal operators' if they operate on eternal contents (e.g., 'John is a firefighter at 3 p.m. April 5, 2006 (CST)'). But that is just to say that our ordinary tense operators operate on content that determines a function from worlds and times to truth-values and not on content that determines a function from worlds to truth-values.

7.2. PAST- AND FUTURE-TENSED SENTENCES

I argued that present-tensed sentences without time adverbials can express, relative to a context of use, two different kinds of content: eternal and temporal. The same holds for past- and future-tensed sentences. Consider, for instance:

(3) John was a firefighter at 3 p.m. April 5, 2006 (CST)

On one reading, (3) means that it was the case at 3 p.m. April 5, 2006 (CST) that (John is a firefighter); on a second reading, it means that it was the case that (John is a firefighter at 3 p.m. April 5, 2006 (CST)). The first reading is the only natural reading. The reason is that on the second reading, the past-tense operator 'it was the case that' is semantically redundant: 'it was the case that' maps the eternal proposition *John is a firefighter at 3 p.m. April 5, 2006 (CST)* to the true iff *John is a firefighter at 3 p.m. April 5, 2006 (CST)* is true at a past time. If the eternal proposition *John is a firefighter at 3 p.m. April 5, 2006 (CST)* is true, it is always true; hence, it was and will be true. On this reading, then, (3) is true when uttered by a speaker in 49 BC (if true at all). But this, of course, is not how we would normally read (3).

Sentences with span operators exhibit a similar ambiguity. Consider, for instance:

(4) John was a firefighter from 1980 to 1990.

On one reading, (4) is of the form 'it WAS the case from 1980 to 1990 that (John is a firefighter).' 'It WAS the case from 1980 to 1990' maps the temporal proposition *John is a firefighter* to the true iff *John is a firefighter* is true throughout a past time span that endures from 1980 to 1990.

On the second reading, (4) is of the form 'It WAS the case that (John is a firefighter from 1980 to 1990).' In this case, 'It WAS the case that' maps the eternal proposition *John is a firefighter from 1980 to 1990* to the true iff *John is a firefighter from 1980 to 1990* is true at a past time span. Since the eternal proposition *John is a firefighter from 1980 to 1990* is eternally true or eternally false, the past tense operator is redundant. So just as 'it is always the case that Socrates exists' and 'it will be that Socrates exists' are true if 'Socrates exists' is given an unrestricted reading, so (4), if true at all, would be true if it were uttered in 1970. But this, of course, is not how we would normally read (4).

It might be countered that even if (3) and (4) technically have two readings, one of these readings is unnatural. For that reason, it might be better to say that (3) and (4) have just one reading. I disagree. For many metaphysical eternalists are quite happy to attribute truth to sentences like 'it is always the case that Socrates exists' (e.g., Sider 2001: chap. 1). But the sentence 'it is always the case that Socrates exists' entails that Socrates existed, exists, and will exist. So metaphysical eternalists are committed to the truth of 'Socrates will exist.'

The same holds for:

(5)

(a) Hitler will invade Poland in 1939.

(b) There were people living on the moon in year 15846.

(c) Caesar is currently eating breakfast on January 15, 49 BC.

Metaphysical eternalists are committed to the truth of 'Hitler is invading Poland in 1939,' 'there are people living on the moon in year 15846,' and 'Caesar is eating breakfast on January 15, 49 BC.' As the latter sentences are true regardless of when they are uttered, they entail the tensed forms given in (5). Metaphysical eternalists are thus committed to the truth of 'it will be the case that (Hitler invades Poland in 1939),' 'it was the case that (there are people living on the moon in year 15846),' and 'it is now the case that (Caesar is eating breakfast on January 15, 49 BC).' So unless there is reason to think that metaphysical eternalists don't speak English, or that their ontological commitments are inexpressible in English, it can hardly be denied that the ambiguity in question is real.

One might, of course, insist that the ontological commitments of the metaphysical eternalist are inexpressible in English. When philosophers say things like 'Socrates exists,' they might be taken to speak a regimented language that, in spite of being superficially similar to English, allows for additional readings of tensed sentences.

However, there are several good reasons to think unrestricted propositions like *Socrates exists* are expressible in English. First, those who take the tenses to be object-language quantifiers should not be making this objection. For they already hold that ordinary speakers quantify over objects that do not presently exist. Take, for instance, 'Socrates was a philosopher.' If the past tense is a quantifier, then the sentence, upon analysis, cashes out to '$\exists x \exists t(t < t^* \ \& \ \mathrm{P}x\ (t))$.' So an ordinary speaker who asserts 'Socrates was a philosopher' is in effect asserting an unrestricted proposition. But if a speaker would be speaking English were she to assert the unrestricted content of 'Socrates was a philosopher,' surely she would also be speaking English were she to assert the unrestricted content of 'Socrates exists.'

Second, whether or not there happens to be a way of expressing unrestricted propositions in English, or any other natural language, we are clearly capable of interpreting the relevant sentences. But presumably we wouldn't be capable of doing this if unrestricted propositions were inexpressible in natural language. For, as Ludlow points out, '[the] interpretation must (ultimately) take place in a language we understand—i.e., a natural language' (2004: 25).[9]

Third, if I were to utter 'Socrates exists,' I would in most circumstances be interpreted as having said something that is true iff Socrates exists, located simultaneously with us. But a restricted reading would not be the most charitable reading if I were to utter any of the following sentences:

(6)

(a) Who is Socrates?

[9] Ludlow (2004) is a reply to Crisp (2004).

(b) Socrates is a philosopher.
(c) What's the name of Abraham Lincoln's dog?
(d) If you go back in time and kill your grandfather, you cease to exist.
(e) The past is real.
(f) There are wholly past objects.
(g) Every past event is past.
(h) There is a first mover.
(i) Objects persist over time.
(j) Objects are spread out in space and time.
(k) The universe is four-dimensional.
(l) The universe keeps expanding and contracting.

In fact, even non-philosophers will occasionally utter such sentences. If, however, these sentences do not have unrestricted readings in English, then we are forced to conclude that non-philosophers occasionally do not speak English, or alternatively, that they mistakenly think that they are saying something that *could* be true when in fact it is obviously false (e.g., 'the universe keeps expanding and contracting').[10]

In general, then, it seems that present-tensed sentences without time adverbials and past- and future-tensed sentences with or without time adverbials admit of two readings: an eternal and a temporal reading. For example, 'John was a firefighter at 3 p.m. April 5, 2006 (CST)' is naturally interpreted as meaning 'it was the case at 3 p.m. April 5, 2006 (CST) that (John is a firefighter).' The latter is a temporal proposition: it is false when uttered before 3 p.m. April 5, 2006 (CST), and possibly true afterwards. But it also has a less natural reading where the past tense is redundant, namely 'it was the case that (John is a firefighter at 3 p.m. April 5, 2006 (CST)).' If *John is a firefighter at 3 p.m. April 5, 2006 (CST)* is true at all, it is always true; so it was true and will be true.

The only kinds of sentences that are not ambiguous in this way, it seems, are present-tensed sentences with explicit time determination. For example, 'John is a firefighter at 3 p.m. April 5, 2006 (CST)' can only be read as expressing an eternal proposition.

7.3. CONJOINED PROPOSITIONS

The view that some sentences express temporal propositions while others express eternal propositions (depending on how they are disambiguated) raises the question how to deal with conjoined propositions.[11] Suppose that *p* is a sentence that expresses

[10] If the critics were right, then these sentences would be equivalent to 'there are wholly past objects, located simultaneously with us,' 'the past exists, located simultaneously with us,' and 'Socrates is located simultaneously with us and is a philosopher,' and so on.

[11] Thanks to an anonymous reviewer here.

a temporal proposition while *q* expresses an eternal one. What sort of proposition is expressed if these two sentences are conjoined, that is, which sort of proposition is expressed by '*p* and *q*'?

At first glance, it may be thought that one could run a version of the Frege-Geach problem against the position I have proposed. The Frege-Geach problem, in its standard version, is the problem of accounting for how sentences that express truth-evaluable propositions interact with sentences that appear to express truth-evaluable propositions but in fact do not. For example, if an expressivist takes 'lying is wrong' to mean 'boo! to lying,' then the problem arises of how to account for apparently valid inferences such as:

(A)
Lying is wrong.
John was lying.
Therefore, John did something wrong.

(B)
If lying is wrong, then Mary said something false.
Lying is wrong.
So Mary said something false.

The problem for the expressivist is that 'boo! to lying' isn't truth-evaluable. If I sincerely utter that sentence, I am merely expressing an attitude towards lying. So it makes no sense for you to say 'that's false.' So the apparently valid arguments in (A) and (B) cannot be evaluated for validity.

However, there is no similar problem for the view defended here. Conjoined eternal and temporal propositions are simply temporal propositions. Take, for instance, 'John is a firefighter, and I am giving a talk in Alaska at 1:45 p.m. on July 5, 2040.' While this is not a very natural sentence to utter in English, it is clear that the sentence expresses a temporal proposition. The sentence could express a proposition that is true today but false tomorrow after John gets fired.

There is no problem with the other connectors either. The conditional 'if John is a firefighter, then I am giving a talk in Alaska at 1:45 p.m. on July 5, 2040,' for example, expresses a temporal proposition that happens to be eternally true if I am giving a talk in Alaska at 1:45 p.m. on July 5, 2040. If I am giving a talk then, then the consequent of the conditional is true. So in the envisaged circumstances, the conditional cannot be false. However, the conditional is still a temporal proposition in the sense that it may be true at one time but false at another. If I am not giving a talk in Alaska at 1:45 p.m. on July 5, 2040, then the proposition expressed will be false at times at which John is a firefighter and true at times at which John is not a firefighter.

We can also easily account for inferences involving both kinds of propositions. Consider:

(C)
If John is a firefighter, then I am giving a talk in Alaska at 1:45 p.m. on July 5, 2040.
John is a firefighter.
So I am giving a talk in Alaska at 1:45 p.m. on July 5, 2040.

We can account for the validity of the inference in the standard way. Eternal propositions have the same truth-value regardless of whether they are evaluated for truth at a world or at a centered world in which a time is marked. So there is no pair of a world and time at which the two first premises are true and the conclusion false.

What was just said about sentences with explicit references to times carries over to other sentences that express eternal propositions. Consider the following inference:

(D)
If Socrates exists, then presentism is false.
Socrates exists.
So presentism is false.

If 'Socrates exists' expresses a temporal proposition, then the second premise is false when the speaker occupies the same time segment of the world as Socrates. If 'Socrates exists' expresses an eternal proposition, then the second premise is true regardless of which time segment of the world the speaker occupies. Either way, there is no circumstance of evaluation at which the premises are true and the conclusion false. So we can easily account for the validity of the argument.

7.4. TWO KINDS OF PROPOSITIONS

At this point the question arises: If there are two kinds of possible contents that most sentences can have, which of these *really* deserves the name 'proposition'? The overwhelmingly natural answer is, of course, that both do. Both kinds of content can play the roles that propositions have traditionally been thought to play.

First, both kinds of content can serve as the semantic values of sentences. Temporal propositions are the objects on which tense operators operate *and* the (natural) contents of present-tensed sentences without time adverbials such as 'John is a firefighter.' Temporal propositions also serve as the contents of past- and future-tensed sentences. Eternal propositions are the contents of present-tensed sentences with explicit time

determination such as 'I am giving a talk at 1:45 in Alaska on July 5, 2006,' and the contents of present-tensed sentences, such as 'there are wholly past objects,' when these are given an unrestricted reading. They are also the contents of past- and future-tensed sentences, such as 'Socrates will exist' when the tenses are read as semantically redundant.

Second, both kinds of content are objects of possible belief. I may well believe the content of the present-tensed sentence 'John is firefighter' today but not tomorrow when I am told that John has been fired. Likewise, I may well believe that there are non-present objects. But the content of my belief that there are non-present objects is not a function of times; it cannot be true today but false tomorrow. So both kinds of content are candidates for being objects of possible belief.

Third, both kinds of content are the kinds of content that intensional operators can operate on. Tense operators can operate on both kinds of content but they are semantically redundant when they operate on eternal content. Modal operators, too, can operate on both kinds of content, and they are not semantically redundant in either case. For example, even though 'it is possible that John is a firefighter at 3 p.m. April 5, 2006' is true, the operand sentence 'John is a firefighter at 3 p.m. April 5, 2006' may be actually false. Likewise, even though 'it is possible that John is a firefighter' is true, because the operant sentence is true at some centered world, the operand sentence 'John is a firefighter' may be false at the time of speech.

Fourth, both kinds of contents can be the objects transferred or shared when people communicate successfully. Ordinarily when A says to B: 'John is tall,' the proposition that is transferred from A to B, if communication is successful, is the temporal proposition that John is tall, not the proposition that John is tall at t^*. But if the conversation takes place in the philosophy room, and A, who is a metaphysical eternalist, says 'Socrates exists,' what is transferred, if communication is successful, may well be the eternal proposition that Socrates exists.

Fifth, both kinds of contents can be the objects of agreement and disagreement. If A says at t_1 'John is a firefighter' and B says at t_2 'You are wrong. He is not a firefighter,' B is denying that the temporal proposition that John is a firefighter is true. These kinds of contradictions constitute a genuine disagreement when the speakers are prepared to assign different truth-values to the same temporal proposition at any time during the disagreement. If, on the other hand, A says, 'The universe keeps expanding and contracting,' and B says, 'You are wrong. The universe doesn't keep expanding and contracting. It just keeps expanding,' B is denying a proposition A asserts, namely the eternal proposition that the universe keeps expanding and contradicting.

It is sometimes thought that temporal propositions cannot serve as the objects of disagreement (see e.g., Recanati 2007). If I say 'John is hungry' before dinner and John is not hungry after dinner, it would be odd for me to add 'so I was wrong.' However, as

I argued in Chapter 3, there is no problem here. I shouldn't say 'I was wrong' unless I have good reason to believe that I was wrong back then. In the envisaged circumstances I have no good reason to believe I was wrong; hence, 'I was wrong' is unassertable in the envisaged circumstances.

Disagreement can indeed be about temporally neutral contents. If A says 'John is hungry' and B says 'No, you are wrong. John is not hungry,' then B is evaluating the proposition that John is hungry with respect to the time at which her utterance takes place. B takes the proposition that John is hungry, which A expressed at an earlier time, to be false with respect to the time B is at. Of course, A may no longer be inclined to regard the proposition that John is hungry as true. But to the extent that A is so inclined, A and B are in disagreement: They are in disagreement about which truth-value to assign to the proposition that John is hungry at the time at which B is located.

To recap: Both temporal and eternal contents can play the roles that propositions have traditionally been thought to play. They can be the semantic values of truth-evaluable sentences, the object of propositional attitudes, the objects of agreement and disagreement, the contents that are passed on in successful communication, and the contents that intensional operators operate on.

In the next section I will provide an argument for why metaphysical eternalist should hypothesize that sentences without explicit time determination, such as 'Socrates exists,' can be read in two different ways, rather than assuming that they can say what they want to say using a quantificational account of tenses.

7.5. ETERNAL PROPOSITIONS AND METAPHYSICAL ETERNALISM

According to the quantifier treatment of the tenses, the tenses function semantically as object-language quantifiers. Consider, for instance:

(7) John is a firefighter.
(8) John was a firefighter.
(9) John will be a firefighter.

On the quantifier analysis, the propositions expressed, relative to a context of use, by (7)-(9) can be represented as follows:

(7a) John is a firefighter at t^*
(8a) $\exists t(t < t^*$ & John is a firefighter at $t)$
(9a) $\exists t(t^* < t$ & John is a firefighter at $t)$

Sentence (7a) says that at the time of speech John is a firefighter. In (8a) and (9a) the existential quantifier quantifies over the variable *t*. While (8a) says that there is a time *t* such that *t* is earlier than the time of speech, and John is a firefighter at *t*, (9a) says that there is a time *t* such that the time of speech is earlier than *t*, and John is a firefighter at *t*.

But let us now consider example (2), repeated from above:

(2) Socrates exists.

Presentists deny that there are wholly past and wholly future objects. So they will deny that (2) is currently true. But philosophers who believe that there are wholly past objects will assent to the truth of (2). On a quantifier treatment of the tenses, however, we should expect (2) to express the following proposition:

(2a) Socrates exists at t^*

where t^* is the time of speech. (2a) says that at the time of speech Socrates exists. This may not sound too counterintuitive. After all, if there are wholly past objects, and Socrates is among them, then Socrates exists. Furthermore, if Socrates exists as such, then it would seem to follow that he exists at the time of speech.

The problem for the defender of the quantifier treatment of the tenses is that (2a) can also be interpreted as meaning that Socrates occupies the same time slice of the universe as the speaker. This is the reading we would ordinarily express with 'Socrates exists now,' as the following exchange illustrates:

VISITING SOCRATES
(You are calling me on my cell phone.)
YOU: What are you doing?
ME: I am visiting Socrates.
YOU: What do you mean? Socrates doesn't exist.
ME: Of course he does. Are you some kind of presentist, or something?
YOU: Of course not. What I meant was: Socrates doesn't exist now. So you couldn't possibly be visiting him.

On the quantifier analysis, the content of 'Socrates doesn't exist now' can be represented as 'it is not the case that Socrates exists at t^*.' But by 'Socrates doesn't exist' you clearly do not mean to say that it is false at the time of speech that Socrates exists (unrestrictedly). That is, you are not denying,

(2a) Socrates exists at t^*,

when (2a) is assigned an unrestricted reading. Thus (2a) can be read in two different ways. But surely, any minimally adequate analysis of (2) must be unambiguous. So if (2a) can be read in two different ways, then it cannot serve as an analysis of (2). This is a problem for the quantifier analysis of the tenses, as it holds that (2), upon analysis, cashes out to (2a).

There is a simple reply to this argument. Take (2a) to represent the proposition expressed by (2) when the truth of (2) entails that Socrates is temporally located simultaneously with us. The proposition expressed by (2) when the truth of (2) does not entail that Socrates is temporally located simultaneously with us can then be represented as follows:

(2b) There was, is, or will be something that is identical to Socrates

Sentence (2b) can be analyzed in predicate logic with time variables. However, the strategy does not work. For on the unrestricted reading, '$\exists x(\phi x)$' does not entail '$P\exists x(\phi x)$ or $\exists x(\phi x)$ or $F\exists x(\phi x)$.' Sider (2001: 16) gives us the following counterexample. Take x to be a set containing a computer and a dinosaur. 'There is a set containing a computer and a dinosaur' does not entail 'there was a set containing a computer and a dinosaur, or there is a set containing a computer and a dinosaur, or there will be a set containing a computer and a dinosaur.' Sider explains:

> The first disjunct . . . says (informally) that at some time in the past there existed a set containing a dinosaur and a computer; the second says that there exists such a set at the present time, and the final disjunct says that at some future time, some such set exists. Since at no one time did there exist *both* a dinosaur and a computer, it follows that at no time will there exist a set containing a dinosaur and a computer (assuming that a set exists only if its members do). (2001: 16)

Since sets are extensionally defined, they exist only if their members do. So there is no one time at which there existed a set with a computer and a dinosaur as members. So disjunctivism is not the answer to the quantificationalist's troubles.

Here is another reply. Let us take (2a) to represent the proposition expressed by (2) when the truth of (2) entails that Socrates is temporally located simultaneously with us. The proposition expressed by (2) when the truth of (2) does not entail that Socrates is temporally located simultaneously with us can then be represented as follows:

(2c) There is something that is identical to Socrates.

The idea is that when (2) is intended to express the claim that Socrates exists simpliciter, the proposition expressed does not contain a time constituent.

This suggestion will not do, however. For one thing, if Socrates exists simpliciter, then he exists simpliciter at the time of speech. But the latter would seem to give us (2a). For another, 'Socrates exists simpliciter' entails that it is always the case that Socrates exists simpliciter. But the latter entails that it was, is, and will be the case that Socrates exists simpliciter, which in turn entails that it will be the case that Socrates exists simpliciter. But it is altogether unclear how the quantifier treatment would be able to offer an analysis of 'it will be the case that Socrates exists simpliciter.' 'There is a future time *t* such that there is someone who is identical to Socrates at *t*' is ambiguous, and so 2(c) cannot serve as an analysis of this claim.

Notice that nothing turns on the fact that we picked an existence claim. For virtually the same problem arises with sentences like:

(10) Socrates is human

Non-presentists want to say that (10) has a true reading in spite of the fact that Socrates is not temporally located simultaneously with us (Sider 2006). However, even on this reading, (10) entails that Socrates is human at the time of speech. But the latter cannot be represented as:

(10a) Socrates is human at t^*

For (10a) is supposed to represent the content of (10) when (10) entails that Socrates is located simultaneously with us.

Moreover, if (10) is true when given an unrestricted reading, then it is always true. So if Socrates is human, then regardless of his temporal location, it is always the case that he is human. So it was, is and will be the case that he is human. Hence, the following sentences are true:

(11) It was the case that Socrates is human
(12) It will be the case that Socrates is human

On the quantifier analysis, the propositions expressed by (11) and (12) are represented as follows:

(11a) $\exists t(t < t^* \,\&$ Socrates is human at $t)$
(12a) $\exists t(t^* < t \,\&$ Socrates is human at $t)$

But these are the propositions expressed by (11) and (12) when the latter are given their ordinary tensed readings. So since (11a) and (12a) are ambiguous, they do not constitute adequate analyses of (11) and (12).

The solution to the problems is, of course, to take the temporal prefixes in (11) and (12), when (11) and (12) are given an unrestricted reading, to be operators on eternal content. Tense operators on eternal content are semantically redundant. That being so, (11) and (12) incur the same ontological commitments as (2) when the latter is read unrestrictedly.

Unfortunately, this option is not open to the advocate of the quantifier analysis. The advocate of the quantifier analysis holds that there are *no* tense operators in English. But it is arguable that even the language spoken in the philosophy room is English. So if the advocate of the quantifier analysis were to avail herself of this strategy, she would be required to give up her core claim and, worse, posit a systematic ambiguity in the English tenses.

Everything that has just been said carries over to other quantificational accounts of the tenses. Sider (2006), for example, takes the past tense in

(13) Socrates once existed

to make implicit reference to a past temporal location. Sider offers the following paraphrase:

(14) Socrates exists, located temporally before us.

Sider's strategy is to take the past tense to make implicit reference to past location, the present tense to make implicit reference to a present location, and the future tense to make implicit reference to a future location. But this translation method has its limitations. Formally, we might represent (14) as:

(14a) $\exists t \exists x(t < t_u \ \& \ x = \text{Socrates}\ (t))$

where t_u is the time of speech. But Sider (2001: 165f) insists that identity isn't temporary. So if there is something that is identical to Socrates at t, then there is something that is identical to Socrates. So as far as the metaphysical eternalist is concerned, there is something that is identical to Socrates. But we cannot analyze the latter as 'Socrates existed, exists or will exist' or as 'Socrates exists, located temporally simultaneously with us' (Sider 2001: 15–16).

Likewise, if 'Socrates exists, located temporally before us' is true, then so is

(15) It will be the case tomorrow that Socrates exists, located temporally before us.

It is tempting to analyze the latter as 'there is a future time t and a past time t' such that at t Socrates exists at t' .' But this temptation should be resisted. As Sider (2001: 169) points out, double temporal quantification must be subject to the following restriction:

(at t_1: at t_2, ϕx) ↔ at t_2, ϕx

If we deny that identity is temporary, the outermost quantifier must be taken to be redundant (Sider 2001: 169). We have already seen that redundant sentential operators are harmless, because they function in exactly the same way as non-redundant sentential operators. For example, tense operators are redundant if they operate on eternal content, but they function in exactly the same way regardless of whether they are redundant or not: a tense operator shifts the time parameter of the circumstance of evaluation.

Unlike redundant tense operators, however, redundant quantifiers are highly suspect. As quantifiers are second-order predicates, the extension of 'some A is B' can be given as follows (Barwise and Cooper 1981):

Some A B iff A ∩ B ≠ o

So on the quantificational analysis of the tenses, 'Socrates exists at some future time' is true iff the intersection of the set of future times and the set of entities at which Socrates exists is non-empty. But it is altogether unclear how to provide an adequate analysis of redundant quantifiers along the same lines. So we cannot simply analyze (15) as 'there is a future time t and a past time t' such that at t Socrates exists at t' '.

One might attempt to spell out the difference between the two readings of (15) by appealing to the *true at*/*true in* distinction (see e.g., Fine 1977 and Mentzel 1993). The distinction is familiar from the literature on modality. 'It is possible that Socrates doesn't exist' is true at a context c iff there is a c-accessible world w such that the proposition that Socrates doesn't exist is true *at* (but not true *in*) w. Perhaps the metaphysical eternalist can insist that (15), upon analysis, cashes out to 'there is a future time t and a past time t' such that *at* t Socrates exists *in* t' '. I like the suggestion. But, as it stands, it is just a reformulation of the redundant quantifier strategy and as such it fails to remove the mystery from redundant quantifiers.

An alternative strategy for the metaphysical eternalist is to take the redundant tenses to be Priorian tense operators. As Priorian tense operators are semantically vacuous when the operand sentence is eternal, taking the temporal prefix in (15) to be a Priorian tense operator gives us the right result.

However, it is hardly the case that the English tenses and temporal prefixes function sometimes as quantifiers and sometimes as sentential operators. Hence, as some occurrences of the English tenses and temporal prefixes function as sentential operators, all occurrences function in that way, which is just to say that metaphysical eternalists ought to be temporalists.

7.6. SIGNPOST

I have argued that present-tensed sentences lacking time determination and past- and future-tensed sentences are capable of expressing two different kinds of content, relative to a context of use: eternal and temporal content. For example, on its most natural reading, 'there are wholly past objects' expresses a proposition that is possibly true, namely one that is true iff the extension of 'wholly past' relative to the world of speech is non-empty. On a less natural reading, it expresses an obviously false proposition, namely one that is true iff the extension relative to the time of speech of 'wholly past' is non-empty. When read in the first way, the proposition expressed determines a function from worlds to truth-values; when read in the second way, it determines a function from <world, time> pairs to truth-values.

A past-tensed sentence such as 'John was a firefighter at 3 p.m. April 5, 2006 (CST)' can likewise be read in two different ways. On one reading, the past tense operator *it was the case at 3 p.m. April 5, 2006 (CST) that* operates on the temporal proposition *John is a firefighter*. On another reading, the past tense operator *it was the case that* operates on the eternal proposition *John is a firefighter at 3 p.m. April 5, 2006 (CST)*. In the second case the past tense operator is semantically vacuous.

Both of these contents, I argued, satisfy the conditions for being propositions: They can both be the semantic values of truth-evaluable sentences, the objects of propositional attitudes, the objects of agreement and disagreement, what is passed on in successful communication, and the contents intensional operators operate on.

In the final section, I argued that a quantificational analysis of the tenses and temporal prefixes is unable to offer an adequate analysis of tensed sentences when the latter are given an unrestricted interpretation (as in 'it will always be the case that only present objects exist'). I take this to be a strong reason for metaphysical eternalists to reject semantic eternalism and adopt the alternative ambiguity thesis for tensed language.

8

REPRESENTING THE WORLD EGOCENTRICALLY

In *Relativism and Monadic Truth* (2009) Herman Cappelen and John Hawthorne set out to defend a monadic theory of truth which they say can be summarized by the following five theses:

(T1) There are propositions and they instantiate the fundamental monadic properties of truth simpliciter and falsity simpliciter.
(T2) The semantic values of declarative sentences relative to contexts of utterance are propositions.
(T3) Propositions are the objects of propositional attitudes, such as belief, hope, wish, doubt, etc.
(T4) Propositions are the objects of illocutionary acts; they are, for example, what we assert and deny.
(T5) Propositions are the objects of agreement and disagreement.

They call T1-T5 the 'simple view' or 'Simplicity' for short (I will use 'Simplicity' and 'the monadic truth package' synonymously). Cappelen and Hawthorne's book is meant to offer a general argument against assessment-sensitive relativism (relativism proper) and special versions of relativism, including non-indexical contextualism and temporalism. Their last chapter illustrates how their view applies to predicates of personal taste (for a relativistic treatment of predicates of personal taste, see e.g., Lasersohn 2009). The core of their argument is that most of the evidence in favor of relativism can be handled by a version of flexible contextualism that takes the candidate expressions to be associated with a hidden variable that can take on values other than the speaker. For example, 'this chili is tasty' has the underlying form 'this chili is tasty to *x*,' where the value of '*x*' can be the speaker, the hearer or a third party. In this chapter, I begin with a brief presentation of Cappelen and Hawthorne's arguments against non-indexical contextualism, temporalism and relativism. I then offer a general argument against the monadic truth package and their rejection of non-indexical contextualism. Finally, I offer a self-standing argument for temporalism.

8.1. CAPPELEN AND HAWTHORNE'S MAIN ARGUMENTS AGAINST RELATIVISM

Non-Indexical Contextualism

Non-indexical contextualism is the view that context-sensitive expressions have a content that remains stable across contexts of use but have extensions that vary with contexts of use (MacFarlane 2009). For example, if 'cold' is context-sensitive, then its semantic content *coldness* remains stable across contexts of use but its content *coldness* has an extension only relative to a speaker and a time. As a result, when Tim says 'the antechamber is cold,' his utterance, that is, the sentence relative to Tim's context of use, is true or false simpliciter but the proposition expressed by his utterance is true or false only relative to the speaker (here: Tim).

Cappelen and Hawthorne's section on non-indexical contextualism is short: just under four pages. They say that they will not provide a detailed discussion of the position because they think the view does not occupy 'an interesting position in logical space' (21). Setting aside issues of tense, the defender of monadic truth can adhere to the following principles:

> P1: If S expresses the content P at context C, then S is true at C iff the content P is true
> P2: An assertion/utterance with the content P is true iff the content P is true.

A non-indexical contextualist with respect to type-T content rejects that type-T content has a truth-value simpliciter; hence, she must reject P1 and P2. According to Cappelen and Hawthorne, this has unwelcome consequences. They offer the following example: 'Crispin walks into the antechamber of the baths from the outside and declares "the antechamber is not cold". Tim walks in from the hot baths and declares "the antechamber is cold" (18). According to Cappelen and Hawthorne, the non-indexicalist recommends that Tim says to Crispin:

> (A) Your utterance is true but the claim that you are making by your utterance is not true.
> (B) Your assertion is true but the proposition that you are expressing by your assertion is not true.
> (C) You know that your assertion is true and you know that your assertion is an assertion that it is not cold and that you are not half bad at deducing the obvious, but you are in no position to know that it is not cold.

Cappelen and Hawthorne conclude on this ground that non-indexical contextualism is not an 'interesting position.' The most important lesson I have learned during my

philosophical career is that on occasion we must bite a few intuition bullets if we want to have a taste of the true. Is this one of those occasions? Not according to Cappelen and Hawthorne. They say that they 'find it hard to see any significant avenues opened up by non-indexical contextualism' (24). Below I will argue that Cappelen and Hawthorne haven't looked hard enough, as non-indexical contextualism offers the best overall account of color discourse and tensed discourse. Hence, we must bite a few bullets. It should be noted, though, that if more careful attention is paid to what is expressed by (A)–(C), the bullets become better-tasting and easier to swallow. Arguably, (A)–(C) leave a bad taste in your mouth only because they encourage the reader to equivocate on the term 'true.' Two different notions of truth are in play here. One is monadic utterance truth, the other relative propositional truth. A better-tasting and more easily digestible version of (A) would be: Your utterance, that is, the sentence relative to your context of use, is true simpliciter but the proposition you are expressing by your utterance is not true relative to me as the speaker, though it is true relative to you as the speaker.

Temporalism

As temporalism is committed to the view that the contents of a sentence uttered at different times needn't have a different content, temporalism is a special version of non-indexical contextualism. Temporalism is closely related to what Cappelen and Hawthorne call 'temporality.' Temporality is the view that some propositions that are true simpliciter will be false or were false. According to Cappelen and Hawthorne, temporality entails temporalism if metaphysical eternalism is true, but not if presentism is true. According to presentism, only present things exist. President Obama, iPhones, and tigers exist; Bertrand Russell, dinosaurs, and flying cars do not. As there is only one time (the present) if presentism is true, temporalism is false: It is not the case that propositions can have different truth-values at different times. So the conjunction of temporality and presentism is compatible with Simplicity: Given the conjunction of temporality and presentism, 'Paul is dancing' expresses a temporally neutral proposition. As there is only one time, this proposition has a truth-value simpliciter. Suppose it is true. It could nonetheless have been false (before Paul started dancing), and it could become false in the future (when Paul stops dancing).

Or so Cappelen and Hawthorne argue. However, if the presentist construes past and future times as ersatz times, abstract propositional entities, then the presentist could assent to the claim that some propositions can have different truth-values at different times. But that is inconsistent with Simplicity. So the conjunction of temporality and ersatz temporalism is incompatible with Simplicity.[1] If past and future times exist, then

[1] Cappelen and Hawthorne (2009: 82) claim that the presentist can still evaluate propositions as true or false simpliciter without making reference to a time. It is not clear to me how that is possible if past and future times exist.

temporality entails temporalism. But temporalism is in direct conflict with Cappelen and Hawthorne's T1.

The conjunction of temporality and metaphysical eternalism is also incompatible with Simplicity. If metaphysical eternalism is true, past and future times are real. So temporality entails temporalism.

On a special version of metaphysical eternalism, the domain of objects is constant at all times, but all concrete things are present, whereas past and future things are abstract. Call this view the 'passage view.' The conjunction of the passage view and temporality is also incompatible with Simplicity. On the passage view, it is true that it was the case that (there is a time *t* which will never be present, and dinosaurs exist at *t*). Moreover, as the domain of objects is constant across times, the Barcan and converse Barcan formulas are true. Hence, 'it was the case that there is a time *t* which will never be present, and dinosaurs exist at *t*' entails 'there is an *x* such that it was the case that *x* is a time which will never be present and dinosaurs exist at *x*.' So there are two times: the present time and *x* (a past abstract time). But given temporality, there are temporally neutral propositions (that are true/false but were false/true or will be false/true). But, as there are two times (the present time and *x*), these temporally neutral propositions are not true or false simpliciter. Rather, they are true or false relative to the present time, and true or false relative to *x*. For example, if Paul is now dancing but was not dancing when there were dinosaurs, then 'Paul is dancing' is true relative to the present time but false relative to *x*. So the conjunction of temporality and the passage view is in conflict with Simplicity.

Recall that one of Kaplan's main arguments for temporalism is the argument from intensional operators. As Kaplan points out, if the tenses are operators and 'they are not to be vacuous, [then they must] operate on contents which are neutral with respect to features of circumstance the operator is interested in' (1989: 503). Tense operators are neutral with respect to time. Hence, tense operators must operate on temporally neutral contents. For example, the past tense in 'John was a soldier in WW II' must operate on the temporally neutral content *John is a soldier in WW II*.[2]

Temporalism is in direct conflict with the monadic truth package. So Cappelen and Hawthorne must reject Kaplan's argument as unsound. Assuming that they don't want to accept a non-ersatz version of presentism, one obvious way to refute the argument for them would be to maintain that the tenses are quantifiers and not operators, as argued by King (2003), or alternatively to maintain that the tenses *are* operators but deny that the temporally neutral contents operated on are propositions and are the objects of propositional attitudes.

[2] Or alternatively: *John was a soldier*.

However, this is not Cappelen and Hawthorne's strategy. Their strategy is to argue that the tenses in English are neither intensional operators nor quantifiers. 'Quickly' in 'quickly, he left the building' is not an operator but an adverb modifying the verb 'left.' the sentence containing the adverb provides an answer to the question 'How did he leave?' Similarly, Cappelen and Hawthorne argue, 'in Boston' in 'in Boston Paul is dancing' is not an intensional operator but is of a different syntactic category. For example, one might suggest that it provides an answer to the question 'where is Paul dancing?' According to Cappelen and Hawthorne, these considerations carry over to tense. 'Paul danced' is not to be parsed as 'it was the case that (Paul is dancing).' Like adverbs, Cappelen and Hawthorne say, the past tense is a modifier of sorts and does not enjoy sententiality.

Relativism Proper

As noted in Chapter 1, relativism proper with respect to an expression type T is the view that expressions of type T have contents that remain stable across contexts of use and contexts of assessment but have extensions that vary with contexts of assessment. Accordingly, relativism treats not only propositional truth but also utterance truth as relative to contexts of assessment. For example, if 'tasty' is a truly relative expression, then John's utterance of 'this is tasty' may be true relative to John in the role of assessor but false relative to Mary in the role of assessor.

Cappelen and Hawthorne's main argument against relativism proper is that the data typically used to motivate relativism can be accommodated equally well, or better, by a version of flexible (indexical) contextualism. For example, it is sometimes noted that if John says 'this chili is tasty,' then Mary can use 'John said that this chili is tasty' to report what John said even if she doesn't like the chili. But she cannot do this if the content of her utterance expresses the proposition that John said that this chili is tasty to Mary. This suggests that speaker contextualism that takes content to vary with the speaker's standards cannot accommodate the data.

Another common diagnostic of whether an expression is context-sensitive or assessment-sensitive is to look at whether there can be meaningful disagreement among disputants with different standards. For example, we can imagine John and Mary get into an argument over whether a certain chili is tasty. Relativists sometimes take this to indicate that 'tasty' is assessment-sensitive, not context-sensitive. After all, if it had been context-sensitive in the standard way, then 'this chili is tasty' would, when uttered by John, express the proposition that this chili is tasty to John, and 'this chili is not tasty' would, when uttered by Mary, express the proposition that this chili is not tasty to Mary. But *this chili is tasty to John* and *this chili is not tasty to Mary* are not contradictory propositions. Hence, standard contextualists cannot accommodate disagreement data.

However, Cappelen and Hawthorne think diagnostics that focus on the verb construction 'say that' (and 'believe that') or rely on conversational disputes are unreliable as diagnostics of whether an expression is context-sensitive or assessment sensitive. First, mixed quotation is hard to hear. When the sentence 'John said that "this chili is tasty"' is read out loud, the quotation marks cannot be heard. Second, collective reports of the form 'A and B said that p' have true readings even when 'p' contains an obviously context-sensitive expression, as in 'A said that Angie is ready to take the exam, and B said that Angie is ready to leave. So A and B both said that Angie is ready.' Third, flexible contextualism need not build the speaker into the proposition expressed by the relevant utterance but can by virtue of being flexible build in any other person, depending on what is presupposed in the conversational context.

According to Cappelen and Hawthorne, a better diagnostic of whether an expression is context-sensitive rather than assessment-sensitive focuses on 'agree that' rather than 'say that' or disagreement data. Even if 'A believes *p*' and 'B believes *p*' are true reports, 'A and B agree that *p*' does not have a true reading when '*p*' contains a context-sensitive expression. Witness the oddity of 'A believes Angie is ready to take the exam, and B believes Angie is ready to leave. Hence, A and B both agree that Angie is ready.' As I have argued in Chapter 3, Cappelen and Hawthorne's diagnositic test is not a good test for diagnosing context-sensitivity more generally. But let it be granted for argument's sake that it is a fairly reliable diagnosis of context-sensitivity.

Flexible contextualism, as noted, takes the expressions that seem to vary with an assessor to be associated with a hidden variable which can take on values other than the speaker. Flexible contextualism is standardly accepted for expressions like 'local,' 'left,' and 'nearby.' For example, 'Mel went to a nearby beach' expresses a proposition of the form 'Mel went to a beach nearby to *l*' and the value of the location parameter is supplied by the conversational context. If the speaker and hearer are in NYC but it is presupposed by the speaker and hearer that Mel is visiting her grandmother in Florida, then 'Mel went to a nearby beach' may express the proposition that Mel went to a beach nearby to where her grandmother lives.

The flexible view can also accommodate collective reports. If A thinks Angie went to a beach nearby to A, and B thinks that Angie went to a beach nearby to B, then it is acceptable to say 'A and B believe that Angie went to a nearby beach.' This reading can be accommodated with lambda abstraction. 'A and B believe that Angie went to a nearby beach' has the underlying form 'A and B λ(*x* believes that Angie went to a beach nearby$_{\text{(to x)}}$.'

I think this is a nice move but it is not clear to me how it is supposed to generalize more widely. Consider 'A and B were both told by their mothers that Angie went to a nearby beach.' Suppose the two mothers and A and B are in four different locations, and suppose it is clear in the context that A was told that Angie went to a beach nearby to A's mother, and that B was told that Angie went to a beach nearby to B. Then it would seem that the only way to handle

the case is to treat it as the conjunction 'A was told by her mother that Angie went to a beach nearby to l_1, and B was told by her mother that Angie went to a beach nearby to l_2.'

But that aside, it seems that flexible contextualism can handle expressions like 'nearby.' If A thinks Angie went to a beach nearby to A, and B thinks that Angie went to a beach nearby to B, then it is unacceptable to say 'A and B agree that Angie went to a nearby beach.' Flexible contextualism can explain why it is unacceptable. It is unacceptable because there is no one value to assign to the variable associated with 'nearby,' and lambda abstraction does not work with 'agree,' as agreement requires a commonly agreed upon value assignment.

According to Cappelen and Hawthorne, flexible contextualism extends to the sorts of expressions that have typically been treated as relativistic. They focus on predicates of personal taste, such as 'filling,' 'fun,' and 'tasty.' On their flexible semantics, 'that is filling' has the underlying form 'that is filling to *x*,' where the value of '*x*' is determined by the conversational context. 'Said that' diagnostics, disagreement diagnostics and exocentric uses of taste vocabulary (Lasersohn 2009) all fail to show that relativism proper can accommodate data which flexible contextualism cannot accommodate. For example, if Big Guy kindly reminds Small Guy 'remember, a medium-sized pie at this restaurant will be too filling,' and Small Guy kindly reminds Big Guy 'remember, a medium-sized pie at this restaurant will not be filling enough,' there is no sense in which there is disagreement, and the exocentric uses of the taste vocabulary illustrated by this example are adequately accommodated by flexible contextualism.

Of course, Big Guy and Small Guy could get into an argument over whether a certain pie is too filling or not, but if they did, then it would tempting to judge that they were simply speaking past each other. It is certainly true that we do not have strong intuitions in such cases concerning whether or not there is a proposition whose relative truth-value the disputants disagree about.

I think Cappelen and Hawthorne are essentially right that a flexible contextualism can accommodate the data from predicates of personal taste as well as relativistic semantics can. However, to show that Simplicity is true it does not suffice to show that predicates of personal taste are context-sensitive. There are other data that are not as easily accommodated by Simplicity, namely data from perception. I now turn to my main argument against Simplicity (and hence against the monadic truth package).

8.2. THE ARGUMENT FROM PERCEPTION

My main argument against the monadic truth package offered by Cappelen and Hawthorne runs as follows:

(1) Perceptual experience is a propositional attitude.

(2) The objects of perceptual experience do not instantiate the fundamental monadic properties of truth simpliciter and falsity simpliciter.
(3) By T3, the objects of perceptual experience are propositions.
(4) Hence, propositions do not instantiate the fundamental monadic properties of truth simpliciter and falsity simpliciter.

The premises in need of justification in the present context are premises 1 and 2. It may seem that the most obvious way to preserve Simplicity is to reject premise 1. Cappelen and Hawthorne might say that perceptual experience is an attitude to something other than a proposition, perhaps a kind of semantic value that does not have a full propositional form. But, given Simplicity, this move is not very plausible. Some hold that perceptual experience is belief (e.g., Byrne 2009 and Glüer 2009). But even if one denies that perceptual experience is belief, one ought to grant that in favorable circumstances perceptual experience can give rise to a belief with the same content. In other words, if I have a conscious perceptual experience with content *p*, then that ought to give rise to a belief with content *p* in favorable circumstances. It follows that if the content of perception is not propositional, neither is the content of beliefs that are formed directly on the basis of perceptual experience. Hence, Cappelen and Hawthorne must hold, not only that perceptual experience is not a propositional attitude, but also that belief in general is not. But this contradicts T3, as formulated. So it would be unwise for them to reject premise 1.

Cappelen and Hawthorne must then reject premise 2. I will offer two arguments in favor of premise 2. The first argument rests on the empirical assumption that there is variability in color perception and the theoretical assumption that weak representationalism is true. This argument also can be seen as an argument against color relationalism, as defended by Jonathan Cohen (2004, 2009a, 2009b). According to color relationalism, the colors are relational properties that have viewing systems and viewing conditions as their relata. For example, this tomato is not simply red, but red-relative-to-me-and-my-current-viewing-conditions, red-relative-to-viewing-system-T-and-viewing-condition-C, and so forth. The second argument in favor of premise 2 rests only on the theoretical assumption that weak representationalism is true.

Variability: It is empirically verified that color perception varies greatly across perceivers. Your best sample of red may be my best sample of orange (for discussion see, e.g., Cohen 2004, Brogaard 2009 and 2010a). This sort of variability in color perception has been taken by some to suggest that color properties in the content of perception are relational properties to viewing systems and viewing conditions (see Cohen 2004, 2009a, 2009b) and by others to suggest that they are non-relational color constituents that have extensions only relative to viewing systems and viewing conditions (see Brogaard 2010a, 2010b). There are two alternative ways of accommodating variability:

One can hold that the color properties in the content of perception do not have extensions (Pautz 2006) or have only imperfect extensions (Chalmers 2006a) or that whenever there is disagreement about an object's color, at least one of the disputants is wrong (Tye 2000; Byrne and Hilbert 2003). The former view entails that color experience is never veridical. The latter view entails a version of epistemicism about what the colors of objects are: There is, in many cases of disagreement about the colors of objects, no way of coming to know who (if any) is right.

Representationalism: Representationalism, in its weakest formulation, is the view that the content of perceptual experience supervenes on its phenomenology. On this view, there cannot be a difference in the content of a perceptual experience without a corresponding difference in the phenomenology of the experience. Given its weakest formulation, representationalism is exceedingly plausible (Tye 2000; Chalmers 2004; Siegel 2010). People who deny that perceptual experience has content and people who are internalists about phenomenal character but externalists about content will deny it. But it is fair to say that these latter views are minority views (see the recent PhilPapers Survey, http://philpapers.org/surveys/).

First Argument for Premise 2: My first argument for premise 2 runs as follows. It is plausible that you and I, in spite of having radically different perceptual systems and in spite of being in radically different viewing conditions, can have the same phenomenally red experience (veridical or non-veridical). By weak representationalism, our experiences have the same content. If color constituents in the content of perception are relational properties that have viewing systems and viewing conditions as relata, then our phenomenally red experiences have different contents. One has the content *that is red relative to V1*, and the other has the content *that is red relative to V2*.[3] Hence,

[3] One move suggested to me by Jonathan Cohen in conversation is to claim that the parameters can take pretty coarse-grained values, such that perceivers V1 and V2 both count as instances of the same type. The perceiver parameter doesn't need to be as fine-grained as an individual visual system or a time slice thereof. He takes it to be an open question how coarse or fine-grained the visual system and for that matter belief represents in these contents. In fact, a natural move here, he says, is to say that the visual system represents *both* the fine-grained content and the coarse-grained content. So there's a level of perceptual content had by the experiences on which they agree as well as a separate level of perceptual content had by the experiences on which they differ. This move, he says, would solve my worry about shared content. Effectively, this is just the thought that flexible contextualism about perceptual contents allows for a different, flexibly assigned value for the relatum in relational perceptual contents such that different perceivers can share one and the same perceptual content. My main problem with this move is that while it is clear that the implicit values of hidden variables in sentences can be assigned values other than the speaker, it is not clear to me how this would work in the case of perception. In the case of perception there are no sentences to carry the hidden variables. It seems to me that Cohen's move just amounts to denying that two different perceivers could have radically different viewing systems and yet have experiences with the same phenomenal character.

pace Cohen (2004, 2009a, 2009b) it is not the case that color properties in the content of perception are relations to viewer systems and viewing conditions. Rather, color constituents in the content of perception are non-relational entities that have extensions relative to viewer systems and viewing conditions, or irrealism or epistemicism is true. It follows that the content of perception are not true or false simpliciter, or irrealism or epistemicism is true.

Second Argument for Premise 2: When I look at two trees at different distances from me, I can see that one tree is further away from me than the other. Moreover, it is plausible that you and I can have perceptual experiences with the same phenomenology of the two trees (perhaps at different times). By weak representationalism, our experiences have the same content. So our perceptual experiences cannot contain you or me in the content of perception. Rather, they must contain semantic values that have extensions only relative to perceivers. Hence, the contents of our experiences do not instantiate the fundamental monadic properties of truth simpliciter and falsity simpliciter.

How might Cappelen and Hawthorne respond to these arguments? In regard to the first argument for premise 2 the options are to (i) reject weak representationalism, (ii) adopt irrealism, or (iii) adopt epistemicism. I shall not offer any speculations as to what they would opt to do. The second argument for premise 2 is harder to get around. In order to get around it Cappelen and Hawthorne must reject weak representationalism. As weak representationalism is far more plausible than Simplicity, Simplicity is likely false. Hence, it is not very likely that all propositions instantiate the fundamental monadic properties of truth simpliciter and falsity simpliciter.

8.3. NON-INDEXICAL CONTEXTUALISM

I will now offer an argument against Cappelen and Hawthorne's claim that non-indexical contextualism is not an 'interesting position in logical space.' Their main argument against non-indexical contextualism was that it has unintuitive consequences. It entails that the following exchange should be acceptable:

> JOHN: Sample A is the best case of red.
> MARY: No, sample A is not the best case of red. Non-indexical contextualism is true. Hence, while your utterance is true, the proposition you are expressing by your utterance is not true.

John MacFarlane (2009) has replied that the notion of utterance truth is a technical term. Hence, our intuitions about these cases are notoriously unreliable. Cappelen and Hawthorne reply to this that 'if utterance truth is an uninteresting, utterly technical notion, then it is hard to see how it can matter to the debate' (23). According to Cappelen

and Hawthorne, unless a different argument can be given in favor of non-indexical contextualism and against relativism, then what matters to the debate is only what non-indexical contextualism and relativism proper have in common. I agree with Cappelen and Hawthorne about this: A different argument is needed in order to settle the debate between non-indexical contextualism and relativism proper. However, all I need to do here in order to show that non-indexical contextualism occupies an interesting position in logical space is show that it does better than relativism proper with respect to a specific class of expressions. I shall focus on color terms.

Setting aside epistemicism and irrealism, and assuming weak representationalism, my argument for premise 2 in the previous section establishes that the color properties in the content of color perception have extensions only relative to perceivers and viewing conditions. Since our job now is to determine whether non-indexical contextualism has anything to offer which relativism cannot offer, we are justified in disregarding epistemicism and irrealism. The task before us then is to determine the nature of the individuals in the extension of color contents of color experience. If the individuals in the extension of the color content of color experience are the perceivers who actually undergo the color experience, then non-indexical contextualism will be true for some types of color discourse. If the individuals are the perceivers who assess the content of color experience for truth, then relativism proper will be true for some types of color discourse. But it is easy to see that the color contents of color experiences have extensions relative to the perceivers who have the color experiences rather than relative to the perceivers who assess the content for truth. Consider the following example.

John and Mary are asked to view a dozen color samples and determine which sample is the best case of red. John perceives sample A as the best case of red and forms a belief to the effect that sample A is the best case of red directly on the basis of his perceptual experience. Mary perceives sample B as the best case of red and forms a belief to the effect that sample B is the best case of red directly on the basis of her perceptual experience.

If colors have extensions relative to perceivers, then John's perceptual experience is veridical just in case sample A is the best case of red relative to him, and Mary's perceptual experience is veridical just in case sample B is the best case of red relative to her. So when John sincerely utters 'sample A is the best case of red,' then Mary ought to assess the content of John's utterance as true just in case sample A is the best case of red relative to John. Likewise, if Mary sincerely utters 'sample B is the best case of red,' then John ought to assess the content of Mary's utterance as true just in case sample B is the best case of red relative to Mary. But this suffices to show that non-indexical contextualism, but not standard non-flexible relativism, is true for first-person uses of color terms. For, if relativism had been true, then the content of John's utterance would be false relative to Mary as the assessor, and the content of Mary's utterance would be false relative to John as the assessor.

Of course, John and Mary may well get into a dispute about whether sample A is the best case of red. However, as Cappelen and Hawthorne point out repeatedly throughout their book, we cannot take conversational disagreement data at face value (see, e.g., 101). Mary and John's disagreement is a kind of verbal dispute. At best it shows that John and Mary disagree about the relative truth-value of a certain proposition. It does not show that the content of John's utterance is true relative to Mary, or that the content of Mary's utterance is true relative to John. When John sincerely says that sample A is the best case of red, his utterance is grounded in his belief that sample A is the best case of red. This belief, in turn, is grounded in his perceptual experience of A being the best sample of red. But the content of his experience is true relative to him, not relative to Mary. Hence, the content of his utterance is true relative to him, not relative to Mary. So relativism offers the wrong account of first-person uses of color terms. With respect to first-person uses of color-terms, non-indexical contextualism thus occupies a more interesting position in logical space than does relativism proper.

8.4. TEMPORALISM DEFENDED

Cappelen and Hawthorne's main argument against the operator-view of the tenses, and hence implicitly against temporalism, is that there is no good reason to treat sentences of the form 'Paul danced' as being of the form 'it was the case that (Paul dances).' It is less obvious that the same point can be made with respect to natural-language sentences such as 'it will be the case that Paul is dancing.' This latter sentence seems to be composed of a future-tense operator 'it will be the case that' and the sentence 'Paul is dancing.' I would be curious to hear how Cappelen and Hawthorne propose to handle those kinds of cases. However, I shall not focus on those kinds of cases here. Instead I shall offer a simple argument in favor of temporalism and hence implicitly in favor of the operator-view of tense.

Though my argument could be made on the assumption that weak representationalism is true, a strengthened form of the argument rests on a much weaker assumption, which I will call the Property Supervenience Thesis:

> Property Supervenience Thesis (PST)
> If S* consciously represents *p* with associated phenomenology C, then necessarily, if someone is in a conscious state S with phenomenology C, S consciously represents *p*.

Example: If I consciously desire to sleep, my conscious desire represents the property of sleeping with associated phenomenology C. By PST, all desires with phenomenology C consciously represents the property of sleeping.

The connection between weak representationalism and PST is this: Conscious mental states consciously represent all and only those properties that occur in the content of the state. So PST is equivalent to weak representationalism when the latter is restricted to property constituents.

Here is one consideration in favor of PST. Grapheme-color synesthetes see black graphemes as instantiating colors. Sometimes they see black graphemes as instantiating colors that humans cannot veridically observe (e.g., ultraviolet). In such cases it is exceedingly plausible that the fact that a perceptual experience represents a given color property P is fully determined by the phenomenology, C, associated with that property. But veridical and illusory perceptual states with the same phenomenology plausibly do not differ in which properties they consciously represent. So, necessarily, all perceptual states associated with phenomenology C consciously represent P.

Here is another consideration in favor of PST. When we view a tilted coin, we see the coin as circular-shaped and as oval-shaped. The oval-shapedness of the coin is a viewpoint-dependent property. It changes when the viewpoint of the perceiver changes. In cases like this it is very plausible that phenomenology C associated with the experience (which may include the phenomenology of recalls of past experiences) fixes which pair of viewpoint-independent and viewpoint-dependent properties the experience consciously represents (Brogaard 2010c and 2011). But if this is so, then necessarily, all perceptual states associated with phenomenology C consciously represent circular-shapedness and oval-shapedness.

These reflections are considerations in favor of PST, not an argument for it. For the purpose of establishing temporalism, however, I don't need to establish that PST is true for all properties and mental states. If there is a single propositional attitude with an associated time-neutral phenomenology for which PST holds, my argument goes through.

Here is a candidate to be a case of this kind. John is witness to a murder. He sees the murderer escape in a red Ford and forms a belief to the effect that the car is red directly on the basis of his perceptual experience. Now John could have had an experience with the very same phenomenology if the murder had taken place 15 minutes later than it did. By PST, the properties that John's experiences represent supervene on the phenomenology of his experiences. So if there is a difference in the properties John's experiences consciously represent, then there is a difference in the phenomenology of the two experiences. Since the phenomenology is the same on the two occasions, John's two experiences consciously represent the same properties. As the specific time is different on the two occasions, John's experiences do not consciously represent any specific time. But the content of perceptual experience contains only properties the experience consciously represents. So no specific time occurs in the contents of John's

experiences. So if perceptual experiences are propositional attitudes, then we can conclude that there are temporal propositions and hence that temporalism is true.

If perceptual experiences are not propositional attitudes, then there are other routes to the same conclusion. Here is one such route: Since John's belief that the car is red is formed directly on the basis of his perceptual experience of a car being red, it is plausible that John's belief has the same content as his perceptual experience. As John's perceptual experience of the car being red does not contain a time constituent, John's belief that the car is red does not contain a time constituent either. Hence, the content of John's belief is temporal. Since propositions are the objects of beliefs, the content of John's belief is a proposition. So there are temporal propositions.

There may well be other mental states that have a phenomenology that doesn't make reference to times. Conscious memories, desires, wishes, and hopes are plausible candidates. I could have two desires to take a nap at different times in my life but with the same phenomenal feel to them. The phenomenology of my desires then does not represent times. But PST is no doubt true for at least some conscious desires. If PST is true in this case, then my desires do not consciously represent specific times. So the contents of my desires do not make reference to specific times.

Of course, in the envisaged scenario, my desire is that I take a nap now, not that I take one tomorrow. But I could care less about what time it is now. So the time at which the desire occurs does not enter into the content of the desire. As only temporalism allows for the possibility of desire states that have temporally neutral contents, that is, desire states that have contents that do not make reference to a specific time, temporalism is true.

What we just said about perception and desire carries over to other mental states. Suppose on two different occasions t_1 and t_2 I remember that you have at least once worn a pink shirt. There needn't be anything to set apart the phenomenology of my memories at t_1 and t_2. So if PST holds in this case, then my memories needn't consciously represent specific times. So specific times needn't occur in the content of my memories. But only temporalism offers an account of content that allows for the possibility that my memory states have the same contents at different times. This argument then offers strong support in favor of temporalism.

8.5. SIGNPOST

In this chapter I have presented what I consider the strongest argument for temporalism. The argument runs as follows. It is plausible that the phenomenology of perceptual experience, conscious desires, perception-based beliefs, and other mental states determines the content of mental states. But the phenomenology of some of these

mental states does not discriminate among different times. For example, it seems plausible that a desire to the effect that there is mango ice cream in front of me could have the same phenomenology when held at different times. But if the phenomenology of desires determines their content, then their content cannot contain a specific time among its constituents. So the contents of conscious desires are temporal propositions. I have shown that similar arguments can be used to argue for a more general thesis to the effect that not all propositional content has a truth-value simpliciter.

CLOSING REMARKS

Since Frege there has been broad agreement that all propositions are eternal. Eternalists think that because many of the sentences we utter fail to make explicit reference to a time, we are misled into thinking that propositions can change their truth-values over time. We are misled, but we need not have been—not as far as eternalists are concerned. What Quine called 'eternal sentences' make explicit what, if truth be told, is expressed by the underhanded sentences. 'Brit loves Susanna's new sweater at 3 p.m. April 5, 2006 (CST)' discloses what 'I love your new sweater' leaves out of sight.

Lack of time determination is a delinquent. But the tenses are culprits as well, as far as some eternalists are concerned. Tense, these eternalists say, is a 'needless complication' of natural language—something that would naturally drop out of a perfect language, suitable for the expression of the thoughts of mathematics and the natural sciences. In *Word and Object* Quine expresses just this view:

> Our ordinary language shows a tiresome bias in its treatment of time. Relations of date are exalted grammatically as relations of position, weight, and color are not. This bias is of itself an inelegance, or breach of theoretical simplicity. Moreover, the form that it takes—that of requiring that every verb form show a tense—is peculiarly productive of needless complications, since it demands lip service to time even when time is farthest away from our thoughts. (1960: 170)

Quine thinks paraphrasing away the tenses distorts English, but not in a significant way. In the language of thought there are no tenses. Though not all eternalists agree with Quine that the tenses are a needless complication, treating the tenses as intensional operators has fallen out of favor. The tenses can, and should, be paraphrased away, not for the reasons given by Quine, but because the evidence demands it. 'John was a firefighter' becomes 'John is a firefighter at a past time *t*,' and 'John will be a firefighter' becomes 'John is a firefighter at a future time *t*.'

In this monograph I have defended the at-all-times-disgraced opposition—also known as 'temporalism.' According to temporalism, temporal contents satisfy at least the following minimal criterion for being propositions: Some truth-valuable sentences

express, relative to context, temporal contents, and some propositional attitudes have temporal contents as their objects.

On a broader view of propositions, propositions play a wider number of theoretical roles (Frege 1952): Propositions are (i) the semantic values of truth-evaluable sentences, (ii) the objects of the attitudes (e.g., belief, doubt, hope, wish, and so on), (iii) the objects of agreement and disagreement, (iv) what is transferred or shared when people communicate successfully, and (v) the contents operated on by intensional operators (e.g., 'it is possible that').

The chief goal of this monograph has been to show that temporal contents satisfy the broader characterization of propositions. My argument strategy was as follows. In Chapter 1 I argued that temporal contents are truth-evaluable; in Chapter 2 I argued that temporal contents can be the objects of propositional attitudes; in Chapter 3 I argued that temporal contents can be the objects of agreement and disagreement and the contents that are passed on in success communication; in Chapters 4 and 5 I argued that there are tense operators in English; in Chapter 6 I argued that the tense operators are intensional operators that operate on temporal contents; in Chapter 7 I argued that both eternal and temporal contents satisfy the broader criterion for being a proposition; and finally, in Chapter 8 I argued against the recently defended view that all propositions have their truth-values simpliciter.

In the process of showing that temporal contents satisfy the five conditions on propositions and hence are propositions in the full sense, I presented several new arguments for temporalism and against eternalism. In the final chapter I offered a self-standing argument against eternalism. This argument turned on the plausible assumption that the phenomenology of some of our propositional attitudes needn't pay any attention to time. I could desire to take a nap now and desire that again in 15 minutes, and it could well be that my two desires had exactly the same phenomenology. But on the plausible assumption that the phenomenology of conscious mental states determines their content, these two desires then must have the same content. Yet they cannot have the same content if times corresponding to the time at which the desire is felt occur in their contents. So times corresponding to the time at which the desire is felt do not occur in their contents. So the desires have temporal contents. As desires are propositional attitudes, desires can have temporal propositions as their contents.

To me the popularity of eternalism remains a mystery. But I think the historical reasons for its popularity are easily discernible. Historically its popularity may be traced perhaps to the fact that its early proponents were not primarily concerned with ordinary language or mental states. From the point of view of the sciences and mathematics, temporal propositions have little interest. The laws of nature and the theorems of mathematics do not change their truth-values over time. As Frege puts it:

> If it should turn out that the law of gravitation ceased to be true from a certain moment onwards, we should conclude that it was not true at all, and put ourselves out to discover a new law: the new one would differ in containing a condition which would be satisfied at one time but not at another. (1979: 135)

There is no doubt that Frege was right about the language of mathematics and the natural sciences: If one's primary concern is to build a language suitable for mathematics and the natural sciences, one can, and should, discount temporal propositions.

But such a view of language, divorced from considerations of the semantic workings of ordinary language and mental representations, has limited appeal. Today most linguists and philosophers of language and mind are interested in developing a semantics that does not simply treat ordinary language as fundamentally flawed and mental states as uninteresting or irrelevant. Ordinary language and mental states have independent interest as objects of study. And, I have argued, considerations of the semantic workings of ordinary language and mental representations will enjoin us to take temporal propositions seriously.

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BIBLIOGRAPHY

Abbott, B. 2002. "Donkey Demonstratives." *Natural Language Semantics* 10:285–98.

Abusch, D. 1988. "Sequence of Tense, Intensionality and Scope." In Proceedings of WCCFL 7:1–14, ed. H. Borer.

———. 1997. "Sequence of Tense and Temporal De Re." *Linguistics and Philosophy* 20:1–50.

Aristotle. 1984. Vol. 2 of *Complete Works of Aristotle*, ed. J. Barnes. Princeton, NJ: Princeton University Press.

Aronszajn, M. 1996. "In Defense of Temporalism." *Philosophical Studies* 81:71–95.

Atkin, A. 2006. "There's No Place Like 'Here' and No Time Like 'Now' . *American Philosophical Quarterly* 43:271–80.

Bach, K. 1997. "Do Belief Reports Report Beliefs?" *Pacific Philosophical Quarterly* 78, 215–41.

———. 1994. "Conversational Impliciture." *Mind & Language* 9:124–62.

———. 2005. "Context Ex Machina." In *Semantics vs. Pragmatics*, ed. Z. Szabó, 15–44. Oxford: Oxford University Press.

Bealer, G. 1998. "Propositions." *Mind* 107: 1–32.

Belnap, N., and M. Green, 1994. "Indeterminism and the Thin Red Line." *Philosophical Perspectives* 8:365–88.

Belnap, N., M. Perloff, and M. Xu. 2001. *Facing the Future: Agents and Choices in Our Indeterministic World.* Oxford: Oxford University Press.

Bennett, M., and B. Partee 1974. *Toward the Logic of Tense and Aspect in English.* In Compositionality in Formal Semantics: Selected Papers by Barbara H. Partee, 59–109. Oxford: Blackwell Publishing, 2004.

Bezuidenhout, A. 2003. "Context Shifting." Paper presented at the Philosophy of Language Conference, Yale University, Nov. 7–9.

———. 2005. "Indexicals and Perspectivals." *Facta Philosophica* 7:3–18.

Bigelow, J. 1996. "Presentism and Properties." In *Philosophical Perspectives* 10, ed. J. Tomberlin, 35–52. Cambridge, MA: Blackwell.

Boghossian, P. 2006. "What is Relativism?" In *Truth and Realism*, ed. P. Greenough and M. Lynch, 13–37. Oxford: Oxford University Press.

Boolos, G. 1984. "To Be Is To Be the Value of a Variable (Or To Be Some Values of Some Variables)." *Journal of Philosophy* 81: 430–50.

Bostock, D. 1988. "Necessary Truth and A Priori Truth." *Mind* XCVII:343–79.

Braddon-Mitchell, D. 2004. "Masters of Our Meaning." *Philosophical Studies* 188:133–52.

Bricker, P. 1989. "Quantified Modal Logic and the Plural De Re." In *Contemporary Perspectives in the Philosophy of Language II*. Midwest Studies in Philosophy, vol. 14, ed. P. French, T. Uehling, and H. Wettstein, 372–94. Notre Dame, IN: University of Notre Dame Press.

Brogaard, B. 2005. "Russell's Theory of Descriptions vs. the Predicative Analysis: A Reply Graff." Talk at the Eastern Division Meeting of the American Philosophical Association.

———. 2006a. "Adverbs and Quantifier Domain Restriction." Talk at the Central Division Meeting of the American Philosophical Association.

———. 2006b. "Tensed Relations." *Analysis* 66:194–202.
———. 2007a. "A Puzzle about Properties." *Philosophy and Phenomenological Research* LXXIV:635–50.
———. 2007b. "Descriptions: Predicates or Quantifiers?" *Australasian Journal of Philosophy* 85:117–36.
———. 2007c. "Span Operators." *Analysis* 67:72–79.
———. 2007d. "The But Not All: A Partitive Account of Plural Definite Descriptions." *Mind and Language* 22:402–26.
———. 2008a. "Moral Contextualism and Moral Relativism." *Philosophical Quarterly* 58:385–409.
———. 2008b. "In Defense of a Perspectival Semantics for 'Know.'" *Australasian Journal of Philosophy* 86:439–59.
———. 2009. "An Alternative to Color Relationalism." Paper presented at the Eastern Division Meeting of the APA.
———. 2010a. "Perspectival Truth and Color Primitivism." In *New Waves in Truth*, ed. C. Wright and N. Pedersen. Palgrave Macmillan.
———. 2010b. 'Color in the Theory of Colors? Or: Are Philosophers' Colors All White?" In *The Center Must Not Hold: White Women on The Whiteness of Philosophy*, ed. G. Yancy, 131–52. Lanham, MD: Lexington Books.
———. 2010. "Strong Representationalism and Centered Content" *Philosophical Studies* 151:373–92.
———. Forthcoming A, 2011. "Vision for Action and the Content of Perception." *Journal of Philosophy*.
———.Forthcoming B, 2011. "Presentism, Primitivism and Cross-Temporal Relations: Lessons from Holistic Ersatzism and Dynamic Semantics", in Roberto Ciuni, Kristie Miller and Giuliano Torrengo, eds. New Papers on the Present: Focus on Presentism, Philosophia Verlag
Cappelen, H., and E. Lepore, 2002. "Indexicality, Binding, Anaphora, and A Priori Truth." *Analysis* 62:271–81.
———. 2003. "Context-Shifting Arguments." In *Language and Philosophical Linguistics.* Philosophical Perspectives Vol. 17, ed. J. Hawthorne and D. Zimmerman, 25–50. Hoboken, NJ: Wiley-Blackwell.
———. 2005. *Insensitive Semantics: A Defense of Semantic Minimalism and Speech Act Pluralism.* Oxford: Blackwell, 2005.
———. 2007. "The Myth of Unarticulated Constituents." In *Situating semantics: essays on the philosophy of John Perry*, ed. M. O'Rourke and C. Washington, 199–214. Cambridge, MA: MIT Press.
Cappelen, H., and J. Hawthorne. 2009. *Relativism and Monadic Truth*. Oxford: Oxford University Press.
Carston, R. 1988, "Implicature, Explicature, and Truth-Theoretic Semantics." In *Mental Representations*, ed. R. Kempson, 155–81. Cambridge: Cambridge University Press.
Cartwright, R. 1966. "Propositions." In *Analytical Philosophy*, first series, ed. R. Butler, 81–103. Oxford: Basil Blackwell.
Castañeda, H. 1999. *The Phenomeno-Logic of the I: Essays on Self-Consciousness*. Bloomington, IN: Indiana University Press.
Chalmers, D. J. 1996. *The Conscious Mind: In Search of a Fundamental Theory*. Oxford: Oxford University Press.
———. 2002. "The Components of Content." In *Philosophy of Mind: Classical and Contemporary Readings*. Oxford: Oxford University Press.
———. 2004a. "Epistemic Two-Dimensional Semantics." *Philosophical Studies* 118:153–226.
———. 2004b. "The Representational Character of Experience." In *The Future for Philosophy*, ed. B. Leiter, 153–81. Oxford: Oxford University Press.

———. 2006a. "Perception and the Fall from Eden." In T. Gendler and J. Hawthorne (eds.), *Perceptual Experience*, 49–125. Oxford: Clarendon Press.

———. 2006b. "The Foundations of Two-Dimensional Semantics." In *Two-Dimensional Semantics: Foundations and Applications,* ed. M. Garcia-Carpintero and J. Macia. Oxford: Oxford University Press.

———. Forthcoming. "Propositions and Attitude Ascriptions," *Noûs*.

———. Manuscript. The multiplicity of meaning.

Chalmers, D. and F. Jackson. 2001. "Contextual Analysis and Reductive Explanation." *Philosophical Review* 110:315–61.

Chomsky, N. 1970. "Remarks on Nominalization." In *Readings in English Transformational Grammar,* ed. R. A. Jacobs and P. S. Rosenbaum, 184–221. Waltham, MA: Ginn.

Cohen, J. 2004. "Color Properties and Color Ascriptions: A Relationalist Manifesto." *The Philosophical Review* 113:451–506.

Cohen, J. 2009a. *The Red and the Real: An Essay on Color Ontology*. Oxford: Oxford University Press.

Cohen, J. 2009b. "Comments on Brogaard's 'An Alternative to Color Relationalism.' The Eastern Division Meeting of the APA.

Cohen, S. 1987. "Knowledge, Context, and Social Standards." *Synthese* 73, 3–26.

Cooper, R. 1979. "The Interpretation of Pronouns." In *Syntax and Semantics, Vol. 10: Selections from the Third Groningen Round Table,* ed. F. Heny and H. Schnelle, 61–92. New York: Academic Press.

Corazza, E., W. Fish, and J. Gorvett. 2002. "Who is I?" *Philosophical Studies* 107:1–21.

Crimmins. M. 1992 *Talk about Belief.* Cambridge, MA: MIT Press.

Crisp, T. 2003. "Presentism." In *The Oxford Handbook of Metaphysics*, ed. M. J. Loux and D. Zimmerman, 211–45. Oxford: Oxford University Press.

———. 2004. "Presentism and Triviality." In *Oxford Studies in Metaphysics,* Vol. I, ed. D. Zimmerman, 15–20. Oxford: Oxford University Press.

———. 2005. "Presentism and 'Cross-Time' Relations." *American Philosophical Quarterly* 42:5–17.

———. 2007. "Presentism and the Grounding Objection," *Noûs* 41:90–109.

Davies, M. 1981. *Meaning, Quantification and Necessity*. London: Routledge and Kegan Paul.

DeRose, K. 1995. "Solving the Skeptical Problem." *The Philosophical Review* 104:1–52.

———. 2004. "Single Scoreboard Semantics." *Philosophical Studies* 119:1–21.

———. Forthcoming. 'Bamboozled by Our Own Words': Semantic Blindness and Some Objections to Contextualism." *Philosophy and Phenomenological Research.*

Dowty, D. 1979. *Word Meaning and Montague Grammar: The Semantics of Verbs and Times in Generative Semantics and in Montague's PTQ*. Dordrecht: D. Reidel.

———. 1982. "Tenses, Time Adverbs, and Compositional Semantic Theory." *Linguistics and Philosophy* 5:23–55.

———. 1986. "The Effects of Aspectual Class on the Temporal Structure of Discourse: Semantic or Pragmatic?" *Linguistics and Philosophy* 9:37–61.

Dowty, D., R. Wall, and S. Peters. 1980. *Introduction to Montague Semantics*. Springer.

Dummett, M. 1991. *The Logical Basis of Metaphysics*. Cambridge: Harvard University Press.

Egan, A. 2004. "Second-Order Predication and the Metaphysics of Properties." *Australasian Journal of Philosophy* 82: 48–66.

———. 2006. "Reply to Brogaard." Commentary at the Central Meeting of the American Philosophical Association.

———. 2007. "Epistemic Modals, Relativism and Assertion." *Philosophical Studies* 133:1–22.

———. 2009. "Billboards, Bombs and Shotgun Weddings." In "Relative Truth," ed. B. Brogaard, special issue of *Synthese* 166:251–79.

Egan, A., J. Hawthorne, and B. Weatherson. 2004. "Epistemic Modals in Context." In *Contextualism in Philosophy,* ed. G. Preyer and G. Peter, 131–68. Oxford: Oxford University Press.

Enç, M. 1981. Tense without scope: An analysis of nouns as indexicals. PhD dissertation, University of Wisconsin, Madison.

———. 1986. "Towards a Referential Analysis of Temporal Expressions." *LP* 9:405–26.

———. 1987. "Anchoring Conditions for Tense." *Linguistic Inquiry* 18:633–57.

Evans, G. 1985. *Collected Papers*. Oxford: Clarendon Press.

Fara, D. 2001. "Descriptions as Predicates." *Philosophical Studies* 102:1–42. Originally published under the name 'Delia Graff.'

———. 2003 "Desires, Scope and Tense." *Language and Philosophical Linguistics.* Philosophical Perspectives Vol. 17, ed. J. Hawthorne and D. Zimmerman, 141–63. Hoboken, NJ: Wiley-Blackwell. Originally published under the name 'Delia Graff.'

Fine, K. 1975. "Vagueness, Truth and Logic." *Synthese* 30:265–300.

Fitch, G. W. 1998. "Temporalism Revisited" *Philosophical Studies* 92:251–56.

———. 1999. "Tense and Contents." *Philosophical Studies* 94:151–58.

Forbes, G. 1989. *Languages of Possibility.* Oxford: Basil Blackwell.

Frege, G. 1952. "On Sense and Nomination." In *G. Frege, Translations from the Philosophical Writings*, trans. P. Geach and M. Black. Oxford: Blackwell.

———. 1968. "The Thought: A Logical Inquiry" In *Essays on Frege*, ed. E. D. Klemke. Urbana, IL: University of Illinois Press.

———. 1979. "Logic." In *Posthumous Writings,* ed. H. Hermes, H. Kambartel, and F. Kaulbach, trans. P. Long and R. White, 126–51. Chicago: University of Chicago Press.

Galton, A. "Temporal Logic." In *The Stanford Encyclopedia of Philosophy,* Winter 2003, ed. E. Zalta. http://plato.stanford.edu/archives/win2003/entries/logic-temporal/.

Geach, P. 1957. "On Belief about Oneself." *Analysis* 18:23–24.

Geis, M. 1970. "Time Prepositions as Underlying Verbs." In *Papers from the Sixth Regional Meeting: Chicago Linguistics Society,* ed. M. Campbell et al. Chicago: University of Chicago, Chicago Linguistics Society.

Glasbey, S. 1993. "Distinguishing between Events and Times: Some Evidence from the Semantics of *Then.*" *Natural Language Semantics* 1:285–312.

Glüer, K. 2009. "In Defense of a Doxastic Account of Experience." *Mind and Language* 24:297–327.

Haslanger, S. 1989. "Endurance and Temporary Intrinsics." *Analysis* 49:119–25.

Hawthorne, J. 2004. *Knowledge and Lotteries.* Oxford: Oxford University Press.

Heck, R. 2006. "MacFarlane on Relative Truth." *Philosophical Perspective, Philosophical Issues,* ed. E. Sosa and E. Villanueva, 16:88–100.

Heim, I. 1982. The semantics of definite and indefinite noun phrases. PhD dissertation, University of Massachusetts, Amherst.

———. 1990. "E-Type Pronouns and Donkey Anaphora." *Linguistics and Philosophy* 13:137–77.

Higginbotham, J. 2002. "Why is Sequence of Tense Obligatory?" In *Logical Form and Language,* ed. G. Preyer and G. Peter, 207–27. Oxford: Clarendon Press.

Hinchliff, M. 1988. A defense of presentism. PhD dissertation, Princeton University.

Hofweber, T. 2005. "A Puzzle about Ontology." *Noûs* 39:256–83.

Jackson, F. 1998. *From Metaphysics to Ethics: a Defense of Conceptual Analysis*, Oxford: Oxford University Press.

Jeshion, R. 2004. "Descriptive Descriptive Names." In *Descriptions and Beyond*, ed. A. Bezuidenhout and M. Reimer, 591–12. Oxford: Oxford University Press.

Jespersen, O. 1909–1949. *A Modern English Grammar on Historical Principles*. Heidelberg: Carl Winter.

Kadmon, N. 1987. On unique and non-unique reference and asymmetric quantification. PhD dissertation, University of Massachusetts, Amherst.

Kamp, H. 1968. Tense logic and the theory of linear order. PhD dissertation, University of California, Los Angeles.

———. 1971. "Formal Properties of 'Now.' *Theoria* 37:227–73.

———. 1981. "A Theory of Truth and Semantic Representation." In *Truth, Interpretation and Information,* ed. J. Groenendijk et al. Dordrecht: Foris.

Kamp, H. and U. Reyle. 1993. *From Discourse to Logic.* Dordrecht: Kluwer.

Kaplan, D. 1989. "Demonstratives." In *Themes from Kaplan,* ed. J. Almog, J. Perry and H. Wettstein. New York: Oxford University Press.

Karttunen, L. 1969. "Pronouns and Variables." In *Papers from the Fifth Regional Meeting of the Chicago Linguistic Society,* ed. R. Binnick et al. Chicago: University of Chicago, Department of Linguistics.

Keller, S. 2004. "Presentism and Truthmaking." In *Oxford Studies in Metaphysics,* Vol. I, ed. D. Zimmerman, 83–104. Oxford: Oxford University Press.

Kim, J. 1969. "Events and Their Descriptions: Some Considerations." In *Essays in Honor of Carl G. Hempel,* ed. N. Rescher, 198–215. Dordrecht: Reidel.

King, J. C. 1995. "Structured Propositions and Complex Predicates." *Noûs* 29:516–35.

———. 2003. "Tense, Modality, and Semantic Values." In *Language and Philosophical Linguistics.* Philosophical Perspectives Vol. 17, ed. J. Hawthorne and D. Zimmerman, 195–246. Hoboken, NJ: Wiley-Blackwell.

Kneale, W., and M. Kneale. 1970. "Propositions and Time." In *G. E. Moore: Essays in Retrospect*, ed. A. Ambrose and M. Lazerowitz. New York: Humanities Press, 1970.

Kölbel, M. 2002. *Truth Without Objectivity.* Routledge: London.

———. 2003. "Faultless Disagreement," *Proceedings of the Aristotelian Society* 104, 53–73.

Kripke, S. 1979. "A Puzzle about Belief," In *Meaning and Use,* ed. A. Margalit. Dordrecht: Reidel.

———. 1981. *Naming and Necessity*. Cambridge, MA: Harvard University Press.

Kusumoto, K. 1999. Tense in embedded contexts. PhD dissertation, University of Massachusetts, Amherst.

Ladusaw, W. 1977. "Some Problems with Tense in PTQ." *Texas Linguistic Forum* 6:89–102.

Lappin, S. 1989. "Donkey Pronouns Unbound." *Theoretical Linguistics* 15:263–86.

Larson, R. 2002. "Grammar and Intensionality." In *Logical Form and Language,* ed. G. Preyer and G., 228–62. Oxford: Clarendon Press.

———. 2003 " Time and Event Measure." In *Language and Philosophical Linguistics.* Philosophical Perspectives Vol. 17, ed. J. Hawthorne and D. Zimmerman, 247–58. Hoboken, NJ: Wiley-Blackwell.

Lasersohn, P. 2005. "Context Dependence, Disagreement, and Predicates of Personal Taste." *Linguistics and Philosophy* 28:643–86.

Lasersohn, P. 2009. "Relative Truth, Speaker Commitment, and Control of Implicit Arguments." In "Relative Truth," ed. B. Brogaard, special issue of *Synthese* 166: 359–74.

Lewis, D. 1975. "Adverbs of Quantification." In *Formal Semantics of Natural Language,* ed. E. L. Keenan. Reprinted in *Papers in Philosophical Logic,* 5–20. Cambridge: Cambridge University Press, 1998.

———. 1980. "Index, Context and Content." In *Philosophy and Grammar,* ed. S. Kanger and S. Ohman, 79–100. Reidel: Dordrecht. Reprinted in *Papers on Philosophical Logic,* 21–44. Cambridge: Cambridge University Press, 1998.

———. 1979. 'Attitudes *De Dicto* and *De Se*.' *The Philosophical Review* 88:513–43. Reprinted with postscript in *Philosophical Papers I,* 133–60. Oxford: Oxford University Press, 1983.

———. 1986. *On the Plurality of Worlds.* Oxford: Blackwell.

———. 1996. "Elusive Knowledge." *Australasian Journal of Philosophy* 74:549–67.

———. 1994. "Reduction of Mind." In *A Companion to the Philosophy of Mind,* ed. S. Guttenplan, 412–31. Blackwell, Oxford. Reprinted in *Papers on Metaphysics and Epistemology,* 291–324. Oxford: Cambridge University Press, 1999.

———. 2002. "Tensing the Copula." *Mind* 111:1–13.

———. 2004. "Tensed Quantifiers." In *Oxford Studies in Metaphysics,* Vol. I, ed. D. Zimmerman, 3–14. Oxford: Oxford University Press.

Loar, B. 1988. "Social Content and Psychological Content." In *Contents of Thought,* ed. R. H. Grimm and D. D. Merrill. Tucson: University of Arizona Press.

Loux, M. J., and D. Zimmerman, eds. 2003. *The Oxford Handbook of Metaphysics.* Oxford: Oxford University Press.

Ludlow, P. 1999. *Semantics, Tense, and Time: An Essay in the Metaphysics of Natural Language*. Cambridge, MA: MIT Press.

———. 2004. "Presentism, Triviality, and the Varieties of Tensism." In *Oxford Studies in Metaphysics*, Vol. I, ed. D. Zimmerman, 21–36. Oxford: Oxford University Press.

———. 2005. "Contextualism and the New Linguistic Turn in Epistemology." In *Contextualism in Philosophy: Knowledge, Meaning and Truth,* ed. G. Peter and G. Preyer. Oxford: Oxford University Press.

MacFarlane, J. 2003. "Future Contingents and Relative Truth." *The Philosophical Quarterly* 53:321–36.

———. 2005. "The Assessment Sensitivity of Knowledge Attributions." In *Oxford Studies in Epistemology 1,* ed. T. Gendler and J. Hawthorne, 197–233. Oxford: Oxford University Press.

———. 2005b. "Making Sense of Relative Truth." *Proceedings of the Aristotelian Society* 105:321–39.

———. 2007a. "Semantic Minimalism and Nonindexical Contextualism." In *Context-Sensitivity and Semantic Minimalism: New Essays on Semantics and Pragmatics*, 240–50.

———. 2007b. "Relativism and Disagreement." *Philosophical Studies* 132:17–31.

———. 2008. "Truth in the Garden of Forking Paths." *Relative Truth*, Oxford University Press, 81–103.

———. 2009. "Non-Indexical Contextualism." In "Relative Truth," ed. B. Brogaard, special issue of *Synthese* 166:231–50.

———. Manuscript. Epistemic modalities and relative truth.

Markosian, N. 2004. A Defense of Presentism. In *Oxford Studies in Metaphysics,* Vol. I, ed. D. Zimmerman, 47–82. Oxford: Oxford University Press.

Massey, G. 1969. "Tense Logic! Why Bother?," *Noûs* 3:17–32.

May, R. 1977. The grammar of quantification. PhD dissertation, MIT.

McGrath, M., 2006. "Propositions." In *The Stanford Encyclopedia of Philosophy,* Spring 2006, ed. E. Zalta. http://plato.stanford.edu/archives/spr2006/entries/propositions/.

McGinn, C. 1982. *The Character of Mind*. 2nd ed., Oxford: Oxford University Press, 1997.

Merricks, T. 2007. *Truth and Ontology*. Oxford: Oxford University Press.

Moltmann, F. 1991 "Measure Adverbs." *Ling & Phil* 14:629–60.

———. 1997. *Parts and Wholes in Semantics.* New York: Oxford University Press.
Montague, R. 1973. "The Proper Treatment of Quantification in English." In *Approaches to Natural Language*, ed. K. Hintikka et al., 221–42.
Moore, G. E. 1962. "Facts and Propositions." In *Philosophical Papers,* 60–88. New York: Collier Books.
Neale, S. 1990a. "Descriptive Pronouns and Donkey Anaphora." *Journal of Philosophy* 87:113–50.
———. 1990b. *Descriptions.* Cambridge, MA: MIT Press.
Ogihara, T. 1989. Temporal reference in English and Japanese. PhD dissertation, University of Texas, Austin.
———. 1994. "Adverbs of Quantification and Sequence-of-Tense Phenomena." In *SALT IV,* ed. M. Harvey and L. Santelmann, 251–67. Ithaca, NY: Cornell University.
———. 1996. *Tense, Attitudes and Scope*. Dordrecht: Kluwer Academic Publishers.
———. Manuscript. The semantics of tense in embedded clauses.
Parsons, T. 1978. Pronouns as paraphrases. Unpublished manuscript.
———. 1990. *Events in the Semantics of English: A Study in Subatomic Semantics.* Cambridge, MA: MIT Press.
Pautz, A. 2006. Color eliminativism. Manuscript, University of Texas, Austin.
Partee, B. 1973. "Some Structural Analogies between Tenses and Pronouns in English." *Journal of Philosophy* 70:601–607. Reprinted in *Compositionality in Formal Semantics: Selected Papers by Barbara H. Partee,* 50–58. Oxford: Blackwell Publishing, 2004.
———. 1984. "Nominal and Temporal Anaphora." *Linguistics and Philosophy* 7:243–86.
———. 1986. "Noun Phrase Interpretation and Type-Shifting Principles." In *Studies in Discourse Representation Theory and the Theory of Generalized Quantifiers,* ed. F. Groenendijk, D. de Jongh, and M. Stokhof, 115–43. Dordrecht: Foris. Reprinted in *Compositionality in Formal Semantics: Selected Papers by Barbara H. Partee*, 203–30. Oxford: Blackwell Publishing, 2004.
Perry, J. 1977. "Frege on Demonstratives." *Philosophical Review* 86: 474–97.
———. 1986. "Thought Without Representation," *Proceedings of the Aristotelian Society*, vol. LX, 263–83.
———. 1998. "Indexicals, Contexts and Unarticulated Constituents." *Proceedings of the 1995 CSLI-Amsterdam Logic, Language and Computation Conference.* Stanford, CA: CSLI Publications.
Pianesi, F. and A. Varzi. 2000. "Events and Event Talk: an Introduction," In J. Higginbotham, F. Pianesi, and A. C. Varzi, eds. *Speaking of Events*, Oxford: Oxford University Press, 3–47.
Predelli, S. 1998a. 'I am not here now.' *Analysis* 58:107–12.
Predelli, S. 1998b. Utterance, Interpretation and the Logic of Indexicals. *Mind and Language* 13:400–14
Prior, A. N. 1957. *Time and Modality*, Oxford: Oxford University Press.
———. 1959, "Thank Goodness that's over," *Philosophy* 34, 12–17.
———. *1967. Past, Present and Future*, Oxford: Clarendon.
———. 1968a. *Papers on Time and Tense*, Oxford: Oxford University Press.
———. 1968b. "Now," *Noûs* 2:101–19.
Quine, W. V. 1960. *Word and Object*. Cambridge, MA: MIT Press.
Romdenh-Romluc, K. 2002. Now the French are Invading England! *Analysis* 62:34–41.
Recanati, F. 2004. "Indexicality and context-shift," Conference Paper, Workshop on Indexicals, speech acts, and logophors, Harvard University:, 11–20.
———. 2004b. *Literal Meaning*, Cambridge: Cambridge University Press.

———. Manuscript. Perspectival thought: A plea for (moderate) relativism.
Reimer, M. 2004. Descriptively Introduced Names," *Descriptions and Beyond*, Anne Bezuidenhout and Marga Reimer (eds.), Oxford: Oxford University Press: 613–29.
Richard, M., 1981, 'Temporalism and Eternalism,' *Philosophical Studies* 39, 1–13.
———. 1982, " Tense, Propositions and Meanings," *Philosophical Studies* 41, 337–51.
———. *1990. Propositional Attitudes*, Cambridge: Cambridge University Press.
———. 2004. "Contextualism and Relativism *Philosophical Studies* 119:215–42.
Rysiew, P. 2001. "The Context-Sensitivity of Knowledge Attributions." *Noûs* 35:477–514.
Salmon, N. 1986, *Frege's Puzzle*, The MIT Press/Bradford Books, Cambridge, MA.
———. 1989, "Tense and Singular Propositions" In *Themes From Kaplan*, Oxford University Press, New York, Almog, Perry, Wettstein (eds.).
———. 2003. "Tense and Intension," In A. Jokic, ed., *Time, Tense, and Reference* (Cambridge University Press), 107–54.
Sattig, T. 2006. *The Language and Reality of Time*, Oxford: Clarendon Press.
Schaffer, J. 2011. "Necessitarian Propositions", manuscript, http://www.jonathanschaffer.org/necprops.pdf
Schiffer, S. 1977. "Naming and Knowing," *Midwest Studies in Philosophy* 2, 28–41.
———. *1987. Remnants of Meaning* (MIT Press).
———. 1996. "Contextualist Solutions to Scepticism" *Proceedings of the Aristotelian Society* 96:317–33.
Schlenker, P. 2003. "A Plea for Monsters," *Linguistics & Philosophy* 26:29–120.
Moruzzi, S. and Crispin Wright, C. 2009. "Trumping Assessments and the Aristotelian Future," In B. Brogaard, ed. *Relative Truth*, special Issue of *Synthese* 166:309–31.
Sider, T. 1995. "Three Problems for Richard's Theory of Belief Ascription," *Canadian Journal of Philosophy* 25, 487–514.
———. 1999. Presentism and Ontological Commitment. *Journal of Philosophy* 96:325–47.
———. *2001. Four-Dimensionalism: An Ontology of Persistence and Time.* Oxford: Clarendon Press.
———. 2006. "Quantifiers and Temporal Ontology." *Mind* 115:75–97.
Siegel, S. 2010. *The Contents of Visual Experience*. Oxford: Oxford University Press.
Soames, S. 1987 "Direct Reference, Propositional Attitudes, and Semantic Content." *Philosophical Topics* 15, 47–8.
———. *2002. Beyond Rigidity*. New York: Oxford University Press.
———. 2004. "Naming and Asserting," In *Semantics vs. Pragmatics,* ed. Z. Szabó, 356–82. Oxford: Oxford University Press.
———. Forthcoming. "The Gap Between Meaning and Assertion: Why What We Literally Say Often Differs from What Our Words Literally Mean." In *Asserting, Meaning, and Implying*, ed. M. Hackl and R. Thornton.
Stalnaker, R., 1970. "Pragmatics." *Synthese* 22. Reprinted in Stalnaker, 1999.
Stalnaker, R., 1999. *Context and Content*. Oxford: Oxford University Press.
Stanley, J. 1997a, "Names and Rigid Designation." In *A Companion to the Philosophy of Language*, ed. B. Hale and C. Wright, 555–85. Oxford: Blackwell Publishers.
———. 1997b. "Rigidity and Content." In *Logic, Language and Reality: Essays in Honor of Michael Dummett*, ed. R. Heck, 131–56. Oxford: Oxford University Press.
———. 2000. "Context and Logical Form." *Linguistics and Philosophy* 23:391–424.
———. 2004. "On the Linguistic Basis for Contextualism." *Philosophical Studies* 119:119–46.
———. 2005a. *Knowledge and Practical Interests.* Oxford: Oxford University Press.

———. 2005b. 'Semantics in Context.' In *Contextualism in Philosophy: Knowledge, Meaning, and Truth,* ed. G. Preyer and G. Peter, 221–54. Oxford: Oxford University Press.

———. Manuscript. Against knowledge relativism. http://pwp.netcabo.pt/0154943702/Handout2.pdf

Stanley, J. and Z. Szabó. 2000. "On Quantifier Domain Restriction." *Mind and Language* 15:219–61.

Taylor, K. 2001. "Sex, Breakfast and Descriptus Interruptus." *Synthese* 128:45–61.

Torrengo, G. 2006. "Tenseless Cross-Temporal Relations." *Metaphysica* 7:117–29.

Tye, M. 2000. *Consciousness, Color, and Content*. Cambridge, MA: MIT Press.

van Rooy, J. 2001. "Exhaustivity in Dynamic Semantics: Referential and Descriptive Pronouns." *Linguistics and Philosophy* 24:621–57.

van Bentham, J. 1977. "Tense Logic and Standard Logic." *Logique et analyse* 80:395–437.

Vlach, F. 1973. 'Now' and 'Then.' A formal study in the logic of tense anaphora. PhD dissertation, UCLA.

von Fintel, K. 1994. "A Minimal Theory of Adverbial Quantification." In *Context-Dependence in the Analysis of Linguistic Meaning*, ed. B. Partee and H. Kamp. Elsevier.

Weatherson, B. Manuscript. Conditionals and relativism.

Wettstein, H. 1979. "Indexical Reference and Propositional Content." *Philosophical Studies* 36:91–100. Reprinted in *Has Semantics Rested on a Mistake and Other Essays,* 20–34. Stanford, CA: Stanford University Press, 1991.

Williamson, T. 2000. *Knowledge and Its Limits*. Oxford: Oxford University Press.

———. 2006. "Indicative versus Subjunctive Conditionals, Congruential versus Non-Hyperintensional Contexts." In *Philosophy of Language: Philosophical Issues 16*, ed. E. Sosa and E. Villanueva, 310–33.

Wright, C. 2006. "True Relativism." In *Truth and Realism*, ed. P. Greenough and M. Lynch. Oxford: Oxford University Press.

Zimmerman, D., ed. 2004. *Oxford Studies in Metaphysics I.* Oxford: Oxford University Press.

———. 2006. "Temporary Intrinsics and Presentism, with Postscript (2005)." In *Persistence*, ed. S. Haslanger and R. Kurtz, 393–424 Cambridge, MA: MIT Press.

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