

# Skow on Robust Passage and the Moving Spotlight Theory

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## 0. Introduction

Bradford Skow's *Objective Becoming* (2015) is a strikingly original and philosophically rich contribution to contemporary philosophy of time. The book rewards very careful study, and is surely a 'must-read' for anyone with an interest in current debates concerning time and change. Perhaps the most immediately compelling aspect of the book is its leading question: if I [Skow] didn't already accept the 'block universe theory' (BU),<sup>1</sup> which theory of time would I defend? Skow's surprising (and, from my perspective, welcome!) answer is that he would defend some version of the *Moving Spotlight Theory* (MST). However, Skow's *reason* for this answer is less familiar: it is that MST – unlike BU and its popular rival *Presentism* – 'contains robust passage'. Skow goes on to (quite convincingly, in my view) defend two versions of MST against a number of common objections: 'MST-Supertense' and 'MST-Time'.

There is no way to do justice to Skow's densely argued book in a short paper such as this; and, as listing the points on which we agree (of which there are many) would hardly further the relevant debates, it is natural to focus on some of the points on which we disagree, and on where (I think) the arguments of the book are less successful. Thus, in the first part of this paper (§1), I investigate the question of what it is for a theory to *contain robust passage* in Skow's sense. In particular, I argue that given Skow's arguments in favour of robust passage, he should probably *not* count MST-Time as a theory that contains robust passage. I also argue that there are better reasons to reject BU than those Skow describes. In the second part of the paper (§2), I focus on Skow's *MST-Supertense*. I argue that there are reasons for MSTers to reject MST-Supertense in favour of a more 'traditional' version of MST (the view I call 'Classic MST').

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<sup>1</sup> Skow's informal characterization of BU is as the view that 'spatiotemporal reality is nothing but a four-dimensional block universe' (p.4). Defenders of BU include Deng (2013) and Sider (2001).

## 1. What is Robust Passage?

The 'block universe' theory (BU) is – or is supposed to be – the theory of time that 'fits' best with the model of concrete reality employed in contemporary spacetime physics.<sup>2</sup> So why would anyone reject it? In order to know why anyone would reject BU, we need to know what the theory implies. BU is typically taken to imply at least the following three theses:

ETERNALISM: Reality contains a four-dimensional spacetime manifold in which objects and events are permanently located

TEMPORAL PARITY: There is nothing metaphysically special about the present time in virtue of which it is present

OPERATOR REDUCTIONISM: There are no metaphysically fundamental tense operators (such as 'it was the case that' ['P'] and 'it will be the case that' ['F'])

It follows, of course, that anyone with a reason to reject one of the above theses has a reason to reject BU. But I think that the *best* reason to reject BU is that it also implies:

PROPOSITIONAL ETERNALISM: Every proposition is if true always true  
(Formally:  $\forall p(p \supset Ap)$ )

Propositional Eternalism is the thesis that every proposition is *eternal* – an example of an eternal proposition is the proposition that it is sunny in Cork at 2pm GMT on 21 April 1984. Now, BU is seldom *explicitly* characterised as implying Propositional Eternalism.<sup>3</sup> But

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<sup>2</sup> See e.g. Skow (forthcoming, *Analysis Reviews*, pp.4-5): 'The block universe theory might still be more strongly supported by the evidence for relativity theory than is the moving spotlight theory. Although I believe this to be the case, I do not push the point in the book.'

<sup>3</sup> In particular, note that Skow does not characterise BU this way. But that is because he wishes to remain neutral on the question of whether there are such things as *propositions* (pp.20-21). However, he *does* characterise theories according to whether they 'contain robust change', where a theory T *contains robust change* just in case T implies that there is a metaphysically complete sentence  $\varphi$  such that sometimes,  $\varphi$  is true and sometimes,  $\varphi$  is false. And it is clear that on the relevant understanding of what it is for a sentence to be *metaphysically complete* (borrowed from Sider 2011), if a sentence  $\varphi$  is metaphysically complete and  $\varphi$  is sometimes true and sometimes false, then  $\varphi$  expresses a non-eternal – i.e. *temporary* – proposition. So those of us who are content with proposition-talk can simply treat the thesis that there is robust change as equivalent to the thesis that there are temporary propositions (as I do throughout this paper). Moreover, Skow characterises BU as being a theory that fails

there is a good reason to think that BU is inconsistent with the denial of Propositional Eternalism – namely, *Propositional Temporalism*:

PROPOSITIONAL TEMPORALISM: Some propositions are sometimes true and sometimes false

(Formally:  $\exists p(Sp \wedge S\neg p)$ )

The reason is that if there are temporary propositions – for example, the proposition that it is raining in Botley<sup>4</sup> – there must be a unique time  $t$  such that truth-at-a-time and truth simpliciter ‘line up’ at  $t$  – in other words, there must be a unique time  $t$  such that for any proposition  $p$ ,  $p$  is true at  $t$  iff  $p$  is true. Call such a time *accurate*. It seems hard to deny that if there is a unique accurate time  $t$ ,  $t$  is the *present*. But then there is something metaphysically special about the present time in virtue of which it is present (i.e. it is accurate). Call this thesis *Temporal Disparity*:

TEMPORAL DISPARITY: There is something metaphysically special about the present time in virtue of which it is present

Temporal Disparity is, of course, inconsistent with Temporal Parity, which as we saw above is typically taken to be an essential component of BU. So, it seems that those who accept BU must reject Propositional Temporalism in favour of Propositional Eternalism.

Why does the fact that BU implies Propositional Eternalism provide a good reason to reject BU? Those who reject BU because it implies Propositional Eternalism do so on the grounds that if every proposition is eternal, *nothing ever changes*. But of course, things do change (!) – so there are temporary propositions, and BU is false. Call this the *Argument from Change*. Indeed, those who reject BU because it implies Propositional Eternalism typically accept the stronger thesis that there is change over time *just in case* there are temporary propositions:

CHANGE THESIS: There is change over time if and only if there are temporary propositions

Why accept the Change Thesis? It’s not clear that there are any ‘non-question-begging’ arguments in favour of the Change Thesis, in the

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to contain robust change (p.27). So, it seems that *if* Skow were content proposition talk, he would describe BU as implying Propositional Eternalism.

<sup>4</sup> Of course, it is controversial whether this is an example of a temporary proposition, since it is controversial whether there *are* such propositions.

sense of arguments whose premises would be acceptable to those who reject the thesis. Those who accept the thesis simply judge that *things change just in case the facts change* – and the Change Thesis expresses this judgement.

I have described what I take to be the best reason for rejecting BU. However, when Skow imagines rejecting BU, he does *not* imagine doing so on the basis of the Argument from Change (or some variation thereof). Rather, he imagines rejecting BU on the grounds that it fails to ‘contain robust passage’:

To avoid misleading people it is better to allow that in a sense time passes if the block universe theory is true, but that that passage is “anemic”. The theory lacks “robust” passage of time. (p.2)

And:

We should say that there is “anemic” passage of time in the block universe but no “robust” passage of time. (p.18)

And when Skow imagines accepting MST, he imagines doing so on the basis that it contains robust passage *to the highest degree* – in particular, to higher degree than ‘Priorian presentism’.<sup>5</sup> But what is it for a theory to *contain robust passage*? And why does Skow think the failure of BU to contain robust passage provides grounds for rejecting BU? Skow does not provide an *analysis* of robust passage:

I do not think we should impose a litmus test that a theory must pass in order for it to contain robust passage... I do not see much interest in legislating on which ways of departure [from BU] make for robust passage and which do not. (p.32)

However, he is clear that it is *not* essential to a theory’s containing robust passage that it implies Propositional Temporalism (or in Skow’s terms, that it ‘contains robust change’ – see fn.3 above):<sup>6</sup>

Why think that a five-dimensional block universe lacks robust passage? One answer is that robust passage requires that time undergo robust change... I think that believers in objective becoming should be allowed to disagree about whether objective becoming requires robust change or not. (p.50)

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<sup>5</sup> *Priorian Presentism* combines the standard Presentist thesis that there are no merely past or future things with a rejection of the existence of events.

<sup>6</sup> Note that Skow uses ‘robust passage’ and ‘objective becoming’ interchangeably throughout the book (‘I will sometimes use it [‘objective becoming’] as another name for robust passage of time’ [p.18]). I will stick with ‘robust passage’ in what follows.

And:

We should not automatically reject a theory of objective becoming because it fails to contain robust change. (p.67)

It might seem, therefore, that robust passage must remain something of a mystery. However, I think we can at least discern some of the *necessary conditions* for a theory's containing robust passage by focusing on Skow's arguments from robust passage against BU and Priorian presentism. It is to those arguments I now turn.

We begin with Skow's argument against BU. According to Skow, an important part of the best case against BU and in favour of theories that contain robust passage is that theories that contain robust passage are *better placed to account for certain aspects of our experience* (p.3):

I think that the strongest case in favour of the moving spotlight theory starts with the claim that it explains some features of our experience better than the block universe does.

More specifically, Skow argues (pp.207-210) that theories that contain robust passage are better placed than BU to explain the difference between experiences I am *having* and experiences that I *had* or *will have*. The reason is that given BU, there is no relevant *fundamental* difference between experiences I am having and experiences I have had or will have, and therefore no explanation for why experiences I am having are uniquely 'available to me'. In contrast, according to theories that contain robust passage, there *is* a relevant fundamental difference between experiences I am having and experiences that I had or will have: that is, experiences I am having are located at the (metaphysically distinguished) present time, whereas experiences that I had or will have are not. Indeed, defenders of robust passage can add that *what it is* for an experience *e* to be 'available' to a subject *S* is for *e* to be experienced by *S* *at the present time* (p.211). Call this the *Argument from Experience* for robust passage.

In Chapter 12, Skow responds on behalf of BU to the Argument from Experience by arguing that BU is in fact just as well-placed as theories that contain robust passage to account for the 'availability' of some but not all of our experiences – and on that basis, he concludes that we should accept BU (hence Skow's description of *Objective Becoming* as 'a defence of the block universe theory's account of the passage of time' [p.2]). However, our focus here is on what the Argument from Experience tells us about the nature of *robust passage*. And what it strongly suggests is that for Skow, part of what it is for a

theory T to contain robust passage is for T to imply Temporal Disparity, the thesis that there is something metaphysically special about the present time in virtue of which it is present. After all, as we saw above, according to the Argument from Experience, the reason that theories that contain robust passage are better placed than BU to explain the ‘availability’ of our current experiences is that according to those theories, our current experiences are *located at the metaphysically distinguished present time*; so, theories that contain robust passage had better posit some metaphysical distinction between the present and other times.

There is a problem with this hypothesis, however: whilst Skow’s MST-Supertense<sup>7</sup> implies Temporal Disparity, *MST-Time* – according to which (i) every instant is present from and only from its own perspective (p.58) and (ii) ‘there are no perspective-independent facts’ (p.64) – does not.<sup>8</sup> This suggests that for Skow, it is *not* essential to a theory’s containing robust passage that it implies Temporal Disparity. However, Skow also writes (p.216):

In the end... I agree with the criticism that theories like MST-Time are bad because in them no single time is privileged. But I do not think that theories like this are bad just because it is some kind of a priori truth that robust passage requires a privileged time. I think they are bad because they are not supported by the best argument from experience.

Skow states in the above passage that he does not consider Temporal Disparity to be essential to robust passage. However, he also agrees that from the perspective of a defender of robust passage, it is a serious failing of theories like MST-Time that they do not imply Temporal Disparity (they are ‘bad because in them no single time is privileged’), and are therefore not supported by the Argument from Experience. Indeed, as we saw above, Skow considers the Argument from Experience to be an essential component of the *best case* for robust passage (‘I think that the strongest case in favour of the moving spotlight theory starts with the claim that it explains some features of our experience better than the block universe does’ [p.3]). Given that the Argument from Experience clearly supports theories that imply Temporal Disparity, it is hard to see why Skow would want to deny that Temporal Disparity is essential to robust passage.

We have seen that theories that contain robust passage plausibly imply Temporal Disparity. But there must be more to robust

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<sup>7</sup> I describe this theory in detail in §2.

<sup>8</sup> Although note that Skow briefly describes (§4.4) a version of MST-Time – *MST-Time with Absolute Presentness* – that *does* imply Temporal Disparity. Unfortunately, space does not permit a discussion of that interesting theory here.

passage than Temporal Disparity, because Priorian Presentism also implies Temporal Disparity,<sup>9</sup> and according to Skow, Priorian Presentism does *not* contain robust passage. This is despite the fact that Priorian Presentism *contains robust change* (i.e. implies Propositional Temporalism):

I do not think that the passage of time as characterised by (8) [that time passes iff there is robust change] is particularly robust. (p.34)

Skow's main argument against Priorian Presentism in favour of theories that contain robust passage relies on two premises: first, that theories of time should be consistent with the following thesis:

WHOOSH: Possibly, 'Time passes' is true and always, there is exactly one material thing, an unchanging electron

Second, that Priorian Presentism implies both the Change Thesis (i.e. that there is change over time just in case there are temporary propositions) and the *Passage Thesis* (p.33):

PASSAGE THESIS: Time passes if and only if there is change over time

Given these two premises, Skow's argument against Priorian Presentism is straightforward: given Priorian Presentism, there is a possible situation – call it *Lonely Electron* – in which always, there is exactly one material thing, an unchanging electron. However, given Priorian Presentism there are no temporary propositions in *Lonely Electron*, and therefore (given the Change and Passage theses) 'Time passes' is false.<sup>10</sup> So, Priorian Presentism is inconsistent with Whoosh: it is impossible given Priorian Presentism that 'Time passes' is true and always, there is exactly one material thing, an unchanging electron.

What does this argument tell us about robust passage? Most obviously, that theories containing robust passage should be consistent with Whoosh (p.34):

My argument is that the robust passage of time should be compatible with there being just one material thing, an unchanging electron.

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<sup>9</sup> Many Presentists identify times with *t-propositions*: maximal, consistent, sometimes-true propositions. See e.g. Crisp (2007) and Markosian (2004). On this view, the metaphysical specialness of the present time consists in its being *true*.

<sup>10</sup> What about temporary propositions concerning *events*? According to Skow's Priorian Presentism, there are no events.

But what does it take for a theory to be consistent with Whoosh? A natural answer is that for a theory to be consistent with Whoosh, it must imply that there is a set of permanent, temporally-ordered entities (such as a four-dimensional spacetime manifold). Call this thesis *4D Structure*:

4D STRUCTURE: There is a set of permanent, temporally ordered entities

This answer is supported by Skow's point (pp.39-43) that Priorian Presentists could make their view consistent with Whoosh by accepting the following package of theses: (i) for any event  $e$ , always,  $e$  exists (formally:  $A \forall x (\text{Event}(x) \supset A(\exists y y=x))$ ); (ii)  $x$  is an event iff  $x$  is occurring; (iii) the property of *being an event* is temporary; and (iv) (sometimes-event)  $x$  is *later than* (sometimes-event)  $y$  just in case whenever  $x$  is occurring,  $y$  was occurring. As Skow points out, given this package of theses it would be *true* given Priorian Presentism that there are temporary propositions in Lonely Electron (such as the proposition that the event of the electron's occupying spacetime point  $p$  is occurring), and therefore that 'Time passes' is true. However, Skow rejects the resulting version of Presentism as implausible:

So there is a version of presentism in which time passes even in worlds that are always frozen. I think it is weird enough to ignore, so I will ignore it. (p.43)

We have seen that Skow's arguments against BU and Priorian Presentism plausibly support the hypothesis that a theory  $T$  contains robust passage only if  $T$  implies (i) Temporal Disparity and (ii) 4D Structure. This hypothesis is also supported by the fact that it is consistent with the idea that there could be *degrees of robust passage* (my emphases):

That is a step toward *most robust passage*. (p.35)

And:

I have argued that the conception of passage he [Prior] end up with is not very robust. How might Prior's presentism be modified to contain *more robust passage*? (p.39)

A natural idea is that any theory that implies Temporal Disparity and 4D Structure contains *some* robust passage – but theories such as MST-

Supertense, according to which (i) there is a fundamental property of presentness and (ii) a four-dimensional spacetime manifold, contain robust passage *to the highest degree*.

The hypothesis also helps to explain Skow's characterisation of robust passage as the view that *time itself moves* (p.44):

Of the theories of spatiotemporal reality that philosophers have proposed, the one that comes closest to capturing the idea that time itself moves or "flows" is the moving spotlight theory.

In particular, consider theories that contain robust passage to the highest degree (as characterised above). According to such theories, exactly one time (i.e. hyperplane) is metaphysically distinguished from the rest in virtue of possessing the fundamental property of presentness. Now consider the proposition that a certain time *t* is present. If the proposition that *t* is present is *eternal*, it is *always* true that *t* is present, and time is apparently 'frozen' at a certain moment. So the proposition that *t* is present must be temporary. But if the proposition that *t* is present is temporary, there is a very good sense in which 'time itself moves': that is, presentness is a *temporary* fundamental property of times.

This last point highlights a potential problem with our hypothesis, however: given Temporal Disparity, there is a metaphysically special property *F* possessed by the present time *t* in virtue of which *t* is present. But unless time is 'frozen', the proposition that *t* is *F* must be temporary. So assuming that time is not 'frozen', Temporal Disparity implies that there are temporary propositions.<sup>11</sup> But as we saw above, according to Skow, Propositional Temporalism ('robust change') is *not* essential to robust passage: in particular, Skow counts MST-Time as a theory that contains robust passage (p.67), but MST-Time implies Propositional Eternalism – in Skow's terms, the theory contains 'merely anemic change'. So there is another good reason to think that Temporal Disparity is not after all essential to robust passage.

In a sense we have already dealt with this problem: as we saw above, although Skow counts MST-Time as a theory of robust passage, he also holds that the Argument from Experience is an essential part of the best case for robust passage, and the Argument from Experience does not support MST-Time. So, it seems that given Skow's own case for robust passage, he should *not* count MST-Time as a theory of

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<sup>11</sup> Indeed, given as we saw above that Propositional Temporalism plausibly implies Temporal Disparity, assuming time isn't 'frozen', Temporal Disparity is *equivalent* to Propositional Temporalism.

robust passage – and, as we shall see below in §2, Skow’s *other* main theory of robust passage – MST-Supertense – plausibly *does* imply Propositional Temporalism.

We began with two questions:

(1) What is it for a theory to contain robust passage?

(2) Why does Skow think the failure of BU to contain robust passage provides grounds for rejecting BU?

In answer to (1), I have argued that given Skow’s own arguments in favour of robust passage, we should say that a theory contains robust passage only if it implies (i) Temporal Disparity and (ii) 4D Structure; and that a theory contains robust passage *to the highest degree* only if it implies (i) that presentness is a fundamental property and (ii) that there is a four-dimensional spacetime manifold.

The question is, why does Skow think that theories which posit a fundamental property of presentness and a four-dimensional spacetime manifold - essentially, Moving Spotlight Theories – deliver the most *robust* sense of the passage of time? Here is a hypothesis:<sup>12</sup> Skow thinks that the passage of time is *cheap* given theories like BU and Priorian Presentism in the sense that, given such theories, the truth of the sentence

(3) ‘There are at least two times, one of which is earlier than the other’

entails the truth of the sentence

(4) ‘Time passes’<sup>13</sup>

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<sup>12</sup> Thank you to Cian Dorr for discussion.

<sup>13</sup> For example, consider BU. Given BU, if the sentence ‘There are at least two times, one of which is earlier than the other’ is true, then there are at least two hyperplanes (relative to a frame of reference) one of which is earlier than the other. But given BU, nothing more is required for the truth of the sentence ‘There is change in which time is present’, which is true given BU just in case there are distinct times (i.e. hyperplanes) along the temporal dimension. And if ‘There is change in which time is present’ is true, then ‘Time passes’ is true. Now consider Priorian Presentism. Given Priorian Presentism, if the sentence ‘There are at least two times, one of which is earlier than the other’ is true, then there are at least two maximal, consistent, sometimes-true propositions, one of which is such that whenever it is present (i.e. true) the other *was* present. But given Priorian Presentism, nothing more is required for the truth of the sentence ‘There is change in which time is present’, which is true given Priorian Presentism just in case sometimes, some time (i.e. some maximal, consistent, sometimes-true proposition) is present and some other time was or will be present. And if ‘There is change in which time is present’ is true, then ‘Time passes’ is true.

Whereas in contrast, given theories which posit a fundamental property of presentness and a four-dimensional spacetime manifold, *more* is required in order to secure the truth (4) than the truth of (3) – there also needs to be some true sentence describing change in which time is present (i.e. a sentence such as ‘Some time is present, and some time was or will be present’). Thus, for Skow the *robustness* of the passage of time given theories which ‘contain robust passage to the highest degree’ in his sense consists in the fact that given such theories, it is possible (in some sense) for there to be (temporally ordered) *times* but no *passage of time*.

In answer to (2), we have seen that for Skow, the best argument against BU from robust passage is that BU implies Temporal Parity, and only theories that imply Temporal *Disparity* – which of course includes theories that contain robust passage – can account for certain temporal aspects of our experience.

As it happens, I agree with Skow that those who reject BU should prefer theories that imply that presentness is a fundamental property and that there is a four-dimensional spacetime manifold. However, I disagree that the best reason to reject BU from the perspective of someone who defends such theories is that BU cannot account for certain temporal aspects of our experience. As we saw above, the best reason to reject BU is on the basis of the Argument from Change. (Many of those who reject Lewis’s [1986] *Modal Realism* do so on analogous grounds: i.e. that given Modal Realism, every proposition is if true metaphysically necessarily true; but there is metaphysical contingency just in case some true propositions are metaphysically possibly false; therefore given Modal Realism, there is no metaphysical contingency. See e.g. Williamson 2013, 22-25.) And those who reject BU on the basis of the Argument from Change are not hostage to the fortunes of the Argument from Experience: they can accept Skow’s argument (Chapter 12) that BU is just as well-placed as theories that imply Temporal Disparity to account for the nature of our experience.

The question is, why doesn’t *Skow* think that the Argument from Change is the best argument against BU? The reason, I suspect, is that Skow is a defender of BU, and as mentioned above, it is not clear that there are any arguments for the Change Thesis all of whose premises would be acceptable to one who rejected the thesis – i.e. to a defender of BU. In other words, any reason to accept the Change Thesis is plausibly also a reason to reject BU – and therefore no-one who accepts BU would see any reason for accepting the Change Thesis. So, given that Skow accepts BU, he (naturally) cannot see any

reason to accept the Change Thesis. But of course, that does not mean that the Argument from Change does not provide a good reason to reject BU: it simply means that one is not likely to *accept* that it provides a good reason if one already accepts BU. (Similarly, it is plausible that there are no arguments against scepticism all of whose premises would be acceptable to a thorough-going sceptic. But that does not mean that there are no good arguments against scepticism – it simply means that no thorough-going sceptic is likely to accept that there are any good arguments against scepticism.)

## 2. MST-Supertense

MST-Supertense closely resembles (what I shall call) *Classic MST*, the ‘traditional’ version of MST according to which (i) there is a four-dimensional spacetime manifold; (ii) times are hyperplanes; and (iii) exactly one time possesses the fundamental property of presentness.<sup>14</sup> However, whereas according to Classic MST presentness is the one and only *temporary* fundamental property, according to MST-Supertense, presentness is the one and only *supertemporary* fundamental property. But what is a ‘supertemporary property’? Informally, we can think of a supertemporary property as one that something has at some supertimes and lacks at others, where a *supertime* is a fifth-dimensional analogue of an instant of time – in other words, a maximal four-dimensional ‘slice’ of the five-dimensional universe. However, note that given MST-Supertense, this is merely an informal characterisation of the supertense operators: unlike Skow’s *MST-Supertime* (pp.46-9), MST-Supertense does not imply that there is a concrete five-dimensional universe.

Given a commitment to supertemporary properties, MST-Supertense also implies a commitment to *Propositional Supertemporalism*:

PROPOSITIONAL SUPERTEMPORALISM: Some propositions are supersometimes true and supersometimes false  
(Formally:  $\exists p \text{SS}p \wedge \text{SS}\neg p$ )

For example, according to MST-Supertense the proposition that this time is present is true, but it superalways was and superalways will be false. Moreover, just as MST is often characterised as a *Temporalist*

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<sup>14</sup> See e.g. Deasy (2015), who defends the view, and Sider (2011, 2017), who discusses it.

view<sup>15</sup> – that is, one according to which there are metaphysically fundamental tense operators – MST-Supertense implies *Supertemporalism*, the view that there are metaphysically fundamental *supertense operators* (such as the operator ‘it is supersometimes the case that’). In particular, MST-Supertense utilises supertense operators in its fundamental language in order to secure *superchange* (in the sense of Propositional Supertemporalism) in which time is present. Thus, for example, sentences such as the following plausibly appear in the fundamental language of MST-Supertense (where ‘SF’ is read ‘it superwill be the case that’ and ‘n’ names the present time):

$$(5) \text{Present}(n) \wedge \neg\text{SF}(\text{Present}(n))$$

We have seen that MST-Supertense implies a commitment to Propositional Supertemporalism. But does it imply a commitment to Propositional *Temporalism*? That is, is it true given MST-Supertense that some propositions are sometimes true and sometimes false? In order to answer this question, we need to understand the meanings of the tense operators ‘it was the case that’ (‘P’) and ‘it will be the case that’ (‘F’) given MST-Supertense. Skow (pp. 56-7) describes two ways in which MST-Supertensers can understand the truth-conditions for ordinary tensed sentences. First, suppose there is a certain square – call it ‘Square’ – that bears the superpermanent *black-at* relation to 1992 and 2012 and the superpermanent *white-at* relation to 2022. According to Skow’s ‘weak supertensed truth-conditions’ (WTCs), the sentence

$$(6) \text{Square will be white} \\ (\text{Formally: F(White(Square))})$$

as uttered at some time  $t$  in 2012 is true iff (where ‘ $x>y$ ’ means ‘ $y$  precedes  $x$ ’)

$$(7) \text{SF}(\exists t^*(t^*>t \wedge \text{White}(\text{Square}, t^*)))$$

In contrast, according to the ‘strong supertensed truth-conditions’ (STCs), sentence (6) as uttered at some time  $t$  in 2012 is true iff

$$(8) \text{SF}(\exists t(\text{Present}(t) \wedge \text{White}(\text{Square}, t)))$$

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<sup>15</sup> See e.g. Sider (2011). However, note that both Cameron (2015) and Deasy (2015) defend *non-Temporalist* versions of MST.

The difference between the two approaches is clear: on the WTCs, tense is treated as introducing reference to the time of utterance, whereas on the STCs, tense is treated as introducing quantification over the present time. What is important for our purposes, however, is that on the both approaches, the truth-condition for the standard future tense operator ‘it will be the case that’ (‘F’) is stated in terms of the supertense operator ‘it superwill be the case that’ (‘SF’) – and if the truth-conditions for the standard tense operators are stated in terms of supertense operators given MST-Supertense, the question of whether there are temporary propositions given MST-Supertense comes to the question of whether it is true given MST-Supertense that some propositions are supersometimes true and supersometimes false (i.e. are supertemporary). But we have already seen that given MST-Supertense, some propositions are supertemporary– for example, the proposition that this time is present. It follows that MST-Supertense implies Propositional Temporalism.

According to Skow, there is no good reason to prefer the WTCs to the STCs or vice versa, given that according to MST-Supertense there is superchange in which time is present (p.58). But I think there is a good reason for MST-Supertensers to prefer the STCs. First, notice that (7) above – the WTC for sentence (6) – expresses a *supereternal* proposition: given MST-Supertense, it is superalways the case that  $\exists t^*(t^* > t \wedge \text{White}(\text{Square}, t^*))$ , and therefore it is superalways the case that  $\text{SF}(\exists t^*(t^* > t \wedge \text{White}(\text{Square}, t^*)))$ . In contrast, assuming that Square does not bear the white-at relation to *every* future time, (8) – the STC for (6) – expresses a *supertemporary* proposition: it is supersometimes *not* the case that  $\text{SF}(\exists t(\text{Present}(t) \wedge \text{White}(\text{Square}, t)))$ . Now, suppose that the proposition expressed by a sentence *s* as uttered at a time *t* is just the truth-condition for *s* at *t*. In that case, it follows given the WTCs that ordinary sentences such as (6) express supereternal propositions, whereas given the STCs, such sentences express supertemporary propositions. But as we saw above, given that on MST-Supertense the truth-conditions for the standard tense operators are stated in terms of the supertense operators, it follows that given MST-Supertense, a proposition *p* is supereternal just in case *p* is eternal. Therefore, given the WTCs, ordinary sentences like (6) express eternal propositions, whereas given the STCs, such sentences express temporary propositions. But given that MST-Supertense implies Propositional Temporalism, it would be strange for MST-Supertensers to hold that we never express temporary propositions in ordinary thought and speech. It follows that MST-Supertensers have a reason to prefer the STCs to the WTCs.

Should those who are attracted to MST accept MST-Supertense? One reason not to do so is that MST-Supertense implies a commitment to supertime – and as Skow points out, a commitment to supertime is ‘crazy’ *and* ‘just insane’ (p.47):

Now the idea that there is such a thing as supertime is crazy. It is just insane.

Of course, according to Skow, MST-Supertense does *not* imply a commitment to supertime (p.52):

One way to do without supertime is to do to supertime what presentism does to time. The role talk of time plays in the block universe theory is played in (Priorian) presentism by tense operators. Let the role talk of supertime plays in MST-Supertense be played in the new theory [MST-Supertense] by “super” tense operators.

(‘MST-Supertense’ is a Propositional Superpermanentist theory according to which reality contains a five-dimensional block universe, slices through which along the fifth dimension are indiscernible with respect to all fundamental properties other than the superpermanent property of presentness.) Skow argues that MST-Supertense ‘does without supertime’ in the same way that Presentism ‘does without time’. But does Presentism *really* ‘do without time’?

There is a sense in which Presentism does without time: many (but not all – see Zimmerman 2011) Presentists reject the existence of the spacetime manifold. However, there is also a good sense in which Presentism implies that *there is* time: Presentism as standardly conceived implies both Temporalism and Propositional Temporalism, and any theory that implies that there are fundamental tense operators and change over time (in the sense of Propositional Temporalism) is plausibly a theory committed to the reality of time. Moreover, given Propositional Temporalism, Presentism implies that there are *t-propositions*: maximal, consistent, sometimes-true propositions. And *t-propositions* are very good candidates for the ‘instant of time’ role.

Similarly, although MST-Supertensers reject the existence of a concrete five-dimensional manifold, MST-Supertense implies both Supertemporalism – the view that there are fundamental supertense operators – and Propositional Supertemporalism. And any theory that implies that there are fundamental supertense operators and superchange (in the sense of Propositional Supertemporalism) is plausibly a theory committed to the reality of supertime. Moreover, given Propositional Supertemporalism, MST-Supertense implies that there are *s-propositions*: maximal, consistent, supersometimes-true propositions. And *s-propositions* are very good candidates for the

‘superinstant of time’ role. Therefore, it is hard to see how Skow can avoid the conclusion that MST-Supertense is (at least somewhat) ‘crazy’ and ‘insane’.

The question is, why does Skow defend MST-Supertense rather than the structurally-similar Classic MST? In other words, why not simply let ‘tense’ play the role of ‘supertense’ in MST? It may be that Skow is motivated by something like the following argument:

If tense played the role of supertense in MST, then MST would imply that there both fundamental tense operators – which are required in order to secure change in which instant is present – and a fundamental *precedence* relation between times (i.e. hyperplanes). But any theory according to which there are both fundamental tense operators *and* a fundamental precedence relation is a theory according to which there are (in some sense) *two dimensions of time* – and there cannot be two dimensions of time. So tense cannot play the role of supertense in MST.

The problem with this argument is that the first premise is false. There are at least two ways MSTers can avoid the ‘two time-dimensions’ worry without resorting to primitive supertense. One option is to analyse the precedence relation in terms of tense operators and ‘is present’, as follows:

$$\text{PRECEDENCE: } \forall t \forall t^* (\text{Precedes}(t, t^*) \quad := \quad A(\text{Present}(t) \quad \supset \quad F(\text{Present}(t^*))))^{16}$$

On this view, what it is for a time  $t$  to precede another time  $t^*$  is for it to be the case that whenever  $t$  is present,  $t^*$  *will be* present. A Classic MSTer who adopted this analysis of the precedence relation would not be subject to the ‘two time-dimensions’ objection. The second option is to retain a primitive precedence relation between times, but provide some analysis of the tense operators. For example, Deasy (2015) defends a version of Classic MST on which the tense operators ‘P’ (‘it was the case that’) and ‘F’ (‘it will be the case that’) are analysed as follows:<sup>17</sup>

$$\text{WAS: } P\varphi \quad := \quad \exists t \exists t^* (\text{Present}(t) \wedge \text{Precedes}(t^*, t) \wedge \text{at } t^*, \varphi)$$

$$\text{WILL: } F\varphi \quad := \quad \exists t \exists t^* (\text{Present}(t) \wedge \text{Precedes}(t, t^*) \wedge \text{at } t^*, \varphi)$$

<sup>16</sup> ‘ $\varphi := \psi$ ’ is read ‘for it to be the case that  $\varphi$  is for it to be the case that  $\psi$ ’.

<sup>17</sup> This is essentially McTaggart’s (1927, §329) analysis of the tense operators.

Of course, given that Propositional Temporalists typically analyse the operator ‘at (time) t’ using the tense operator ‘always’ (so that ‘At t,  $\varphi$ ’ is equivalent to ‘A(Present(t)  $\supset \varphi$ )’), Classic MSTers who wish to eliminate tense operators from their fundamental language must supplement the above analyses with an operator-free analysis of ‘at t’. But there are ways to do this: for example, one option is to follow Parsons (2002) and provide a *counterfactual analysis* of ‘at t’, so that ‘At t,  $\varphi$ ’ is equivalent to ‘If t were present, it would be the case that  $\varphi$ ’.<sup>18</sup> Similarly, Cameron (2015) defends a version of MST according to which there is a fundamental precedence relation but no metaphysically fundamental tense operators. However, in contrast to Deasy’s (2015) Classic MST, according to Cameron’s MST there is no fundamental property of presentness: rather, there are many temporary fundamental ‘age properties’, and sentences concerning how things *were* or *will be* are made true by propositions concerning temporary states of affairs of particular things having certain locations, ages and (permanent) ‘temporal distributional properties’.

Unfortunately, space does not permit an assessment here of which of the above options MSTers should prefer. However, either of the above options seem preferable to the strategy of positing primitive supertense and endorsing Propositional Supertemporalism; especially if doing so can reasonably be taken to imply a commitment to the reality of supertime.

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<sup>18</sup> Deasy (2015) defends an alternative, non-modal ‘substitutional analysis’ of ‘at t’.

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