

# The moving spotlight theory

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**Abstract** The aim of this paper is to describe and defend the moving spotlight theory of time. I characterise the moving spotlight theory as the conjunction of two theses: permanentism, the thesis that everything exists forever, and the A-theory, the thesis that there is an absolute, objective present time. I begin in Sect. 2 by clearing up some common misconceptions about the moving spotlight theory, focusing on the discussion of the theory in Sider (Writing the book of the world, Oxford University Press, Oxford, 2011). In doing so, I also fill-out the barebones picture of the moving spotlight theory as the conjunction of permanentism and the A-theory. In Sect. 3 I show how moving spotlights can avoid the two common objections to their view, the McTaggartian argument that the view is contradictory, and the epistemic argument that the view implies that we should believe we are not located at the present moment. I conclude that the moving spotlight theory does not deserve its current relative unpopularity.

**Keywords** Metaphysics · Time · The A-theory of time · The moving spotlight theory · McTaggart's argument

## 1 Introduction

Consider the following four theses:

A-THEORY: Some instant of time is absolutely, non-relatively present

B-THEORY: No instant of time is absolutely, non-relatively present

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**PERMANENTISM:** It is always the case that everything exists eternally (formally:  $\mathbf{A}\forall x\mathbf{A}\exists y y = x$ )<sup>1</sup>

**TRANSIENTISM:** Sometimes something begins to exist, and sometimes something ceases to exist (formally:  $\mathbf{S}(\exists x\mathbf{P} \neg \exists y y = x) \ \& \ \mathbf{S}(\exists x\mathbf{F} \neg \exists y y = x)$ )

A few explanatory remarks: first, note that the predicate ‘is present’ in the definitions of the A- and B-theories is intended to be read as expressing a *temporary property*—that is, a property that is gained or lost over time—rather than a *permanent property*, such as the property of being identical to now. Second, it is supposed to be consistent with the A-theory that presentness is not itself a fundamental property, but rather reduces to or supervenes on the fundamental. (What it is for an instant to be present according to a particular version of the A-theory will depend on what sort of things play the *instant* role according to that theory; for example, if instants are maximal, consistent propositions as per Crisp (2007), then the present instant is just the *true* instant.) Third, although A- and B-theorists disagree about whether some instant is *absolutely* present, they agree that every instant is present *relative to itself*:

**RELATIVITY:** Every instant  $t$  is such that, at  $t$ ,  $t$  is present

Relativity seems obviously true: from the perspective of any given instant, *that* instant is the present instant (even it is in fact past or future), just as from the perspective of any given story, *that* story is true (even if it is in fact false). Finally, although transientism is consistent with the strange thesis that throughout all time exactly one thing begins to exist and exactly one thing ceases to exist (perhaps the very same thing), in practice most transientists (such as Prior 1968) hold that there were and will be *many* things that are now nothing—in particular, events such as wars and weddings, and medium-sized material objects such as cats, cars, people (or people’s bodies) and geographical features. The two most popular views in the philosophy of time are *four-dimensionalism* (sometimes just called *the B-theory*) and *presentism*.<sup>2</sup> Four-dimensionalism combines the B-theory and permanentism, and presentism combines the A-theory and transientism<sup>3</sup>:

**FOUR-DIMENSIONALISM:** No instant of time is absolutely, non-relatively present (B-THEORY) and it is always the case that everything exists eternally (PERMANENTISM)<sup>4</sup>

<sup>1</sup> The name ‘permanentism’ for this thesis is due to Williamson (2013, p. 4).

<sup>2</sup> Four-dimensionalists include Mellor (1998), Sider (2001), and Smart (1987). Presentists include Bigelow (1996), Crisp (2003), Markosian (2004), Prior (1968), and Zimmerman (2008).

<sup>3</sup> This is not the standard way of defining theories of time. Typically, theories are defined in terms of the A- and B-theories and how they answer the following pair of questions: Are there past things? Are there future things? Four-dimensionalists answer ‘yes’ and ‘yes’ to these questions, whereas presentists answer ‘no’ and ‘no’. The problem with this way of defining theories of time is that it is hard to say what it is for something to be ‘past’ or ‘future’ in the relevant sense, as the predicates are supposed to apply to objects and events as well as instants.

<sup>4</sup> Arguably, the B-theory entails permanentism: if the B-theory is true then every proposition is permanent (either always true or always false), and if every proposition is permanent then in particular all the ontological facts are permanent, in which case everything exists eternally.

**PRESENTISM:** Some instant of time is absolutely, non-relatively present (A-THEORY) and sometimes something begins to exist, and sometimes something ceases to exist (TRANSIENTISM)<sup>5,6</sup>

A much less popular view—the *moving spotlight theory*—combines the A-theory and permanentism<sup>7</sup>:

**MOVING SPOTLIGHT THEORY:** Some instant of time is absolutely, non-relatively present (A-THEORY) and it is always the case that everything exists eternally (PERMANENTISM)

The moving spotlight theory takes its evocative name from an influential early description of the view by Broad (1923, pp. 59–60):

We are naturally tempted to regard the history of the world as existing eternally in a certain order of events. Along this, and in a fixed direction, we imagine the characteristic of presentness as moving, somewhat like the spot of light from a policeman's bull's-eye traversing the fronts of the houses in a street. What is illuminated is the present, what has been illuminated is the past, and what has not yet been illuminated is the future (Broad 1923, p. 59).

Why is the moving spotlight theory so much less popular than four-dimensionalism or presentism? Prima facie, the combination of the A-theory and permanentism is no less theoretically stable than the combination of the B-theory and permanentism, or the A-theory and transientism. One plausible reason is that the moving spotlight theory is persistently misconceived. For example, Sider (2011) describes the theory as one according to which ordinary sentences express *permanent propositions* (propositions that are either always true or always false) except when they 'concern' absolute presentness. However, this makes the moving spotlight theory look like an unattractive half-way house between four-dimensionalism and non-permanentist A-theories such as presentism. If that is how the view is usually conceived then it is no wonder it is so unpopular.

Another reason is that the moving spotlight theory is supposed to be subject to some serious objections. In other words, the combination of the A-theory and permanentism *is* thought to be theoretically unstable in a way that the combination of the A-theory and transientism and the combination of the B-theory and permanentism are not. There are two common objections to the moving spotlight

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<sup>5</sup> Of course, most presentists are transientists according to whom *many* things begin and cease to exist over time. One could try to refine this definition so that A-theories according to which e.g. just one thing begins and ceases to exist over time do not count as presentist theories; however, I think this project is doomed to failure.

<sup>6</sup> Arguably, transientism entails the A-theory (contra Cappelen and Hawthorne 2009, p. 96): if there is change over time in what there is, there are temporary ontological facts and therefore temporary propositions, and if there are temporary propositions then there is an *accurate* instant (where an instant *t* is accurate iff for all propositions *P*, *P* is true at *t* iff *P* is true simpliciter; see Dorr Unpublished MS, *Counterparts*). However, arguably, an instant *t* is accurate iff *t* is absolutely present.

<sup>7</sup> For recent (sympathetic) discussions of the moving spotlight theory see Skow (2009) and Sullivan (2012).

theory: the ‘McTaggartian’ argument that the view is contradictory, and the ‘epistemic’ argument that the view implies that we should believe that we are not now located at the present instant. The McTaggartian argument is inspired by McTaggart’s (1908, 1927) argument that the A-theory implies that every event is (wholly) past, present and future, and is therefore contradictory. Although many theorists now view McTaggart’s original argument as a decisive failure (see e.g. Sider 2001, p. 35, n. 19), some hold that the argument—or at least, some argument in the spirit of it—can be used to show that the moving spotlight theory (if not the A-theory) implies that every event/instant/object is wholly past, present and future, and is therefore contradictory.<sup>8</sup> The epistemic argument, on the other hand, was first raised against the *growing block theory* (see Braddon-Mitchell 2004), which like the moving spotlight theory combines the A-theory with non-transientism—in this case, the thesis that things begin but never cease to exist over time. However, the argument has more recently been directed against the moving spotlight theory (see Sider 2011).

The main aim of this paper is to describe and defend the moving spotlight theory. I begin in Sect. 2 by clearing up some of the common misconceptions about the theory mentioned above, focusing on the discussion of the theory in Sider (2011). This also serves to fill-out the barebones picture of the moving spotlight theory as the conjunction of permanentism and the A-theory. In Sect. 3, I show how moving spotlighters can avoid the two common objections to their view. I conclude that the moving spotlight theory does not deserve its relative unpopularity.

## 2 Misconceptions

Some good examples of how the moving spotlight theory is typically misconceived can be found in Sider (2011). One complication, however, is that Sider distinguishes two versions of the moving spotlight theory: ‘Williamsonian passage’ (so-called because it is inspired by Williamson’s (2002, 2013) theory of modality) and ‘the spotlight theory’.<sup>9</sup> From now on, in order to avoid confusion I refer to Sider’s ‘spotlight theory’ as *classic MST*, as I believe this is the version of the moving spotlight theory that most people identify with the name ‘the moving spotlight theory’. How do we distinguish classic MST and Williamsonian passage? Suppose one is a permanentist A-theorist. Now consider: spacetime physics provides a picture of the world as a four-dimensional manifold of spacetime points, with a permanent stock of objects and events standing in permanent fundamental relations and bearing permanent fundamental properties. Given the success to date of physics, one should take this picture very seriously. However, if one is an A-theorist, one

<sup>8</sup> For example, see Bourne (2006), Smith (2010), Deng (2012), and Parsons (2002). Note that Parsons argues that moving spotlighters can avoid the McTaggartian argument by adopting a counterfactual theory of tense.

<sup>9</sup> Similarly, Brogaard and Marlow (2013, p. 636) distinguish ‘passage’ and ‘the moving spotlight theory’. It seems clear from what they say that both theories are permanentist A-theories, and therefore versions of the moving spotlight theory.

also knows that there is at least one temporary property: the instantaneous property of presentness, instantiated by successive moments of time. One knows, therefore, that there is at least one *fundamental* temporary property—for given permanentism, if all fundamental properties were permanent, all properties would be permanent.<sup>10</sup> The question is: *how many* fundamental properties are temporary? Of course, there is a multitude of possible answers, ranging from ‘just one’ to ‘all of them’. Classic MST can be defined as the version of the moving spotlight theory according to which there is exactly one temporary fundamental property, namely, the temporary fundamental property of presentness:

CLASSIC MST: THE MOVING SPOTLIGHT THEORY & there is exactly one temporary fundamental property<sup>11</sup>

Williamsonian passage, on the other hand, can be defined as the version of the moving spotlight theory according to which *many* (perhaps most, perhaps all) fundamental properties are temporary:

WILLIAMSONIAN PASSAGE: THE MOVING SPOTLIGHT THEORY & there are many temporary fundamental properties

Thus the distinctive central claim of Williamsonian passage is that, in addition to the permanent fundamental relations posited by physicists, there are numerous other temporary fundamental properties. For example, a Williamsonian might say that, if there is a permanent fundamental relation of *having mass at* (or *having mass n at*) which objects bear to instants, there is also a temporary fundamental property of *having mass simpliciter* (or *having mass n simpliciter*).

Sider’s misconceptions about the moving spotlight theory primarily concern classic MST. Here is Sider’s (2011, p. 259) initial description of classic MST:

The defender of the spotlight theory also embraces past and future objects, but she accepts a “fuller” conception of these objects than the Williamsonian. According to her, these objects have all the features that the spatializer [B-theorist] thinks they have. We can put this by saying that the spotlight theorist joins the spatializer in accepting the block universe. But the spotlight theorist accepts something in addition: a joint-carving monadic property of presentness... which is possessed by just one moment of time, and which “moves”, to be possessed by later and later times, as time passes. This motion... amounts to tensed facts about which moment of time possesses this property.

Sider provides a relatively accurate basic characterisation of classic MST. As we saw above, classic MSTers hold that in addition to the permanent fundamental properties and relations posited by physicists, there is exactly one temporary fundamental property (absolute presentness). In that sense, Sider is right to state that

<sup>10</sup> I assume that all properties supervene on the fundamental properties.

<sup>11</sup> Strictly, classic MSTers don’t have to hold that the one and only temporary fundamental property is the property of absolute presentness. For example, suppose one wants to eliminate instants of time from one’s ontology in favour of events. In that case, one could be a classic MSTer according to whom the only temporary fundamental property is the property of *occurring*, or *taking place*, simpliciter.

classic MSTers ‘embrace past and future objects’ which ‘have all the [fundamental] features that the spatializer thinks they have.’ For example, classic MSTers and B-theorists agree that dinosaurs and Mars bases exist and are located at past and future instants respectively, and bear permanent relational properties such as *being a dinosaur at a past instant* and *being a Mars base at a future instant*. Moreover, classic MSTers agree with Sider that the ‘movement’ of presentness through the spacetime manifold ‘amounts to tensed facts about which moment of time possesses this property’, if that means that sentences such as

- (1) Presento is absolutely present<sup>12</sup>

express *temporary propositions*:

TEMPORARY PROPOSITION: Proposition  $p$  is temporary iff ( $p$  is true simpliciter  $\supset p$  was or will be false simpliciter) & ( $p$  is false simpliciter  $\supset p$  was or will be true simpliciter)

So far, so good. However, what does Sider mean when he says that classic MSTers ‘accept a “fuller” conception of these [i.e. past and future] objects than the Williamsonian’? Further quotations reveal that Sider goes on to build a peculiar theory from the basic components of classic MST:

She [the classic MSTer] accepts that there exist dinosaurs located before 2011; but this is the spatializer’s proposed truth-condition for an utterance in 2011 of ‘There were dinosaurs.’ More generally, the spotlight theorist can accept the spatializer’s reduction of tense for all tensed statements except those concerning presentness. (Sider 2011, p. 260)

[According to classic MST] there is genuine change in which moment is present. But notice that the spotlight theorist does not admit genuine change for anything else! For her there is no genuine change in whether I am sitting, or in whether there are dinosaurs, or whether a war is occurring, since her account of these matters is identical to the spatializer’s. (Sider 2011, p. 260)

Sider seems to think that it follows from the classic MSTer’s thesis that there is just one temporary fundamental property of presentness that ordinary predicates such as ‘is sitting’ express permanent properties and ordinary sentences such as ‘Dan is sitting’ express permanent propositions (‘*there is no genuine change in whether I am sitting...* since her account of these matters is identical to the spatializer’s’). However, that is not the case: in fact, it follows from a commitment to temporary fundamental presentness that ordinary predicates such as ‘is sitting’ express temporary properties and ordinary sentences such as ‘Dan is sitting’ express temporary propositions. For if there is a temporary fundamental property of presentness, there are temporary relational properties of e.g. *sitting at a present instant* and temporary propositions such as the proposition *that Dan is sitting at a present instant*. But it would be very strange for an

<sup>12</sup> ‘Presento’ names the instant it is now.

A-theorist to hold that ordinary predicates such as ‘is sitting’ and ordinary sentences such as ‘Dan is sitting’ express permanent contents rather than such temporary contents. Why? For one thing, to do so would be to unnecessarily concede a great deal to B-theorists, according to whom all thought and speech expresses permanent contents (such as the proposition *that Dan is sitting at some instant*, or *that there is an instantaneous temporal part of Dan that is sitting simpliciter*). Having rejected the B-theory, it would be very strange for an A-theorist to make such a concession. Moreover, it would raise all sorts of difficult questions concerning why we don’t express temporary contents in ordinary thought and speech. After all, it must be at least *possible* to express temporary contents, such as when I say ‘Dan is sitting at the present instant’. But if I can easily express temporary contents in the context of doing metaphysics then why not in ordinary thought and speech?

Contra Sider, according to classic MST there *is* genuine change in whether he is sitting, as the sentence ‘Sider is sitting’ expresses the temporary proposition that Sider is sitting at a present instant (which is true simpliciter when fundamental presentness is instantiated by instants to which Sider bears the permanent *sitting-at* relation, and false otherwise). More generally, moving spotlights, like all A-theorists, should hold that many ordinary predicates express temporary properties and many ordinary sentences express temporary propositions.

Sider’s second mistake is to think that classic MSTers must hold that there are fundamental temporal operators (‘primitive tense operators’). He writes

The spotlight theorist can accept the spatializer’s reduction of tense for all tensed statements except those concerning presentness. (Sider 2011, p. 260)

The spotlight theorist [i.e. classic MSTer] accepts primitive tense operators... Using the tense operators, the spotlight theorist can describe the change in which moment has the property of presentness... Describing this change... is in fact the only purpose of the tense operators in the spotlight theory. (Sider 2011, pp. 259–260)

There are two points here. First, Sider thinks that classic MSTers ‘accept the spatializer’s reduction of tense’ for all tensed sentences except for those which ‘concern’ presentness. Second, he thinks that classic MSTers require fundamental temporal operators in order to ‘describe the change in which moment has the property of presentness’. Let us address each of these points.

There are a number of ways of interpreting the first point. If to accept the spatializer’s reduction of tense for all tensed sentences except for those which ‘concern’ presentness is to hold that sentences which do not have ‘is present’ in their most perspicuous metaphysical truth-conditions express permanent propositions (such as *that Dan is sitting at 3 pm on 3rd May 2014*), then Sider is correct. Indeed, in that case Sider makes an important point concerning classic MST: that is, that the property of fundamental presentness plays an extremely important metaphysical-semantic role for classic MSTers. For according to classic MST, any sentence that does not concern presentness (in the sense of having ‘is present’ in its most perspicuous metaphysical truth-conditions) expresses a permanent proposition. It just so happens that many of our ordinary tensed sentences *do* (covertly) concern

presentness. In that sense, for classic MSTers the temporariness of presentness is the ground of all temporariness: it is the fundamental source of time and change.

On the other hand, if to accept the spatializer's reduction of tense for all tensed sentences except for those which 'concern' presentness is to hold that all tensed sentences except those which contain the extraordinary predicate 'is present' express permanent propositions, then Sider is obviously mistaken: we have already seen that classic MSTers (like all A-theorists) should hold that many ordinary tensed sentences express temporary propositions.

Finally, if to accept the spatializer's reduction of tense for all tensed sentences except for those which 'concern' presentness is to hold that all tensed sentences except those which contain the predicate 'is present' can be assigned temporal operator-free truth-conditions, then again Sider is correct. In fact, the classic MSTer's view that there is exactly one temporary fundamental property of presentness fits very naturally with *operator reductionism*, the thesis that there are *no* fundamental temporal operators (so that all sentences, *whether or not they contain 'is present'*, can be assigned temporal-operator-free truth-conditions). For example, we saw above that classic MSTers interpret ordinary predicates as expressing temporary relational properties defined in terms of presentness, so that (for example) the sentence

(2) **P**(Dan is sitting)

is analysed as

(3) **P**( $\exists t(t$  is present &  $R(\text{Dan}, t)$ ))

Informally: it was the case that Dan bears the permanent sitting-at relation to the present instant. Now suppose that classic MSTers are operator reductionists according to whom the P- and F-principles are not merely true biconditionals but express *metaphysical analyses* of their left-hand-sides:

P-PRINCIPLE: It was the case that  $\phi$  iff at some instant  $t$  earlier than the present instant,  $\phi$

F-PRINCIPLE: It will be the case that  $\phi$  iff at some instant  $t$  later than the present instant,  $\phi$ <sup>13</sup>

In that case, (3) reduces to the fact that

(4)  $\exists t^* \exists t^{**} (t^*$  is present &  $t^{**}$  is earlier than  $t^*$  & at  $t^{**} (\exists t(t$  is present &  $R(\text{Dan}, t)))$ )

Informally: there is an instant  $t$  earlier than the present and at  $t$ , Dan bears the permanent sitting-at relation to a present instant. Of course, (4) contains the operator 'at  $t$ ', and according to one natural A-theoretic analysis of 'at  $t$ ', 'at  $t$ ,  $\phi$ ' just means that whenever  $t$  is present,  $\phi$ :

AT-T: At instant  $t$ ,  $\phi$  iff **A**( $t$  is present  $\supset \phi$ )

<sup>13</sup> Or, even better: it will be that  $\phi$  iff at some instant  $t$  such that the present is earlier than  $t$ ,  $\phi$ .



Given that this account analyses ‘at  $t$ ’ in terms of temporal operators, it is not available to operator reductionist classic MSTers. However, there is an attractive operator reductionist analysis which is open to classic MSTers: namely, that ‘at  $t$ ’ functions to replace all occurrences of ‘is (absolutely) present’ in the relevant sentence with ‘is identical with  $t$ ’. Call this the *substitutional analysis* of ‘at  $t$ ’.

To see how the substitutional analysis works, suppose  $\varphi$  is a sentence free of temporal operators and ‘at  $t$ ’, in which the only formulae that attribute temporary properties are formulae of the form ‘ $x$  is present’. Then ‘at  $t$ ,  $\varphi$ ’ is analysed by  $\varphi^*$ , where  $\varphi^*$  is the sentence like  $\varphi$  except that every formula of the form ‘ $x$  is present’ is replaced by ‘ $x = t$ ’. For example, given the substitutional analysis (3) reduces to

$$(5) \exists t^* \exists t^{**} (t^* \text{ is present} \ \& \ t^{**} \text{ is earlier than } t^* \ \& \ \exists t (t = t^{**} \ \& \ R(\text{Dan}, t)))$$

Informally: Dan bears permanent relation  $R$  to some past time. On this account, to analyse a sentence of the form ‘at  $t$ ,  $\varphi$ ’ in general, one first needs to provide a metaphysical analysis of  $\varphi$  that reduces away all the temporary properties until the only one left is presentness.

The substitutional analysis of ‘at  $t$ ’ was introduced above as the thesis that ‘at  $t$ ’ functions to replace all occurrences of ‘is (absolutely) present’ in the relevant sentence with ‘is identical with  $t$ ’. While this characterisation suffices to provide an informal introduction to the analysis, it is useful to provide a more formal characterisation by defining the effect of the ‘at  $t$ ’ operator on an arbitrary sentence  $A$  of a specified language including the operator inductively on the complexity of  $A$ . The relevant language,  $L$ , is standard first-order quantificational logic with identity, and with the predicates ‘ $<$ ’ (read ‘is earlier than’) and ‘is (absolutely) present’, the ‘at  $t$ ’ operator, and instant variables  $t, u, v, \dots$   $\$$  is a mapping from sentences of  $L$ ,  $\$A$ , etc. is a family of auxiliary mappings (one for each temporal term  $t$ ) from sentences of  $L$ , and  $A$  is an arbitrary sentence of  $L$ . We can then formally define the effect of ‘at  $t$ ’ as follows:

- $\$A =_{df} A$  if  $A$  is atomic
- $\$_t(v \text{ is present}) =_{df} v = t$
- $\$_t(A) =_{df} A$  for all other atomic sentences  $A$
- $\$\neg A =_{df} \neg \$A$
- $\$_t \neg A =_{df} \neg \$_t A$
- $\$(A \ \& \ B) =_{df} \$A \ \& \ \$B$
- $\$_t(A \ \& \ B) =_{df} \$_t A \ \& \ \$_t B$
- $\$\exists v A =_{df} \exists v \$A$
- $\$_t \exists v A =_{df} \exists v \$_t A$
- $\$(at \ t^* \ A) =_{df} \$_{t^*} A$
- $\$_t(at \ t^* \ A) =_{df} \$_{t^*} A$  (where  $t^*$  may but need not be a different term from  $t$ )

It is clear from the above that  $\$$  maps all formulas of  $L$ -including those with complex embeddings of ‘at  $t$ ’- to ‘at  $t$ ’-free formulas in the intended way.

There are a few points to note concerning the substitutional analysis. First, on the substitutional analysis ‘At  $t(t \text{ is present})$ ’ reduces to ‘ $t = t$ ’. Therefore on this analysis the thesis that every instant is present relative to itself is trivial: for an

instant  $t$  to be present relative to itself is just for  $t$  to be self-identical. Second, consider how the classic MSTer interprets the thesis of permanentism given the substitutional analysis. Permanentism is the thesis that always, everything always exists. Given the A-principle ( $\mathbf{A}\phi$  iff  $\forall t$  at  $t(\phi)$ ), this reduces to

$$(6) \quad \forall t \text{ at } t(\forall x (\forall t \text{ at } t(\exists y y = x)))$$

which given the substitutional analysis reduces to

$$(7) \quad \forall t(\forall x (\forall t(\exists y y = x)))$$

in which the ' $\forall t$ 's are redundant, and which is therefore equivalent to

$$(8) \quad \forall x (\exists y y = x)$$

In other words, given the substitutional analysis, permanentism is equivalent to the trivial truth that everything exists. This makes good sense if we remember that given operator reductionist classic MST, the temporal operators are sensitive to the predicate 'is present', and there is no 'is present' in the thesis of permanentism. Finally, some might worry that the substitutional analysis is circular, as the informal description of the analysis mentions temporary properties ('in which the only formulae that attribute *temporary properties* are formulae of the form ' $x$  is present'), which given operator reductionism are analysed in terms of 'at  $t$ '. However, this is not a genuine concern. The substitutional analyses of *particular* sentences of the form 'at  $t$ ,  $\phi$ ' do not contain the phrase 'temporary properties'. For example, according to the substitutional analysis the sentence 'At  $t$ ,  $t^*$  is present' is simply analysed as ' $t^* = t$ ', and the sentence 'At  $t$ ,  $t^*$  is a billion years after the start of the universe' is analysed as ' $t^*$  is a billion years after the start of the universe'. The phrase 'temporary properties' is merely used in an attempt to help others to understand *in a general way* which sentence-level analyses the substitutional analyst is committed to; and one can use any expressive resources one wishes in such attempts. Let us now turn to Sider's second point. We have seen that classic MST is perfectly consistent with operator reductionism. However, according to Sider classic MSTers *cannot* endorse operator reductionism, as they require fundamental temporal operators in order to 'describe the change in which moment has the property of presentness':

"1776 once had presentness" cannot be analyzed as saying that 1776 has the property of presentness relative to itself, since presentness is a monadic property, and is not had relative to anything. 2011 has presentness simpliciter; nothing else has presentness; there are no other non-tensed facts about presentness; hence we cannot analyze the tensed claim that "1776 once had presentness" in nontensed terms.' (Sider 2011, p. 260)

When Sider states that 'there are no non-tensed facts about presentness', what he seems to mean is that tensed sentences containing the predicate 'is present' cannot be subject to operator-reductionist analyses. To see why Sider is wrong, let us focus on the sentence

(9) 1776 was once present

If Sider is correct, (9) cannot be subject to an operator-reductionist analysis. However, according to the operator reductionist classic MSTer, the truth of (9) reduces to

(10)  $\exists t^* \exists t^{**} (t^* \text{ is present \& } t^{**} \text{ is earlier than } t^* \text{ \& at } t^{**} (\exists t (t \text{ is present \& } t = 1776)))$

Given the substitutional analysis of ‘at  $t$ ’, according to which (informally) ‘at  $t$ ’ functions to replace all occurrences of ‘is (absolutely) present’ in the relevant sentence with ‘is identical with  $t$ ’, (10) reduces to

(11)  $\exists t^* \exists t^{**} (t^* \text{ is present \& } t^{**} \text{ is earlier than } t^* \text{ \& } \exists t (t = t^{**} \text{ \& } t = 1776))$

Informally: some instant earlier than the present instant is identical with 1776, or in other words, 1776 is earlier than the present. But this is an operator-reductionist analysis of (9); therefore tensed sentences containing the predicate ‘is present’ can, after all, be subject to operator-reductionist analyses. Classic MSTers do not *have* to be operator reductionists: the theory is consistent with *operator fundamentalism*, the thesis that there are fundamental temporal operators. However, the point to note is that Sider is wrong to suggest that classic MSTers cannot endorse operator reductionism, just as he is wrong to suggest that classic MSTers must hold that ordinary predicates express permanent properties and ordinary sentences express permanent propositions.

### 3 Objections

As mentioned above, there are two common objections to the moving spotlight theory: the McTaggartian argument that the theory is contradictory, and the ‘epistemic’ argument that given the moving spotlight theory, we should believe that we are not now located at the present instant. Let us now consider these arguments in detail.

#### 3.1 McTaggartian arguments

Two recent McTaggartian arguments against the moving spotlight theory are due to Bourne (2006) and Smith (2010).<sup>14</sup> Bourne argues as follows:

Suppose, for instance, we get someone to admit that there is a time that will become present. We then ask when that time will become present. The answer is: in the future (or, if you like, later than the present). But this concedes that there is a time in the future that is present (and so *mutadis mutandis* for all

<sup>14</sup> Bourne (2006) is explicit that his argument is directed against the moving spotlight theory; Smith’s (2010) argument is directed against ‘the A-theory’, although it seems clear that the version of the A-theory he has in mind is permanentist.

other locations in time). But a time cannot be both present and future. Thus we have a contradiction. (Bourne 2006, p. 75)

It is easy to see where this argument goes wrong. To make things clear, let us set out the argument in more formal terms. Suppose 'Futuro' names a future instant (e.g. some instant in 2066). Then the argument is as follows:

- (1)  $F$ (Futuro is present)
- (2) At some instant  $t$  later than the present instant, Futuro is present
- (3) Futuro is present

Premise (1) is true: Futuro is a future instant, and (1) says truly of it that it will be present. Premise (2) applies the F-principle to (1):

F-PRINCIPLE: It will be the case that  $\varphi$  iff at some instant  $t$  later than the present instant,  $\varphi$

This is the answer to the question: when will Futuro be present? (3) is the conclusion, that Futuro is present, which leads to a contradiction given that Futuro is future (by stipulation): nothing can be both (wholly) present and (wholly) future. The problem with this argument is that (3) does not follow from (2). According to (2), Futuro is present at a future instant  $t$ ;  $t$  is, of course, Futuro itself, as every instant is present at, and only at, itself. However, it does not follow from the fact that Futuro is present relative to itself that it is present, just as it does not follow from the fact that at some future instant I am sleeping that I am sleeping, or from the fact that at some past instant Caesar is crossing the Rubicon that Caesar is crossing the Rubicon. Bourne provides no reason at all why moving spotlights (whether they are classic MSTers or Williamsonians) should accept the transition from premise (2) to premise (3).

Why doesn't the fact that Futuro is present at Futuro imply that Futuro is present simpliciter? As we saw above, on one natural A-theoretic analysis of 'at  $t$ ',  $\varphi$  is the case at instant  $t$  iff it is always the case that  $t$ 's being absolutely present implies  $\varphi$ :

AT-T: At instant  $t$ ,  $\varphi$  iff  $A(t \text{ is present} \supset \varphi)$ <sup>15</sup>

Given this analysis, the relativity of presentness is trivial: for an instant  $t$  to be present relative to itself is just for it to be the case that always,  $t$ 's being present implies  $t$ 's being present. But the trivial fact that whenever Futuro is present, Futuro is present in no way implies that Futuro is present, just as the trivial fact that whenever I am King of France, I am King of France in no way implies that I am King of France. The only way to reach the conclusion that Futuro is present is to add the premise that Futuro is present; but that is precisely what the argument is meant to show. Similarly, as we saw above, given the substitutional analysis of 'at  $t$ ', the relativity of presentness reduces to the trivial fact that every instant is self-identical. But the trivial fact that Futuro is Futuro in no way implies that Futuro is present, just as the trivial fact that I am me in no way implies that I am an Olympic gymnast. The

<sup>15</sup> Of course, unlike the substitutional analysis, this is not an operator reductionist analysis of 'at  $t$ ' (as it contains the temporal operator 'A' on the right-hand side).

only way to reach the conclusion that Futuro is present is to add the premise that Futuro is present; but that is precisely what the argument is meant to show.

We now turn to Smith's (2010) argument.<sup>16</sup> According to Smith, if 'instant' means 'normal time' then given the moving spotlight theory the following argument is sound<sup>17</sup>:

- (1) For all instants  $t$ , at  $t$ ,  $t$  is present (RELATIVITY)
- (2) 1900 is present at 1900
- (3) For all instants  $t$ (at  $t$ ,  $t$  is present  $\supset t$  is present)
- (4) 1900 is present

The conclusion (4) is that 1900 is present; given that 1900 is also past, if (4) is true then 1900 is both past and present, which is a contradiction. The argument is valid; the question is whether moving spotlights should accept the premises. They should certainly accept premise (1), the principle that every instant is present relative to itself, and premise (2), which is simply an instance of this principle. For one thing, we saw above that (1) follows straightforwardly from both non-reductive and reductive analyses of 'at  $t$ '. For another, what would it mean to deny (1)? It would mean that some instant of time is not present from the perspective of itself. But that would be absurd: it would be like saying there is a story which is false from the perspective of that very story. Therefore moving spotlights should accept both premises (1) and (2). Premise (3) states that every instant is such that if it is present relative to itself, it is present. But why would a moving spotlighter accept this premise, given that it leads to contradiction? Smith attempts to motivate the premise by asking us to imagine a spacetime diagram representing the world as it is according to the moving spotlighter. He raises the following question concerning the diagram: which instant on the diagram must moving spotlights identify as the 'objective now' (that is, the absolute present)? The answer, one would have thought, is straightforward: the moment it is now. According to Smith, however, moving spotlights must identify *every* instant as present:

The now [i.e. the present] has to be in 1800- to represent the fact that as of 1800, 1800 was present... It also has to be in 1900- to represent the fact that as of 1900, 1900 was present. It also has to be in 3000- to represent the fact that as of 3000, 3000 will be present. And so on: the now has to be everywhen. (Smith 2010, p. 240)

In other words, every instant is present because every instant is present relative to itself! This is not an argument for premise (3) but merely a restatement of it. In fact, Smith provides no independent argument for premise (3). Given that there is no reason at all why moving spotlights should accept premise (3), they can easily

<sup>16</sup> Smith actually directs the argument against 'the A-theory'. However, as mentioned above, it seems clear that Smith's argument is directed against permanentist A-theories; in particular, Smith talks about the 'spacetime diagram' which represents the world as it according to the A-theorist.

<sup>17</sup> Smith allows that moving spotlights could reject the following argument if 'instant' refers to 'hypertime' (although according to Smith the view would then be subject to further objections). Here I assume that 'instant' refers to 'normal time'.

avoid Smith's argument. (Note that Smith (2010, pp. 241–244) assumes that moving spotlights will respond to his argument by appealing to fundamental temporal operators. However, we have seen that that is not the case.) Let us try to diagnose Smith's error. Smith thinks that given the moving spotlight theory, if an instant is present relative to itself then it is present simpliciter. Why? A reasonable conjecture is that Smith mistakenly assumes that given the moving spotlight theory expressions of the form 'at  $t$ ' (where  $t$  is the name of an instant) invariably display the same sort of logical behaviour as, for example, the expression 'In Co. Galway' in the sentence

(12) 'In Co. Galway, some people wear pampooties'

The expression 'In Co. Galway' in (12) simply serves to restrict the quantifier 'some people' to the good people of Co. Galway. Moreover, one can infer from (12) that some people wear pampooties. If 'at  $t$ ' always displayed the same logical behaviour as 'In Co. Galway' in (12), then one could always infer ' $t$  is present' from sentences of the form 'At  $t$ ,  $t$  is present'. One could then show that according to the moving spotlight theory every instant is absolutely present (and past, and future).<sup>18</sup>

Moving spotlights deny that expressions of the form 'at  $t$ ' function like the expression 'In Co. Galway' in (12). Rather, they hold that 'at  $t$ ' functions like the expression 'In *Star Wars*' in the sentence

(13) 'In *Star Wars*, there are Wookies'

The expression 'In *Star Wars*' in (13) functions as a sentence operator, so the logical form of (13) is something like

(14) 'According to the *Star Wars* films (there are Wookies)'

Crucially, one cannot infer from (14) that there are Wookies. Why not? The natural answer is: *because the Star Wars films aren't true*. Similarly, according to moving spotlights one cannot infer that 1900 is present from the sentence

(15) 'At 1900, 1900 is present'

Why not? The natural answer is: *because 1900 is not present*. Just as truth is the missing ingredient that would get one from (13) to the existence of Wookies, presentness (which *is* truth according to the theory that instants are propositions, but may also be fundamental) is the missing ingredient that would get one from (15) to the truth of '1900 is present'. The problem with Smith's argument is that like Bourne's, it requires as a premise just what it is supposed to show.

<sup>18</sup> Bourne's (2006) argument above seems to rest on the same mistake. See also Parsons (2002, p. 9), who holds that given the A-theory, one can always infer (for example) ' $x$  is past' from a sentence of the form 'At future instant  $t$ ,  $x$  is past'. Of course, this leads to contradiction given that, for example, at some future instant  $t$ , 2066 is past.

### 3.2 The epistemic argument

The McTaggartian arguments form one common line of attack against the moving spotlight theory. A second common line of attack is the *epistemic argument*, according to which the moving spotlight theory implies that we should believe that we are not now located at the present instant.<sup>19</sup> Sider (2011) describes the argument as follows:

We believe that we exist in the present; indeed, we take ourselves to know this. But given the spotlight theory, there are ever so many people, with similar evidence to our own, who also think they are in the present but are wrong—they're wrong because the times at which they are located do not have monadic presentness. George Washington, for example, thinks in 1776 that 1776 is present; we think, here in 2011, that 2011 is present. We cannot both be right, since the property of presentness is monadic and possessed by only one moment. And our evidence is no better than Washington's (we see flowers brightly blooming in 2011; he sees flowers brightly blooming in 1776, and so on), so it's hard to believe that we're more likely to be right than Washington. Indeed, it seems likely that we're both wrong, since 1776 and 2011 are merely two of the infinitely many times, only one of which has presentness. The spotlight theory leads to scepticism about whether we're in the present. (Sider 2011, p. 261)

To see why the epistemic argument fails, consider Sider's case of George Washington. Sider states, correctly, that 'George Washington, for example, thinks in 1776 that 1776 is present; we think, here in 2011, that 2011 is present.' More carefully, the following is true given the moving spotlight theory (remember that 'Presento' names the current instant): at some instant  $t$  in 1776, George Washington thinks that  $t$  is (absolutely) present, and at Presento, Dan thinks that Presento is (absolutely) present. Now, notice that there is no disagreement here: George Washington thinks *as of t* that  $t$  is present and I think *as of Presento* that Presento is present. Given that every instant is present relative to itself, as of our respective instants we are both right:  $t$  is indeed present at  $t$  and Presento is indeed present at Presento (as we saw above, according to operator reductionist classic MST this amounts to nothing more than each of  $t$  and Presento being self-identical). Of course, we would *not* both be right if George Washington thought that  $t$  is present and I thought that Presento is present, given that it is always the case that exactly one instant is present and  $t \neq$  Presento. But there is no reason at all why a moving spotlihter would claim that George Washington thinks that  $t$  is present. Given that whatever is the case at the present instant is the case simpliciter, it follows from the fact that at Presento, I think that Presento is present that I think that Presento is present. But it does not follow from the fact that at  $t$ , George Washington thinks that

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<sup>19</sup> Bourne (2002) and Braddon-Mitchell (2004) put forward an analogous argument against the growing block theory (defended by Tooley 1997), and Lewis (1986, p. 93) seems raise an analogous argument against the modal A-theory. There is no obvious reason why the response described in what follows could not be modified by growing blockers and modal A-theorists to respond to those arguments.

$t$  is present that George Washington thinks that  $t$  is present; the ‘at  $t$ ’ in ‘At  $t$ , George Washington thinks that  $t$  is present’ is not inert, and does not simply ‘drop off’.

Without disagreement between me and George Washington there is no epistemic argument, as the argument relies on the premise that there is massive disagreement between individuals located at past, present, and future instants about which instant is present (‘the [epistemic] objection turns on the fact that the spotlight theorist thinks that many people such as Washington think that they’re in the present’). This disagreement is supposed to induce scepticism in those of us located at Presento that Presento really is the present instant, given the further premise that our evidence that Presento is present is no better than the evidence of those located at other instants that those instants are present (‘our evidence is no better than Washington’s’). But as we have seen, there is no such disagreement, and therefore no argument against the moving spotlight theory.

Sider’s epistemic argument involves a familiar error: the idea that given the moving spotlight theory one can always infer ‘ $\phi$ ’ from ‘at instant  $t$ ,  $\phi$ ’. As we saw above, Bourne (2006) commits this error by assuming that given the moving spotlight theory, if an instant is present at some future instant then it is present simpliciter. Similarly, Smith (2010) assumes that given the moving spotlight theory, if an instant is present relative to itself then it is present simpliciter; in other words, that if at  $t$ ,  $t$  is present then  $t$  is present. Sider’s epistemic argument commits the same sort of mistake: Sider assumes that given the moving spotlight theory, if Washington thinks in 1776 that 1776 is present then Washington thinks that 1776 is present; in other words, that if at 1776, Washington thinks that 1776 is present, Washington thinks that 1776 is present. However, moving spotlights do not allow this sort of inference. They hold that as of 1776, Washington thinks (correctly) that 1776 is present; they certainly do not hold that this implies that Washington thinks that 1776 is present. After all, if one could always infer ‘ $\phi$ ’ from ‘at  $t$ ,  $\phi$ ’, then given that there is an instant at which I am sitting and another at which I am standing, it would follow that I am both sitting and standing! More generally, if moving spotlights always allowed this sort of inference the view would be massively contradictory, as it would entail that *things always have all the properties they ever have*.

#### 4 Conclusion

It is not easy to be a moving spotlifter; the theory is frequently misconceived and faces some well-known and apparently serious objections. In this paper I have tried to clear up the misconceptions and provide responses to the common arguments against the view. Of course, there are other reasons not to be a moving spotlifter: for example, there is the argument that the A-theory is inconsistent with the Special Theory of Relativity, and therefore false.<sup>20</sup> Some theorists also find permanentism wholly implausible; they hold that it is just obvious that the River Lee did not exist

<sup>20</sup> This argument is famously put forward by Putnam (1967); see also Baker (1974).



(not even as a future river) at the instant following the Big Bang. However, these are objections against permanentism or the A-theory, and as such they also apply to A-theories such as presentism and permanentist theories such as four-dimension-ism. Therefore, although life may not be easy for moving spotlighters, there do not seem to be any *special* reasons not to combine permanentism and the A-theory.

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