Erkenntnis (2022) 87:1635–1658
https://doi.org/10.1007/s10670-020-00265-w

ORIGINAL RESEARCH

Hazardous Conditions Persist

Daniel Deasy[1] · **Jonathan Tallant**[2]

Received: 5 June 2019 / Accepted: 6 April 2020 / Published online: 20 May 2020

Abstract
Some theories in the philosophy of time combine a commitment to the existence of non-present regions of spacetime with the view that there is a perspective-independent present time. We call such theories *4D A-theories*. There is a well-known objection to 4D A-theories, as follows: 4D A-theories entail that the vast majority of subjects across time believe falsely that they are present. But if the vast majority of subjects across time believe falsely that they are present, *we* do not know that *we* are present. We call this the *Epistemic Objection* to 4D A-theories. In this paper we do two things: first (Sect. 2), we describe and assess a number of different versions of the Epistemic Objection. We argue that there is only one version of the objection—the version due to Russell (*Noûs* 51:152–174, 2015) that we call the *Safety Argument*—that does not rely on implausible epistemic principles which entail radical scepticism. Second (Sect. 3), we raise objections to the main strategies adopted by 4D A-theorists in response to the Safety Argument. We conclude that the Epistemic Objection—in the form of the Safety Argument—remains a threat to 4D A-theories.

1 Introduction

Some theories in the philosophy of time combine a commitment to the existence of non-present regions of spacetime with the view that there is a perspective-independent present time. For example, according to the Growing Block Theory (GBT), there are past (but not future) regions of spacetime, and the present time is the *time than which there is no later*—the 'leading edge of the growing block'.[1] Similarly,

[1] Proponents of GBT include Broad (1923), Briggs and Forbes (2017), Forbes (2016), Forrest (2004), and Tooley (1997).

✉ Daniel Deasy
daniel.deasy@ucd.ie

Jonathan Tallant
jonathan.tallant@nottingham.ac.uk

[1] School of Philosophy, University College Dublin, Dublin, Ireland

[2] Department of Philosophy, University of Nottingham, Nottingham, UK

according to the Moving Spotlight Theory (MST), there are both past and future regions of spacetime, and the present time is the time that possesses the fundamental property of presentness—the time 'on which the spotlight of presentness shines'.[2] Let us call such theories *4D A-theories*.[3] 4D A-theories can be contrasted with *3D A-theories* such as Presentism, according to which there is a perspective-independent present time but there are no non-present regions of spacetime[4]; and *B-theories* such as the views defended by Mellor (1998) and Sider (2001), according to which there are (relatively) non-present regions of spacetime, but there is no perspective-independent present time.

There is a well-known objection to 4D A-theories, as follows: 4D A-theories entail that the vast majority of subjects across time believe falsely that they are present. For example, given that e.g. Napoleon *did believe* that he is present, according to both GBT and MST, Napoleon *believes* at various past times that he is present. But of course, given that the times at which Napoleon believes that he is present are now past—either due to the 'growth of the block' (GBT) or the 'movement of (fundamental) presentness' (MST)—Napoleon's belief at those times is now false. But if the vast majority of subjects across time believe falsely that they are present, *we* do not know that *we* are present. We call this the *Epistemic Objection* to 4D A-theories.[5]

In this paper we do two things: first (Sect. 2), we describe and assess a number of different versions of the Epistemic Objection. We argue that there is only one version of the objection—the version due to Russell (2015) that we call the *Safety Argument*—that does not rely on implausible epistemic principles which entail radical scepticism. Second (Sect. 3), we raise objections to the main strategies adopted by 4D A-theorists in response to the Safety Argument. We conclude that the Epistemic Objection—in the form of the Safety Argument—remains a threat to 4D A-theories.

2 The Epistemic Objection

Braddon-Mitchell (2004) raises the question of whether we should believe that we are present given GBT. His answer is 'no' (2004, 199):

> I argue that on the growing salami view [GBT], it is almost certainly not now. It is not now; or less tendentiously, the current time is probably not the present.

[2] Proponents of MST include Cameron (2015) and Deasy (2015). The view is also discussed by Skow (2009) and Zimmerman (2005).

[3] Our use of '4D' here is not meant to suggest a commitment on the part of the relevant theories to anti-endurantist theories of persistence (see especially Sider 2001), but simply to the existence of non-present regions of spacetime. Moreover, we allow that theories according to which (perspective-independent) presentness is *non-fundamental* still count as A-theories (GBT is one such theory).

[4] Some Presentists identify times with maximal, consistent, sometime-true propositions, in which case the present time is just the *true* time—see e.g. Markosian (2004) and Crisp (2007).

[5] See, *inter alia*, Bourne (2002), Braddon-Mitchell (2004, 2013), Button (2006, 2007), Cameron (2015), Correia and Rosenkranz (2013), Deasy (2015), Forbes (2016), Merricks (2006), Russell (2015) and Tallant (2007, 2011).

However, according to critics, Braddon-Mitchell's argument for this conclusion isn't clear. In particular, Russell (2015, 153) writes:

> It's not clear from existing presentations how the details of the argument are supposed to go—how it might show that even those who happen to have true beliefs about the absolute present still lack knowledge.

In the rest of this section, we describe and assess five versions of the Epistemic Objection: four that we find in Braddon-Mitchell (2004), and a fifth due to Russell (2015).

2.1 The Explanatory Argument

Here is the first claim Braddon-Mitchell makes (2004, 200; our emphasis):

> It [GBT] shares with the presentist the view that there is an objective fact about which hyperplane is the true present. But it shares with the four-dimensionalist the view that there is much more to space–time that just this one hyperplane. *So the growing salami view cannot explain that we know that the current moment is the present by the fact that the current moment is the only moment, for there are very many perfectly real past moments.*

In the emphasised portion of the quotation, the focus seems to be on *explanation*: the charge seems to be that given GBT, there is no explanation for how we know that we are present. Generalising to all 4D A-theories, the argument can be expressed as follows:

(1) There is no explanation for how we know that we are present given 4D A-theories.
(2) For any theory of time T, if there is no explanation for how we know that we are present given T, we ought to reject T.

Therefore

(3) We ought to reject 4D A-theories.

Call this the *Explanatory Argument*.

The Explanatory Argument must be handled with care, because both premise (1) and the antecedent of premise (2) are plausibly ambiguous: there are two importantly different ways of understanding the idea of *a theory's failing to explain how we know that p*. First, let us assume that if a subject S knows that p then S believes that p, p is true, and S is epistemically justified in believing that p.[6] A theory might

[6] We make no assumptions here about whether true, epistemically justified belief is sufficient (rather than simply necessary) for knowledge, or about precise the nature of epistemic justification—for example, whether epistemic justification entails knowledge (see e.g. Williamson (forthcoming in Dutant and Dorsch (eds.), *The New Evil Demon*) for a defence of this view).

'fail to explain how we know that *p*' in the sense that it fails to explain (for example) *why* we believe that *p*, and *why p* is true, and *why* our belief that *p* is epistemically justified. But the fact that a theory T fails to explain how we know that *p* in this sense might not provide a good reason for rejecting T, even if the subject matter of *p* is very closely related to the subject matter of T. For example, a certain physics theory T might fail to explain why we believe that there is matter, and why there is matter at all, and why our belief that there is matter is epistemically justified—but that would not automatically provide us with a good reason to reject T. Similarly, a certain mereological theory T* might fail to explain why we believe that there are composite objects, and why there are composite objects at all, and why our belief that there are composite objects is epistemically justified[7]—but that would not automatically provide us with a good reason to reject T*.

Second, a theory might 'fail to explain how we know that *p*' in the sense that it entails that we do not know that *p*. For example, a theory of mind according to which we have no beliefs, or according to which nothing is conscious, would fail to explain how we know that we are conscious in this sense. And if we had some reason for thinking that we *do* know that *p* then we would have a reason for rejecting theories that fail to explain how we know that *p* in this sense. For example, if we have a reason for thinking that we know that we are conscious, then we have a reason to reject theories of mind which entail that we don't know that we are conscious.

Having disambiguated the idea of *a theory's failing to explain how we know that p*, we can now assess the Explanatory Argument on behalf of 4D A-theorists. First, we argue that if a theory's failure to explain how we know that *p* is understood as its failing to explain why we believe that *p*, and why *p* is true, and why our belief that *p* is epistemically justified, then 4D A-theorists ought to reject premise (2) of the Explanatory Argument: it is not true that we ought to reject a theory of time T if it fails to provide an explanation for how we know that we are present in this sense. Rather, the facts that (for example) we believe that we are present, that we are present, and that we are epistemically justified in believing that we are present, can quite properly be taken for granted by 3D A-theoritists, 4D A-theorists, and B-theorists alike—just as a philosopher of mind, in developing her theory of consciousness, may properly take it for granted that we believe that we are conscious, that we are conscious, and that we are epistemically justified in believing that we are conscious. (This is not to say that there is no room for debate in the philosophy of mind about whether we really are conscious—just as there is room for debate in the philosophy of time about whether we really are present, or whether, for example, time is unreal, and therefore nothing is really past, present, or future—see e.g. McTaggart (1927) and Barbour (1999). The point is simply that it's false that we ought to reject any theory of time that fails to explain why we are present, rather than simply taking it for granted that we are present and then explaining e.g. what *times* are, and what it is for a time to be *present*, and so on.)

[7] We assume that there *are* composite objects—mereological nihilists can change the example to suit their view.

On the other hand, if a theory's failure to explain how we know that p is understood as its entailing that we don't know that p, then premise (2) of the Explanatory Argument seems plausible—it is true that we ought to reject any theory of time that entails that we don't know that we are present. But then what about premise (1)? Is it true that 4D A-theories in particular entail that we don't know that we are present? As we shall below, there are a number of different arguments for this conclusion, each of which can be considered a distinct version of the Epistemic Objection. But insofar as the Explanatory Argument is not taken to incorporate one of these arguments as a justification for premise (1), it fails to provide 4D A-theorists with a reason for accepting premise (1). In short, the Explanatory Argument is no threat to the 4D A-theory when it is treated as a *distinct* version of the Epistemic Objection.

2.2 The Indifference Argument

Here is Braddon-Mitchell (2004, 200–201) again:

> There is no reason on the growing salami view [GBT] to think that the objective present is not located at any particular point in some volume of space–time that may lie in the future direction from us. Of course, if our current location is the objective present, then there is no future volume, but to know that our current location is the objective present we would need to know that there is no future-directed volume, and we have no independent access to this. So by a principle of indifference we should regard all alternatives as equally likely. So we should regard the hypothesis that the current moment is present as only one among very many equally likely ones. So we should conclude, therefore, that the current moment is almost certainly in the past.

In the above quotation, Braddon-Mitchell argues that given GBT 'by a principle of indifference we should regard all alternatives as equally likely' and therefore 'we should conclude… that the current moment is almost certainly in the past'. This suggests a version of the Epistemic Objection that relies on the well-known *Principle of Indifference*[8]:

> PRINCIPLE OF INDIFFERENCE: Given n mutually exclusive and jointly exhaustive possibilities $c_1 \ldots c_n$, each of which is consistent with our evidence, the probability of each of $c_1 \ldots c_n$ is $1/n$

What are the relevant 'mutually exclusive and jointly exhaustive possibilities, each of which is consistent with our evidence'? As the beginning of the above quotation makes clear, these are supposed to be the possibilities that we are present (i.e. located at the time than which there is no later); that we are located one moment earlier than the present; that we are located two moments earlier than the present; and so on.[9] The idea is that each of these possibilities is consistent with our evidence

[8] We borrow this formulation from Weisberg (2015).

[9] For ease of exposition, we speak here as if time is discrete rather than continuous.

because in order to have evidence that supports one of these possibilities—for example, that we are located at the time than which there is no later—we would need to have evidence of how far into the relative future spacetime extends (if at all), and as Braddon-Mitchell puts it, 'we have no independent access to this'. Given that the number of relevant possibilities is vast, it follows by the Principle of Indifference that the probability of each possibility is equally tiny. Given that we are earlier than the present (i.e. past) in all but one of the relevant possibilities, it follows that the probability that we are present is very low, and the probability that we are past is very high. Assuming that we should match our credences to the probabilities, it follows that given GBT, our credence that we are present should be very low, and our credence that we are past should be very high.

Braddon-Mitchell's argument is clearly targeted at GBT, but it is easy to see how it generalises to all 4D A-theories:

(1) Given 4D A-theories, there is a vast number of mutually exclusive and jointly exhaustive possibilities $c_1 \ldots c_n$ concerning our location in time relative to the present (e.g. concerning our location relative to the 'edge of the growing block' (GBT) or to the 'spotlight of presentness' (MST)) in only one of which we are present and in the rest of which we are non-present.
(2) Given 4D A-theories, each of $c_1 \ldots c_n$ is consistent with our evidence.

Therefore

(3) Given 4D A-theories, the probability that we are present is very low and the probability that we are non-present is very high (from (1), (2) and the Principle of Indifference).

From (3) it follows that given 4D A-theories, our credence that we are present should be very low, and therefore we do not know that we are present. But of course, we do know that we are present; therefore, we should reject 4D A-theories. We call this the *Indifference Argument*.

Russell (2015, 155) argues that 4D A-theorists can resist the Indifference Argument by rejecting premise (2), according to which our evidence fails to distinguish between the different possibilities concerning our location in time relative to the present (note that 'Grover' names Russell's fictional GBTer; the emphasis is ours):

> Indifference principles only apply when all of the various possibilities in question are compatible with your evidence… There can be lots of bad cases and very few good ones without any threat to knowledge or high probability, if your evidence rules out the bad cases. *What is needed, and what is lacking, is an argument for parity of evidence in this case*: that Grover has no relevant evidence now that he will lose when the block grows.

Why would we think that given 4D A-theories, our evidence fails to distinguish between the different possibilities concerning our location in time relative to the present? One natural idea is that our *evidence* is simply our qualitative experience, and

given 4D A-theories, whether we were present or non-present would make no difference to our qualitative experience. Call the former thesis *E = Q*:

E = Q: For any subject S, S's evidence = S's qualitative experience

Given E = Q and the premise that given 4D A-theories, whether we were present or non-present would make no difference to our qualitative experience, it follows that our evidence fails to distinguish between the different possibilities concerning our location in time relative to the present—i.e. that premise (2) of the Indifference Argument is true.

The problem with this argument is that E = Q entails radical scepticism. In particular, grant that if one's evidence is consistent with *p*'s being false, one does not know that *p*.[10] Given E = Q, it follows that if one's qualitative experience is consistent with *p*'s being false, one does not know that *p*. Russell (2015, 155) calls this thesis 'Experience':

EXPERIENCE: If a subject S's qualitative experience is compatible with not-*p* then S does not know that *p*

This principle entails scepticism about the external world: for instance, given that our qualitative experience is consistent with our being handless Putnamian 'brains-in-vats', it follows from Experience that we do not know that we have hands. Thus 4D A-theorists have a good reason to reject E = Q.

A defender of the Indifference Argument might respond here that nothing as strong as E = Q is required in order to support premise (2)—rather, all that is required is the weaker claim that our evidence *concerning whether we are present* is just our qualitative experience. Call this thesis *EP = Q*:

EP = Q: For any subject S, S's evidence concerning whether S is present = S's qualitative experience

Premise (2) of the Indifference Argument follows from EP = Q and the premise that given 4D A-theories, whether we were present or non-present would make no difference to our qualitative experience. And EP = Q clearly does not have the radical sceptical consequences of E = Q. However, given the other premises of the Indifference Argument, EP = Q clearly has the consequence that given 4D A-theories, we do not know that we are present. And this alone gives 4D A-theorists a good reason to reject it. But then the burden is on 4D A-theorists to propose an alternative to E = Q and EP = Q—in other words, 4D A-theorists must answer the question of how they conceive of *evidence*.

In answer to this question, Russell (2015, 155) argues that 4D A-theorists should accept a conception of evidence on which necessarily, a subject S's evidence depends not just on S's qualitative experience, but on the *nature of S's environment*:

[10] This principle is entailed by the view that knowledge is evidence—see e.g. Williamson (1997, 2000).

> Grover can take advantage of familiar replies to the radical sceptic. For instance: *evidence* is not determined by qualitative experience… Grover has evidence that he has hands: he can feel them and see them. Grover's envatted counterpart Bryn has no such evidence: Bryn merely seems to feel and see hands, but in fact has no hands to be felt or seen. The difference between feeling hands and merely seeming to feel hands is not a difference just in "what it is like" for either of them: it is partly a matter of having hands.

According to Russell, just as the anti-sceptic who rejects E = Q can resist scepticism about the external world by arguing that it is of the nature of evidence that necessarily, one has evidence that e.g. one has hands only if one has hands, a 4D A-theorist who rejects E = Q (and, indeed, EP = Q) can resist the Indifference Argument by arguing that it is of the nature of evidence that necessarily, one has evidence that one is present only if one is present. Given this conception of evidence, it follows that premise (2) of the Indifference Argument is false: we have evidence that we would not have were we non-present; in possible situations in which we are located at a non-present time, we lack the evidence that we actually have that we are present. As long as having evidence that one is present strictly requires one's being present, it follows that given 4D A-theories, our evidence is not after all consistent with the possibility that we are non-present.

We have seen that 4D A-theorists can resist the Indifference Argument by accepting a conception of evidence on which necessarily, one has evidence that one is present only if one is present. But this response raises two important questions: first, what is the *nature* of our evidence that we are present, such that our having evidence that we are present strictly requires our being present? And second, is the view that our having evidence that we are present strictly requires our being present consistent with the underlying metaphysics of 4D A-theories?

As for the first question, Russell (2015, 155) suggests that given 4D A-theories, our evidence that we are present is gained by our 'recognizing absolute presence':

> Maybe Grover gets evidence by *recognizing* absolute presence (perceptually? intuitively?) in a way that necessarily involves *being* absolutely present—just as the evidence Grover gets by feeling his hands necessarily involves having hands.

However, we disagree that 4D A-theorists should take this route. In particular, although defenders of MST might be able to tell some story about how we (perceptually? intuitively?) recognise the fundamental property of presentness, it seems implausible to us that given GBT, our evidence that we are present is gained by our recognising absolute presence. According to GBT (and in contrast to MST), absolute presentness is an *extrinsic* property of times: for a time t to be present is just for t to be the time than which there is no later. But how could a subject recognise the property of *being a time than which there is no later*? Rather, we think that 4D A-theorists should follow Williamson (1997, 2000) in simply identifying evidence with knowledge:

E = *K*: For any subject S, S's evidence = S's knowledge

Given that knowledge is factive (i.e. a subject S knows that *p* only if *p*), it follows from E = K that evidence is factive (i.e. a subject S has evidence that *p* only if *p*)—and therefore that one has evidence that one is present only if one is present. Thus as a thesis concerning the nature of evidence, E = K straightforwardly secures the desired result that our having evidence that we are present strictly requires our being present.[11]

We now turn to our second question: is the view that our having evidence that we are present strictly requires our being present consistent with the metaphysics of 4D A-theories? In order to answer this question, let us first consider MST. Although there are many different versions of MST (see e.g. Cameron 2015, Deasy 2015, Miller 2019 and Skow 2015), for now let us consider a more or less 'classic' version of the view according to which: (1) reality contains a four-dimensional spacetime manifold; (2) *times* are maximal simultaneous regions of spacetime—i.e. 'hyperplanes'; (3) exactly one time possesses the fundamental property of *presentness*; and (4) presentness is the one and only *temporary* fundamental property. Call this final thesis *Spotlight*:

SPOTLIGHT: Presentness is the unique temporary fundamental property

By 'temporary property' here we mean a property that sometimes, something sometimes possesses and sometimes doesn't possess:

TEMPORARY PROPERTY: A property *F* is *temporary* just in case sometimes, something is sometimes *F* and sometimes not *F* ($S\exists x(SFx \bigwedge S\neg Fx)$)[12]

Assuming that every temporary property must be analysed at least partly in terms of some temporary *fundamental* property, it follows given Spotlight that on this version of MST, the only temporary properties are (1) presentness and (2) properties the possession of which involves (either explicitly or implicitly) bearing some relation to the present time (such as *being a dinosaur at a present time*).[13]

It should be clear that the view that our having evidence that we are present strictly requires our being present is consistent with the core commitments of MST. Given that according to MST presentness is a temporary property (from Spotlight), it follows that given MST, if our having evidence that we are present strictly requires our being present, then the property of *having evidence that one is present* is also a temporary property. But is the temporariness of the property of having evidence that

[11] Note that to accept E = K is *not* to deny that qualitative experience is a source of evidence—given that our qualitative experience is a source of knowledge, it follows from E = K that our qualitative experience is a source of evidence.

[12] A non-temporary or *permanent* property is a property such that always, if something has it, it always has it ($A\forall x(Fx \rightarrow AFx)$).

[13] This does not exclude the possibility that according to MST, the properties of e.g. *being a dinosaur* and of *being blue* are temporary properties. All that is required is that these properties ultimately involve bearing some relation to the present time, so that e.g. to be a *dinosaur* is just to be a *dinosaur at a present time*, and to be *blue* is just to be *blue at a present time*. We return to this idea below in Sect. 2.5.

one is present consistent with MST? Yes: as we saw above, given MST (or at least, the version we are working with here), if a property is temporary then possessing it involves (either explicitly or implicitly) bearing some relation to the present time. And given the view that our having evidence that we are present strictly requires our being present, it follows that the property of having evidence that one is present (implicitly) involves bearing some relation to—more specifically, being located at—the present time. It follows that defenders of MST can resist the Indifference Argument by rejecting E = Q in favour of the view that our having evidence that we are present strictly requires our being present.

It should be clear how the above point extends to GBT. First, say that a property is 'sticky' just in case if anything ever has it, it *always will* have it:

> STICKY PROPERTY: A property *F* is *sticky* just in case always, if something is *F* then it always will be *F* ($A\forall x(Fx \supset GFx)$)

A 'non-sticky property', then, is a property that sometimes, something has but is not always going to have.[14] According to standard versions of GBT, *non-sticky* properties include (but are not limited to): (1) presentness (i.e. being the time than which there is no later); (2) properties the possession of which involves (either explicitly or implicitly) bearing some relation to the present time (such as *being a dinosaur at a present time*); and (3) properties such as *being the first person on the moon*, which depend in some sense on what happens in the future.

The question for GBTers is: is the temporariness of the property of having evidence that one is present consistent with GBT? Yes: as we saw above, given GBT, one way for a property to be non-sticky is for possession of it to involve (either explicitly or implicitly) bearing some relation to the present time. And given the view that our having evidence that we are present strictly requires our being present, it follows that the property of having evidence that one is present (implicitly) involves bearing some relation to—more specifically, being located at—the present time. It follows that defenders of GBT can resist the Indifference Argument by rejecting E = Q in favour of the view that our having evidence that we are present strictly requires our being present.

2.3 The Closure Argument

In the passage quoted at the beginning of the previous subsection, Braddon-Mitchell writes:

> Of course, if our current location is the objective present, then there is no future volume, but to know that our current location is the objective present we would need to know that there is no future-directed volume, and we have no independent access to this.

[14] Being non-sticky is one way—but of course, not the only way—for a property to be temporary.

This suggests a version of the Epistemic Objection that relies on the principle that knowledge is closed under known entailment:

> CLOSURE OF K: If a subject S knows that p and S comes to believe q by correctly deducing q from p, S knows that q

We can spell out the argument as follows:

(1) We know that if we are present then we are not non-present (e.g. past)
(2) If we know that we are present then we know that we are not non-present (from (1) and Closure of K).
(3) If we do not know that we are not non-present then we don't know that we are present (from (2) by contraposition).
(4) Given 4D A-theories, we do not know that we are not non-present.

Therefore

(5) Given 4D A-theories, we do not know that we are present.

Call this the *Closure Argument*. The argument is structurally analogous to the well-known argument for scepticism about our knowledge of the external world, according to which e.g. we don't know that we have hands because we don't know that we're not Putnamian brains-in-vats, and if we don't know that, we don't know that we have hands.

One question we ought to raise about this argument is why anyone would accept premise (4), according to which given 4D A-theories, we don't know that we are not non-present. Here is one way of defending that premise:

(6) If a subject S's evidence in two possible cases c_1 and c_2 is the same, then if S does not know that p in one of those cases, S does not know that p in the other case.
(7) Given 4D A-theories, our evidence would be the same whether we were present or non-present.
(8) If we were non-present, we would not know that we were not non-present (from the facitivity of knowledge).

Therefore

(4) Given 4D A-theories, we do not know that we are not non-present.

In short, our inability to detect whether or not we are present given 4D A-theories—e.g. in terms of GBT, our inability to detect whether or not we are located at the time than which there is no later—implies that we do not know that we are not past.

Having seen how 4D A-theorists can resist the Indifference Argument, it is easy to see how they can also resist this argument. As we saw in the previous subsection, the only plausible defences for a premise such as (7) rely either on E = Q—which

entails radical scepticism—or EP = Q, which given 4D A-theories, guarantees scepticism about our knowledge that we are present. Given that 4D A-theorists have good reasons to reject both kinds of scepticism, they have good reasons to reject both E = Q and EP = Q. And as we saw above, one way to do that is to accept E = K, which given the facitivity of knowledge (and therefore the facitivity of evidence) implies the falsehood of premise (7). Thus 4D A-theorists can resist the Closure Argument by rejecting premise (4).

2.4 The Evidence Argument

We have seen that 4D A-theorists can resist the Closure Argument. But perhaps there is another way to interpret the quotation from Braddon-Mitchell at the top of the previous subsection. In particular, it could be that the focus of the argument is not on parity of evidence across 'good' and 'bad' cases given 4D A-theories (premise (7)), but rather on our inability to gain the relevant kind of evidence given 4D A-theories ('we have no independent access to [the fact that there is no future-directed volume of spacetime]'). Here is one way of spelling out this argument:

(1) For any subject S, S knows that *p* only if S has good evidence that *p*.
(2) For any subject S, S knows that S is present only if S has good evidence that S is present (from (1)).
(3) Given 4D A-theories, we have good evidence that we are present only if we have good evidence that we are located at the time than which there is no later (GBT) or located at the time that possesses fundamental presentness (MST).
(4) Given 4D A-theories, we could not have good evidence that we are located at the time than which there is no later (GBT) or located at the time that possesses fundamental presentness (MST).

Therefore

(5) Given 4D A-theories, we do not know that we are present (from (2), (3) and (4)).

Call this the *Evidence Argument*. Putting aside the difficult question of exactly what it means for evidence to be 'good', premises (1) and (2) of the Evidence Argument seem reasonable. Premise (3) seems to follow straightforwardly from the 4D A-theorists' conception of what it is to be *present*.[15] But what about premise (4)? Is it true that e.g. given GBT, we could not have good evidence that we are located at

[15] 4D A-theorists such as Forbes (2016) who argue that only present events are occurring (or happening) might resist this premise on the grounds that, on their view, we have good evidence that we are present only if we have good evidence that we are located at the time at which events are occurring (or at which 'things are happening'). They could then argue that contrary to the relevant analogue of premise (4), we *do* have good evidence that we are located at the time at which events are occurring. We focus on the 'traditional' versions of 4D A-theories in the text, as these seem more vulnerable to the Evidence Argument.

the time than which there is no later? As should be clear from the discussion in Sect. 2.2 above, we think the answer to this question depends on how 4D A-theorists conceive of *evidence*. For example, if evidence is conceived in such a way that for a subject S to gain evidence that *p* requires that S be somehow 'causally impacted' by the fact that *p* (or by the subject of *p*), then (4) might seem plausible: for a range of reasons—e.g. no backwards causation, the principle that nothing comes from nothing—it is hard to believe that given GBT, a subject could be causally impacted by the relational fact that she is located at the time than which there is no later.[16]

However, suppose that our GBTer accepts E = K, the thesis that evidence is knowledge. In that case, she will hold that in order for a subject S to have evidence that *p*, S must know that *p*. The question for her, then, is what does it take to *know* that one is located at the time than which there is no later? Suppose she answers as follows: in order to know that *p*, one's belief that *p* must be *safe*, in the sense that one could not easily have believed *p* falsely. In other words, she accepts the following epistemic principle[17]:

> SAFETY OF K: A subject S knows that *p* only if there are no close possible situations in which S falsely believes that *p*

She can then argue that in the absence of any reason to think that given GBT, our belief that we are located at the time than which there is no later is *unsafe*, we have no reason to think that we do not know that we are located at the time than which there is no later; and therefore given E = K, we have no reason to think that we do not have (good) evidence that we are located at the time than which there is no later. On these grounds, she can reject premise (4) of the Evidence Argument. And of course, an MSTer could argue analogously.

2.5 The Safety Argument

We saw above that 4D A-theorists can resist the Evidence Argument on the grounds that it fails to provide any reason for thinking that given 4D A-theories, our belief that we are present is (epistemically) unsafe. We now turn to consider a version of the Epistemic Objection due to Russell (2015, 157) which argues for exactly that conclusion. The argument can be expressed as follows (where 'P' names the proposition *that this time is the present time*):

(1) If one knows that P then necessarily, if anyone closely believes P then P.
(2) We closely believe that P.
(3) Given 4D A-theories, if someone closely believes P, it will always be the case that someone closely believes P.
(4) Given 4D A-theories, it won't always be the case that P.

[16] Similarly, one might find it hard to believe that given MST, a subject could be causally impacted by the fact that she is located at the time which possesses fundamental presentness.

[17] See inter alia Sosa (1999), Williamson (2000, Chapter 5), and Pritchard (2005).

(5) Given 4D A-theories, it won't always be the case that if anyone closely believes P then P [from (1)–(4) and the tense-logical principle *K* that if always φ, and always if φ then ψ, then always ψ].
(6) If necessarily φ then always φ.

Therefore

(7) Given 4D A-theories, we don't know that P.

Call this the *Safety Argument*. Premise (1) is an instance of Safety of K above, according to which knowledge excludes the close possibility of error. But what exactly does it mean to say that a possible situation is 'close' in the sense of Safety of K? Or, focusing on the instance of the principle in premise (1) above, what does it mean to say that someone 'closely believes' that P? Here is Russell (2015, 156):

> The idea is that a close belief has a sufficiently similar basis to yours. This is rough, and it may well be impossible to elucidate closeness without eventually appealing back to knowledge. But we can still make good judgments in lots of cases. "Basis" is used in an extended sense: a belief's basis isn't generally "in the head". Possible believers in situations with importantly different environments, or causal laws, or underlying metaphysics, typically don't count as close.

As for the other premises: premise (2) is an uncontentious claim concerning what is 'close' to what in the relevant sense. Premise (3) is equivalent to the claim that given 4D A-theories, the property of *closely believing that P* is a *sticky* property: once someone has it, they always will have it. Premise (4) follows from the fact that given 4D A-theories, presentness is temporary. And premise (6)—that what is necessarily the case is always the case—is a very plausible principle, equivalent to the principle that what will happen, can happen.[18] The conclusion of the argument is that given 4D A-theories, we don't know that this time is the present time. Given that if we don't know that this time is the present time we don't know that we are present, it follows that given 4D A-theories, we don't know that we are present.

Can 4D A-theorists resist the Safety Argument? Let us begin with GBT. We saw above that GBTers can resist the Indifference and Closure Arguments by arguing that our having evidence that we are present strictly requires our being present, from which it follows given the non-stickiness of presentness that the property of *having evidence that one is present* is a non-sticky property. Therefore, a natural way for GBTers to try to resist the Safety Argument is to argue that given GBT, the property of *closely believing that P* is also a non-sticky property, in which case premise (3) of the Safety Argument is false. Interestingly, there are at least two ways for GBTers to do this.[19]

[18] Kaplan (1979) rejects this principle, but Dorr and Goodman (2019 in *Noûs*) defend it.
[19] The two different versions of GBT that we describe in what follows correspond roughly to Perović's (2019) 'Dead Past Growing Block' and 'Fourdimensional Growing Block' respectively.

The first is to follow Forrest (2004) and Forbes (2016) in arguing that given GBT the past is 'real but dead', in the sense that necessarily, things are *active* and events are *occurring* only if they are located at the present time (i.e. the time than which there is no later). Here is Forbes (2016, 703):

> Taking my lead from Forrest [2004], I think the Growing-Block view [GBT] should claim that whether something is active, or doing something, or undergoing processes, or conscious, is an extrinsic matter. Here's what I mean: If we want to know whether x is Φing, wherever x is in our ontology, we should not merely look at x, but look at the relations x stands in. In particular, we should look at what events x is succeeded by. If x is wholly located in the past, then x is not Φing, because a necessary condition on Φing is being succeeded by no events.

According to Forbes, GBTers should hold that for any x (quantifying unrestrictedly), x is Φing only if x is succeeded by no events—i.e. only if x is located at the present time. It follows that for any event e, e is *occurring* only if e is located at the present time, and therefore that there are no events occurring in the past (i.e. at times earlier than the present time). But if there are no events occurring in the past, then no (merely) past subjects have beliefs—belief requires *mental activity*, and mental activity requires *activity*. It follows that for any subject S, S has beliefs only if S is located at the present time. Given that which time is present changes, it follows that the property of *believing that p* is non-sticky: non-present subjects such as Napoleon *did* have beliefs, but given that they are now past they are no longer active, and therefore no longer have beliefs. But if the property of *believing that p* is non-sticky, the property of *closely believing that P* is also non-sticky, and therefore premise (3) of the Safety Argument is false.

As we saw above, Forbes' Forrest-inspired strategy for resisting the Safety Argument relies on the claim that given GBT, "a necessary condition on Φing is being succeeded by no events", so that e.g. a necessary condition on an event e's occurring is that e is located at the present time. But why should this be? In particular, why is it the case that given GBT, only *present* events possess the fundamental property of occurring?[20] In the absence of some 'deeper' metaphysical explanation for the holding of the relevant conditionals, this might seem like a mere stipulation designed to avoid the Epistemic Objection. Forbes is sensitive to this potential objection—he writes (ibid, 705–706):

> If we think of activity as being extrinsic, we avoid the need to explain… why it is so systematically related to the edge of the block. This is because, on the Growing-Block view, the future is pure potential—it doesn't exist—whereas the past is fixed actuality—not only does it exist, but we're stuck with it. Ongoing (i.e. present) events seem naturally placed between the potential of

[20] It is not entirely clear whether the property of *occurring* is supposed to be a *fundamental* property on Forbes' (2016) version of GBT—see especially Perović (2019, §3.2). However, given that Forbes provides no hint that the property is analysable on his view, we assume that it is intended to be taken as fundamental.

> the future, and the fixed actuality of the past; ongoing events are precisely those that have some fixed actuality (i.e. they have begun) and some potentiality (i.e. they are unfinished). A connection between activity taking place and the extrinsic properties of the latest bit of the block, located as it is between the open future and the fixed actuality of the past, is not such a surprising outcome…

In short, Forbes' explanation for why "activity is extrinsic" given GBT—i.e. why "a necessary condition on Φing is being succeeded by no events"—is that present events "have some fixed actuality (i.e. they have begun) and some potentiality (i.e. they are unfinished)". In particular, the reason why only present events possess the fundamental property of occurring is that in virtue of being present, they are located at the boundary between 'fixity' and 'potentiality'—i.e. between the fixed past and the open future.

We can see why Forbes' explanation above might satisfy some, but we can also see why it might be found unsatisfying: doesn't Forbes' explanation simply amount to the claim that only present events are located at the time than which there is no later—i.e. at the present time? Moreover, Forbes' explanation does not seem to adequately address the following question: given that according to his GBT, past events do not undergo any *intrinsic* change when they become past ("each event has persisted, intrinsically unchanged, since it came into existence" (ibid, 704)), how can it be that they are not also occurring? For example, if the Battle of Borodino has exactly the same intrinsic fundamental properties as it had when it was succeeded by no events, how can it not be happening?[21]

One way for GBTers to respond to these worries is to follow Deasy (2015, 281) in holding that "ordinary predicates [express] temporary relational properties defined in terms of presentness", or more carefully, that for each property F expressed by an ordinary predicate, there is a permanent relation R such that F is the temporary (more specifically, non-sticky) property of bearing R to a present time. Call this thesis *About Presentness*:

> ABOUT PRESENTNESS: For each property F expressed by an ordinary predicate, there is a permanent relation R such that F is the non-sticky property of bearing R to a present time.

On this view, for example, to sit is to bear the permanent *sitting-at* relation to a present time, and to have mass n is to bear the permanent *mass-of-n-at* relation to a present time. Given About Presentness, GBTers can respond to the worries concerning Forbes' view as follows: first, the reason why only present events possess the property of occurring is that *what it is* for an event e to occur is for e to *occur at a present time*. Second, although it is true that past events such as the Battle of Borodino stand in all of the fundamental relations to times in which they stood when they were present, they have changed in all sorts of profound ways: for example, the

[21] Perović (2019, §3.2) raises a similar worry. We develop a distinct but related objection to Forbes' view in Sect. 3.1 below.

Battle of Borodino is no longer a battle, and perhaps not even an event.[22] Therefore the fact that past events are no longer occurring does not seem so surprising. Finally, GBTers who accept About Presentness can argue that given that to believe that *p* is to bear the permanent *belief-that-p-at* relation to a present time (from About Presentness) and that the property of being present is a non-sticky property of times (from GBT), it follows that the property of *believing that p* is a non-sticky property. But if the property of *believing that p* is non-sticky, the property of *closely believing that P* is also non-sticky, and therefore premise (3) of the Safety Argument is false.

We have looked at two ways in which GBTers can argue that the property of *closely believing that P* is non-sticky, and therefore that premise (3) of the Safety Argument is false. It should be clear that MSTers can make similar moves. For example, an MSTer inspired by Forbes' view could argue that on her view, the unique temporary fundamental property is not presentness (as per Spotlight), but rather the property of events of *occurring*—and that for a time *t* to be present is just for *t* to be the (unique) time at which events are occurring.[23] It follows that given MST only present events are occurring, and therefore given that belief requires activity, that the property of *believing that p*—and hence the property of *closely believing that P*—is temporary. Alternatively, an MSTer could follow Deasy (2015) in combining Spotlight with About Presentness, and argue that to *believe that p* is just to bear the permanent *belief that p-at* relation to a present time. Again, in that case MST entails that the property of *believing that p*—and hence the property of *closely believing that P*—is temporary.

3 Objections

We have described two ways in which 4D A-theorists can reject premise (3) of the Safety Argument: by following Forbes (2016) in positing a fundamental temporary property of *occurring* such that only present events are occurring; or by following Deasy (2015) in embracing About Presentness, so that *what it is* to have a belief that *p* is to bear the permanent *belief that p-at* relation to a present time. In this section we address the question of whether these strategies are successful. As we have seen, the strategies generate four views: Forbes' (2016) GBT; a Forbes-inspired version of MST; Deasy's (2015) MST; and a Deasy-inspired version of GBT. In this section, we argue that each of these views either remains vulnerable to the original Safety Argument (Sect. 3.1) or to a revised version of the argument (Sect. 3.2). We conclude that for 4D A-theorists, hazardous (epistemic) conditions persist.

[22] Although it is not usual to treat eventhood as a temporary property, it is clearly open to the defender of About Presentness to argue that to be an event is just to bear the *event-at* relation to a present time.

[23] Note that this analysis of presentness (as a property of times) in terms of occurrence does not seem to be available to Forbes. It is essential to GBT that for a time *t* to be present is just for *t* to be the time than which there is no later ('the last slice of the block'); but it is not the case that for a time *t* to be the time than which there is no later is just for *t* to be the time at which events are occurring.

3.1 The Permanence/Stickiness of Belief

We have seen that 4D A-theorists of all kinds may resist the Safety Argument by rejecting premise (3) on the grounds that on their view, the property of believing that *p* is a temporary property. Now, the view that belief is temporary is certainly (on the face of it) *consistent with* GBT and MST. However, the fact that the view is strictly consistent with GBT and MST is not by itself a good reason to accept it. We can still ask: is it *plausible* that belief is temporary given the underlying metaphysical commitments of GBT and MST? In this section we press the case that it is not.

In order to see this, suppose we are *B-theorists*[24]: that is, we accept that (1) reality contains a four-dimensional spacetime manifold in which concrete objects and events are permanently located; (2) times are hyperplanes; (3) there is no perspective-independent present time; and (4) all fundamental properties—and therefore all properties—are permanent. In that case, we accept that e.g. given that there *used to be* dinosaurs, there *are* dinosaurs located at some (relatively) past time *t*1; and given that Napoleon *did believe* that he is present, Napoleon *believes* that he is present at some (relatively) past time *t*2.

Now suppose we posit a new fundamental property of quarks—call it *glow*—such that all and only the quarks located at a certain time *t*3 later than both *t*1 and *t*2 glow. It is clear that this will not lead us to deny that e.g. (relatively) past dinosaurs are dinosaurs, or that Napoleon believes that he is present. Now suppose we add that it is not just the quarks located at *t*3 that glow, but that *everything* located at *t*3 glows—and that nothing located at any other time glows. Again, we have no reason to deny that (relatively) past dinosaurs are dinosaurs, or that Napoleon believes that he is present. But suppose further that we are also 'spacetime relationalists' who identify hyperplanes (i.e. times) with the fusions of things located at them.[25] In that case, *t*3 is identical to the fusion of all of the things located at *t*3, and the fundamental property of glow is a property of exactly one thing, namely, *t*3. Still we have no reason to deny that (relatively) past dinosaurs are dinosaurs, or that Napoleon believes that he is present.

Finally, suppose we say that *t*3 just happens to be *this* time, and that the fundamental property of glow is an instantaneous property of times, possessed by each time in turn—i.e. that for any time *t*, if *t* glows then it never was and never will be the case that *t* glows, and that for any time *t*, it is sometimes the case that *t* glows. This would not lead us to deny that (relatively) past dinosaurs are dinosaurs, or that Napoleon believes that he is present. After all, why should it? The fact that e.g. this time glows and later times *will* glow makes no difference at all to the intrinsic natures of dinosaurs located in the (relative) past or to Napoleon.[26] All that changes

[24] Thank you to Theodore Sider (in correspondence) for suggesting this approach.

[25] *Relationalism* (about spacetime) is, roughly, the view that spacetime points and regions reduce to the objects and events located at them; the competing view is (spacetime) *Substantivalism*, according to which spacetime points and regions exist independently of the objects and events located at them. See Nerlich (2003) for an overview of the issues.

[26] We return to the question of how we should conceive of objects' *intrinsic natures* given the 4D A-theory in Sect. 3.2 below.

for *them* is the relations they bear to the glowing time: in particular, they are located at times that *used to* glow, and the time that *now* glows is later than the times at which they are located.

But now consider the point we have reached: the view that we have imagined accepting is simply Deasy's (2015) MST, but with the name 'presentness' for the unique temporary fundamental property *F* replaced with the name 'glow'. Given that whether we call *F* 'presentness' or 'glow' should make no difference to our judgements concerning whether (relatively) past dinosaurs are dinosaurs, or whether Napoleon believes that he is present, it seems we must accept that *given MST*, past dinosaurs are dinosaurs, and Napoleon believes that he is present. But if MST entails that Napoleon believes that he is present, it is not the case that given MST, for a subject S to believe that *p* is for S to bear the *belief that p-at* relation to a present time. In that case, we should accept that MST is, after all, vulnerable to the Safety Argument.

The 'thought experiment' described above was used to motivate the idea that given the underlying metaphysics of Deasy's (2015) MST, the property of believing that *p* is a *permanent* rather than a temporary property. And it is easy to see how it could be modified to motivate the idea that the property of believing that *p* is sticky given a Deasy-inspired version of GBT, and therefore that that view also remains vulnerable to the Safety Argument. Indeed, if anything the case is even more compelling for the Deasy-inspired version of GBT. Suppose we start out as B-theorists, as above, but then add that this time is the time than which there is no later—i.e. the 'edge of the block universe'—and that reality 'grows' as time passes, in the sense that, as time passes, new hyperplanes are added to the manifold, so that which time is the time than which there is no later changes. Given that we began by accepting that e.g. Napoleon believes that he is present, we have no reason to deny that Napoleon believes that he is present. After all, why should the facts that this time is the edge of the block universe and that the block universe grows make any difference to whether (relatively) past subjects have beliefs? In particular, neither fact makes any difference to the intrinsic natures of (relatively) past subjects. And nor should it make any difference whether we call the time than which there is no later 'the edge of the block' or 'the present time'—that is merely a terminological matter.

What about Forbes' (2016) GBT, and the Forbes-inspired version of MST? All that is required in order to make the analogous case against those views are some simple amendments to our original story: instead of starting with the B-theory and then imagining that our newly-discovered temporary fundamental property of *glow* just happens to be possessed by everything located at this and only this time, we imagine that all and only events located at this time happen to glow. But then the view we are imagining is simply the Forbes-inspired version of MST, but with the name 'occurring' for the unique temporary fundamental property *F* of events replaced with the name 'glow'. If we imagine in addition that this time is the time than which there is no later, and that reality 'grows' as time passes (in the sense that as time passes, new times are added to the manifold), then the view we are imagining is simply Forbes' GBT. The crucial point, as above, is that whether we call *F* 'occurring' or 'glow' should make no difference to our judgements concerning whether e.g. Napoleon believes that he is present; and therefore it seems we must

accept that given either the Forbes-inspired version of MST or Forbes' GBT, Napoleon believes that he is present, and more generally, that belief is permanent/sticky.

We can imagine Forbes, or a Forbes-inspired MSTer, responding to the above argument as follows: it is false to say that when we imagine an otherwise 'B-theoretic' view according to which all and only events located at this time possess the unique temporary/non-sticky fundamental property of glow, what we are imagining is exactly the Forbes-inspired version of MST, or—if we imagine in addition that this time is the time than which there is no later—Forbes' GBT. The reason is that there is an important difference between the temporary fundamental properties of *occurring* and *glow*: in particular, times at which events do not glow may or may not be times at which there is activity, and therefore at which subjects have beliefs, but times at which events are not occurring *cannot* be times at which there is activity, and therefore cannot be times at which subjects have beliefs. In short, given the relevant connections between occurrence, activity (and also, perhaps, causation—see Forrest 2004, 359) and belief, the property of glow—which does *not* bear these connections—is *not* like the property of occurring.[27]

Although we are somewhat sympathetic to this response, we note that there is a sense in which it begs the question against the original argument: the point of the relevant versions of the glow 'thought experiment' is exactly to cast doubt on the idea that given an underlying 'B-theoretic' metaphysics on which e.g. the fundamental physical properties of events are permanent/sticky, subjects located at times at which events do not possess the temporary/non-sticky fundamental property of *occurring* lack beliefs. But perhaps it is of the nature of the dialectic here that 'begging the question', in the sense of arguing from premises which in some sense assume the falsehood of one's opponent's view, is unavoidable—such debates are not uncommon in metaphysics. In any case, we do not take the arguments of this section to be utterly decisive against the 4D A-theory, and nor do we assume that they will convince every committed 4D A-theorist. Our goal is simply to give voice to the best case against the 4D A-theorists' rejection of premise (3) of the Safety Argument.

3.2 The Return of the Safety Argument

In the previous section we argued that given their other commitments, 4D A-theorists should concede that the property of *believing that p* is a permanent/sticky property. The argument of this section is directed more specifically at Deasy's (2015) MST and the Deasy-inspired version of GBT described above, according to which, given About Presentness, to believe that p is to bear the permanent *belief that p-at* relation to a present time. The argument is straightforward: by distinguishing

[27] Both Deasy and a Deasy-inspired GBTer could make an analogous response in defence of their own views, by arguing that it is of the nature of *presentness* (unlike *glow*) that it bears the relevant connections to properties such as believing that p. It should be clear how what we say in what follows would apply to this response.

between the ordinary tensed facts and the metaphysically perspicuous facts that underlie them, we can raise a version of the Safety Argument against such views.

We begin by noting that on the relevant versions of the 4D A-theory, ordinary past-tensed facts (and for defenders of MST, both past- and future-tensed facts) 'factor' into (1) permanent facts concerning objects and their relations to times, and (2) temporary facts concerning presentness.[28] For example, according to such views, the ordinary tensed fact *that Napoleon believed that he is present* 'factors' into (1) the permanent fact *that there is a time t such that Napoleon bears the believes that p-at relation to t*, and (2) the temporary fact *that t was present*. As Sider (2017, 790) puts it in relation to MST:

> The only distinctively A-theoretic part of the traditional spotlight view [MST] concerns the existence and motion of the spotlight [presentness]. Its intrinsic conception of objects in time (of their nature and how they change), setting aside time itself, is purely B-theoretic.

Now, such 4D A-theorists will naturally resist the claim that their view delivers a 'purely B-theoretic conception' of objects' 'intrinsic natures'. In particular, they will respond to the above by arguing that given their view, presentness plays an essential role in accounting for objects' intrinsic natures. For example, suppose it is now the case that Obama is laughing—it is part of Obama's present intrinsic nature that he is laughing. Such 4D A-theorists will point out that on their view, what makes it the case that Obama is laughing is that Obama is laughing at a present time—so if this time *weren't* present, Obama would *not* have the intrinsic nature that he in fact has. However, according to Sider (2017, 791), the claim that presentness plays an essential role in accounting for objects' present intrinsic natures given MST is ambiguous:

> [Given MST] the spotlight [presentness] is needed to secure my present intrinsic nature in the de dicto sense of securing what my nature is at the present time, but not in the de re sense of securing what my nature is at a certain time *t*, which is in fact the present time.

If Sider is correct, there remains a good sense—i.e. the '*de re*' sense—in which given the relevant version of MST, objects have their intrinsic natures independently of which time is present. And of course, the same point applies to the Deasy-inspired version of GBT: on that view, presentness—that is, the property of *being the time than which there is no later*—is required in order to secure my nature at the present time, but not my nature at a certain time *t*, which is in fact the present time.

By focusing on objects' intrinsic natures in Sider's '*de re*' sense, we can develop a new version of the Safety Argument against such 4D A-theories which cannot be avoided by a commitment to the claim that to believe that *p* is to bear the permanent *belief that p-at* relation to a present time. For example, consider the facts *that we believe that we are present* and *that Napoleon believed that he is present*. Given

[28] As noted by Sider (2017, 790, fn.2).

such 4D A-theories, the fact *that we believe that we are present* 'factors' into a permanent fact and a temporary fact:

(1) There is a time *t* such that we believe-at-*t* that we are present.
(2) *t* is present.

Similarly, the fact *that Napoleon believed that he is present* 'factors' into a permanent fact and a temporary fact:

(3) There is a time *t** such that Napoleon believes-at-*t** that he is present.
(4) *t** was present.

Thus given such 4D A-theories, the *metaphysically perspicuous* facts—i.e. the facts concerning ours and Napoleon's intrinsic natures '*de re*' and the distribution of fundamental presentness—are (1)–(4) above. But now we can ask: given that the vast majority of subjects across time (such as Napoleon) who believe *in relation to times* that they are present believe so falsely, isn't it a matter of exceptional luck that our belief *in relation to this time* that we are present is true? In other words, if we focus on the metaphysically perspicuous facts rather than on the truth of tensed natural language sentences, versions of the 4D A-theory according to which to believe that *p* is to bear the permanent *belief that p-at* relation to a present time are vulnerable to the following version of the Safety Argument (where '*n*' names this time):

(1) For any time *t* and subject S, S knows-at-*t* that p only if S's belief-at-*t* that p is *safe* (i.e. there are no close possible situations in which S's belief-at-*t* that p is false).
(2) Our belief-at-*n* that we are present is not safe, as there are close possible situations—i.e. certain possible situations in which *n* is not present—in which our belief-at-*n* that we are present is false.

Therefore

(3) We do not know-at-*n* that we are present.

Such 4D A-theorists will naturally respond to this argument by claiming that what really matters are knowledge and belief *simpliciter*, not knowledge and belief *in relation to times*; and given their views, our belief *simpliciter* that we are present is safe, and therefore our knowledge *simpliciter* that we are present is secure. However, remember that for such 4D A-theorists, knowledge and belief *simpliciter* are *relational* properties: to know that *p* is to *know-at-a-present-time that p*, and to believe that *p* is to *believe-at-a-present-time that p*. And of course, such 4D A-theorists are free to interpret the predicates 'knows that *p*' and 'believes that *p*' so that given their views, the sentence 'We know that we are present' is true. But our point is that when we focus on the metaphysically perspicuous epistemic facts—i.e. the facts concerning subjects' intrinsic epistemic states—we see that given such 4D A-theories, we

do not know *in relation to this time* that we are present. It follows that those who care about securing our knowledge that we present in the metaphysically perspicuous sense should reject such versions of the 4D A-theory.[29]

References

Barbour, J. (1999). *The end of time: The next revolution in physics*. London: Weidenfeld & Nicholson.

Bourne, C. (2002). When am I? A tense time for some tense theorists? *Australasian Journal of Philosophy, 80,* 359–371.

Braddon-Mitchell, D. (2004). How do we know it is now now? *Analysis, 64,* 199–203.

Braddon-Mitchell, D. (2013). Fighting the zombie of the growing salami. *Oxford Studies in Metaphysics, 8,* 351–361.

Briggs, R., & Forbes, G. (2017). The growing block: Just one thing after another. *Philosophical Studies, 174,* 927–943.

Broad, C. D. (1923). *Scientific thought*. Abingdon: Routledge.

Button, T. (2006). There's no time like the present. *Analysis, 66,* 130–135.

Button, T. (2007). Every now and then, no-futurism faces no sceptical problems. *Analysis, 67,* 325–332.

Cameron, R. (2015). *The moving spotlight*. Oxford: Oxford University Press.

Correia, F., & Rosenkranz, S. (2013). Living on the brink, or welcome back, growing block! *Oxford Studies in Metaphysics, 8,* 333–350.

Crisp, T. (2007). Presentism and the grounding objection. *Noûs, 41,* 90–109.

Deasy, D. (2015). The moving spotlight theory. *Philosophical Studies, 172,* 2073–2089.

Dorr, C., & Goodman, J. (2019). Diamonds are forever. *Noûs*. https://doi.org/10.1111/nous.12271.

Forbes, G. (2016). The growing block's past problems. *Philosophical Studies, 173,* 699–709.

Forrest, P. (2004). The real but dead past: A reply to Braddon-Mitchell. *Analysis, 64,* 199–203.

Kaplan, D. (1979). On the logic of demonstratives. *Journal of Philosophical Logic, 8,* 81–98.

Markosian, N. (2004). In defence of presentism. *Oxford Studies in Metaphysics, 1,* 47–82.

McTaggart, J. M. E. (1927). *The nature of existence* (Vol. 2). Cambridge: Cambridge University Press.

Mellor, D. H. (1998). *Real time II*. Abingdon: Routledge.

Merricks, T. (2006). Good-bye growing block. *Oxford Studies in Metaphysics, 2,* 103–110.

Miller, K. (2019). The cresting wave: A new moving spotlight theory. *Canadian Journal of Philosophy, 49,* 94–122.

Nerlich, G. (2003). Space-time substantivalism. In M. J. Loux & D. W. Zimmerman (Eds.), *The Oxford handbook of metaphysics* (pp. 281–314). Oxford: Oxford University Press.

Perović, K. (2019). Three varieties of growing block theory. *Erkenntnis*. https://doi.org/10.1007/s10670-019-00123-4.

Pritchard, D. (2005). *Epistemic luck*. Oxford: Oxford University Press.

Russell, J. (2015). Temporary safety hazards. *Nous, 51,* 152–174.

Sider, T. (2001). *Four-dimensionalism: An ontology of persistence and time*. Oxford: Oxford University Press.

Sider, T. (2017). Ross Cameron's the moving spotlight. *Analysis Reviews, 77,* 788–799.

Skow, B. (2009). Relativity and the moving spotlight. *Journal of Philosophy, 106,* 666–678.

Skow, B. (2015). *Objective Becoming*. Oxford: Oxford University Press.

Sosa, E. (1999). How to defeat opposition to Moore. *Philosophical Perspectives, 13,* 137–149.

Tallant, J. (2007). There have been, are (now), and will be lots of times like the present in the hybrid view of time. *Analysis, 67,* 83–86.

Tallant, J. (2011). There's no future in no futurism. *Erkenntnis, 74,* 37–52.

Tooley, M. (1997). *Time, tense and causation*. Oxford: Oxford University Press.

[29] We are very grateful to Universitas 21 for providing support for this project. We also thank UCD School of Philosophy, UCD Global, William Mulligan, Elaine Cregg, Özün Çentinkaya, Kerry Langsdale, and the Department of Philosophy at the University of Nottingham.

Weisberg, J. (2015). Formal epistemology. In E. N. Zalta (Ed.) *The Stanford encyclopedia of philosophy* (Winter 2017 Edition). https://plato.stanford.edu/archives/win2017/entries/formal-epistemology/.
Williamson, T. (1997). Knowledge as evidence. *Mind, 106,* 1–25.
Williamson, T. (2000). *Knowledge and its limits*. Oxford: Oxford University Press.
Williamson, T. Justifications, excuses, and skeptical scenarios. In J. Dutant & F. Dorsch (Eds.), *The new evil demon*. Oxford University Press, Oxford (forthcoming).
Zimmerman, D. (2005). The A-theory of time, the B-theory of time, and 'taking tense seriously'. *Dialectica, 59,* 401–457.