

The Personalized A-Theory of Time and Perspective

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Abstract

A-theorists and B-theorists debate whether the “Now” is metaphysically distinguished from other time slices. Analogously, one may ask whether the “I” is metaphysically distinguished from other perspectives. Few philosophers would answer the second question in the affirmative. An exception is Caspar Hare, who has devoted two papers and a book to arguing for such a positive answer. In this paper, I argue that those who answer the first question in the affirmative – A-theorists – should also answer the second question in the affirmative. This is because key arguments in favor of the A-theory are more effective as arguments in favor of the resulting combined position, and key arguments against the A-theory are ineffective against the combined position.

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1 Introduction

In a series of unconventional but lucid works, Caspar Hare has laid out and defended a theory of *egocentric presentism* (or, in his more recent work, *perspectival realism*), in which a distinguished individual's experiences are *present* in a way that the experiences of others are not (Hare, 2007, 2009, 2010). Closely related ideas appear in the writings of others. One example is Valberg (2007)'s notion of the "personal horizon," especially considering his discussion of "the truth in solipsism" and his insistence that "my" horizon is really "the" (preeminent) horizon. Merlo (2016)'s "subjectivist view of the mental" is arguably even more closely related; he argues that "one's own mental states are metaphysically privileged vis-à-vis the mental states of others" and discusses in detail the relationship of his view to Hare's. As another example, in a review of "The Character of Consciousness" (Chalmers, 2010), Hellie (2013) argues that this work fails to do justice to the *embedded point of view* aspect of consciousness. He illustrates this with what he calls a "vertiginous question": why, of all subjects, is *this* subject (the one corresponding to the human being Benj Hellie) the one whose experiences are "live"? In other work (Conitzer, 2019), I explore whether the "liveness" of one particular perspective is a *further fact* – a fact that does not follow logically from the physical facts of the world – by considering the analogy to looking in on a simulated world through a virtual reality headset: besides the computer code that determines the physics of the simulated world, there must be additional code that determines which simulated agent's perspective to show on the headset.

In any case, Hare's exposition of these ideas is clearest for the present purpose, so I will focus on it. In an effort, possibly with limited success, to avoid misrepresenting his position,

as well as to clarify the relation to other work, let me introduce my own terminology. Let us refer to the theory that states that there is a metaphysically (rather than merely epistemically) distinguished¹ *I* (or *Self*²) as the α -theory. The intent is to emphasize the analogy with how the A-theory (McTaggart, 1908) states that there is a metaphysically distinguished *Now*.³ Similarly, I will refer to the theory that contradicts the existence of any metaphysically distinguished *I* as the β -theory. Hare is thus defending the α -theory. It is not entirely clear to me whether the specific version he defends is intended to be analogous to presentism (or actualism – I will refrain from discussing modality in this paper, but the parallels between time/subjectivity and modality are well recognized (Prior and Fine, 1977; Bergmann, 1999)), or rather to something like a spotlight theory (or possibilism). In fact, his writing suggests different answers to this question in different places, and I will not attempt to resolve this small mystery here.

Others have commented on the idea of a metaphysically distinguished *I* – or, similarly but not equivalently,⁴ a metaphysically distinguished *Here* – in the context of the philosophy of time. (While the differences between a metaphysically distinguished *I* and a metaphysically distinguished *Here* will not matter for some of the arguments presented in this paper, it is useful to note that, in the context where a distinguished *I* is combined with a distinguished *Now*, the combination of these two immediately implies a distinguished *Here* as well – namely, the location of the distinguished individual at the distinguished time.⁵) However, they have usually dismissed it rather quickly, in order to move on with the case of a metaphysically distinguished *Now* (whether or not they support the latter). For example, Zimmerman (2005, page 422) writes:

An egocentric analogue of actualism (‘personalism’, to steal and abuse a term) is very hard to imagine. Perhaps there is some kind of not-merely-epistemological solipsism

that would qualify. In any case, only the maniacally egocentric could be this sort of personalist.

Further back, Williams (1951, page 458) writes:

Perhaps there exists an intellectualistic solipsist who grants the propriety of conceiving a temporal stretch of events, to wit, his own whole inner biography, while denying that the spatial scheme is a literal truth about anything. Most of the disparagers of the manifold, however, are of opposite bias. Often ready enough to take literally the spatial extension of the world, they dispute the codicil which rounds it out in the dimension of time.

Fine (2005) treats the case of first-personal realism in detail, but advocates for adopting a non-standard variety of realism, either taking reality to be relative to a standpoint, or (his preferred option) considering it to be fragmented.⁶ He notes:

It has seemed evident that, of all the possible worlds, the actual world is privileged; it is the standpoint of reality, as it were, and the facts that constitute reality are those that obtain in this world. On the other hand, if we ask, in the first-personal case whether we should be a nonstandard realist (given that we are going to be first-personal realists in the first place), then the answer to most philosophers has seemed to be a clear 'yes'. It has seemed metaphysically preposterous that, of all the people there are, I am somehow privileged - that my standpoint is *the* standpoint of reality and that no one else can properly be regarded as a source of first-personal facts. The case of time is perplexing in a way that these other cases are not.

I believe that there is value in exploring the α -theory more thoroughly, rather than dismissing it summarily for being repugnant in one way or another. The words “egocentrism” and “solipsism” are both loaded with too much baggage. While “egocentric,” taken literally, aptly describes the α -theory, the common interpretation of the word carries various negative connotations, and it is not clear to me that these are fair to apply to every possible α -theorist. Just as A-theorists can take great interest in times other than their own (otherwise why would they bother to write papers?), the α -theorist can presumably take great interest in people other than herself.⁷ The relation to solipsism is also not obvious. Hare intends for his theory to be only a weak and subtle version of solipsism that does not deny the existence of others’ consciousness (Hare, 2009, pages 41-46), and others have granted him as much (e.g., Smith (2011), and Mark Johnston in the introduction to Hare (2009)).⁸

Indeed, a key point is that, just as there are multiple versions of the A-theory, there are also multiple versions of the α -theory, and these vary in the status they accord to other individuals. Perhaps more importantly – and this is the main focus of this paper – something is lost when attempting to study the A vs. B question separately from the α vs. β question; the two are very much interrelated. To illustrate this, consider a theory that allows a distinguished *I* that is not alive at the time of the distinguished *Now*, thereby treating the two types of distinction as independent. Many of the arguments that I give in what follows would do little to support such a theory. Hence, in what follows I will not take the α A-theory – the label that I will use for a view that combines the α -theory with the A-theory – to allow this possibility; what I have in mind is that a single (*living-*)*person-stage* is distinguished. This interrelation is relevant to the previous point. For example, the α A-theorist may accord to other persons the same metaphysical status as she does

to herself in past and future time slices.

After presenting, for the sake of illustration, some versions of the α A-theory (Section 2), I will argue that key arguments that have been given to support the A-theory support the α -theory just as well, and in fact support the combined α A-theory especially strongly (Section 3), placing the onus on the β A-theorist to explain why she accepts the A-theory but not the α -theory. (It would seem that most A-theorists, at least publicly, are β A-theorists in my terminology.) Specifically, in 3.1 I will discuss the argument from presence *simpliciter*, and in 3.2 the argument from the appropriateness of sentiments such as those expressed by “Thank goodness that’s over!” I will also argue that some serious challenges that the β A-theorist faces are much less problematic for the α A-theorist (Section 4). Specifically, in 4.1 I will discuss the argument from special relativity, in 4.2 the argument that the direction of time may be a local matter, in 4.3 the argument that asks for the rate at which time passes, and in 4.4 the argument from time travel and Gödelian universes.

Overall, my main objective is to argue that the α A-theory is superior to the β A-theory.⁹ I would similarly argue that the α A-theory is superior to the α B-theory, but I do not expect many to defend the latter view.¹⁰ This would leave the α A-theory and the β B-theory as the remaining candidates. The reader might expect that my next step will be simply to argue that the α -theory is so unappealing that we should accept the β B-theory, and hence, *a fortiori*, the B-theory. However, I believe that that conclusion is too hasty; an effective discussion of the relative merits of the α A-theory and the β B-theory requires arguments of a different type than what I will present here. So, I will be content to let both theories stand for now.

2 Some versions of the α -theory

The A-theory counts among its supporters presentists, moving-spotlight theorists, and growing-block theorists. Can we conceive of similar distinctions among α -theorists? Rather than studying this in isolation from the A vs. B question, it seems more enlightening to ask what natural versions of the α A-theory there are. (Common versions of the A-theory and the B-theory can straightforwardly be reinterpreted as versions of the β A-theory and the β B-theory.) I will present some versions in this section. My aim here is not to defend specific versions or to reach any definitive conclusion about which version is best. I also make no claim that this list is exhaustive, though I believe that it includes the versions that are most natural to discuss in the context of the existing literature on the A-theory. The aim of this exercise is merely to clarify some aspects of the α A-theory and prevent overly narrow interpretations of it. Moreover, it will be helpful to refer to some of these versions in what follows. I will also contrast these versions with some scenarios from the literature.

- **Personalized presentism.** This is the most natural way to adapt presentism into an α A-theory. In this version, there is a single distinguished individual whose experience at a single distinguished point in time is, in some sense, “present.” (I hope that the intended meaning of “presence” is at least somewhat clear at this point; I will discuss it in more detail in 3.1.) Beyond this present experience, nothing exists. Or, perhaps, some part of the outer world can be granted some type of existence; but other experiences do not exist. However, presumably, the present experience can change (more on this below), just as presentists typically consider it possible for the Now to change.

- **Personalized moving spotlight.** As in the classical moving-spotlight theory, a spotlight moves over the four-dimensional block universe, except now this spotlight shines on a single individual (or that individual's experience) at a single point in time. For the personalized moving spotlight, it is less obvious how it moves (more on this below).
- **Personalized growing block.** In the classical growing block theory, time slices are added to the block that contain all the events in the universe at that point in time. In the personalized growing block theory, only those parts of spacetime are added that are experienced by a distinguished individual (and, perhaps, their past light cones).

Every one of these versions of the αA -theory leaves several possibilities for *how* the point of present experiences – the “I-Now” – could change or move (if it changes or moves at all).¹¹

These include the following variants:

- **Single individual overall.** The I-Now moves along with a single individual throughout his or her lifetime. It is never associated with any other individual.
- **Changing individual (αA -reincarnation).** At the end of the distinguished individual's lifetime, the I-Now jumps to another individual. We can consider various subvariants. For example: (1) the I-Now cannot jump backwards in time; (2, a relativistic subvariant) the I-Now can jump anywhere that is outside of all the past light cones of points in spacetime that the I-Now occupied earlier; (3) the I-Now can jump anywhere it has not previously been; (4) the I-Now is not constrained in where it can jump.¹²
- **Rapidly changing individual.** The I-Now can jump from one individual to another even before the former's demise, and then jump back to the previous individual as well. We can

consider the same subvariants as for α A-reincarnation.

It is admittedly odd to propose all these different versions of the α -theory without making any serious attempt to justify them individually or to claim to be exhaustive.¹³ Again, my goal in doing so is merely to illustrate some of the possibilities that the theory leaves open. The availability of multiple distinct interpretations should not be surprising given the analogy and interrelation with the A-theory. It is also clear that some of these versions are much more solipsistic than others, or, at least, fit the negative connotations of solipsism more than others.

Moreover, in earlier work on theories resembling the α -theory, scenarios are often sketched that fit much better with some of these versions than with others. Usually, this is done without much discussion of why the author prefers such a version or even of what the alternatives might be. This has the effect of opening up the theory to criticisms that another version of the α -theory might have avoided. Consider the following passage by Hare (2009, page 51) (discussing a thought he had as a child), corresponding to a single-individual-overall theory:

Isn't it amazing and weird that for millions of years, generation after generation of sentient creatures came into being and died, came into being and died, and all the while there was this absence, and then one creature, CJH, unexceptional in all physical and psychological respects, came into being, and POW! Suddenly there were present things!

Later on, Hare (2009, page 83) considers a type of reincarnation:

Is it necessary that only one person ever have present experiences? Again, the natural thing is to say no. Egocentric presentism gives me conceptual resources to imagine

being one sentient creature, and then, later, being another sentient creature. So (recall Nagel's "fantasy of reincarnation without memory") I can imagine that, after a lifetime of oblivious egg consumption, I die a happy philosopher, then find myself in a cage eighteen inches tall by twelve inches wide, my beak clipped to its base. This need not involve imagining that CJH dies a happy philosopher and then becomes a battery chicken. It may only involve imagining that after CJH's death there are again present experiences, and they are the experiences of a battery chicken. Once again this is a real, real nasty, metaphysical possibility.

So "the one with present experiences" is a definite description that may be satisfied by different things at different times. Like all such descriptions, it behaves as a *temporally nonrigid referring term*.

Similarly, Valberg (2013, page 366) writes:

We can, however, give sense to the possibility that a human being other than JV in the past was "me," or that a human being other JV [sic] might be "me" in the future. That is, it makes sense experientially (as a way things might be or develop from within my experience) that, in the past, a human being other than JV occupied the position at the center of my horizon, or that a human being other than JV will occupy this position in the future.

Again, the main point here is to make clear how many possibilities the α -theory leaves open and thereby to prevent overly specific interpretations. The discussions in the remainder of the paper generally apply to all of the above versions of the α A-theory. A reader who wants to

keep just a single version in mind might focus on, for example, personalized presentism or a personalized moving spotlight theory, with a single individual overall.

3 Revisiting arguments in favor of the A-theory

In this section, I will revisit some well-known arguments in favor of the A-theory. 3.1 concerns the argument from presence *simpliciter* and 3.2 concerns the argument from the appropriateness of sentiments such as those expressed by “Thank goodness that’s over!” In both cases, the argument will be shown to support the α A-theory more strongly than the β A-theory, because the argument supports a distinguished *I* just as it supports a distinguished *Now*. Whether these arguments are indeed effective against the B-theory is not the topic of this paper, so I will not review responses that B-theorists may give to these arguments here.

3.1 Presence *simpliciter*

Arguably the most basic argument in favor of the A-theory is that of “the presence of experience.” Many have made such an argument; a good exposition of one is given by Balashov (2005). The argument is that my current experience of writing this paper is *present* (or *occurs*¹⁴) in a way that my going through security at the airport yesterday is not present. This is not to be taken as a relative statement; everyone will agree that the writing experience at 5:50pm on March 18, 2019 is present **at 5:50pm on March 18, 2019** in a way that the airport security experience at 8:15am on March 17, 2019 is not present **at 5:50pm on March 18, 2019**. Rather, the writing experience seems present in an *absolute* sense that does not require the boldface phrases, and this is referred

to as presence *simpliciter*.

I argue that, if we are to entertain such a notion, for it to be at all palatable, it must be personalized, for the following reason. Just as my earlier airport security experience is not present *simpliciter*, neither is David's experience of eating breakfast in Australia present *simpliciter*, even if this event happens to take place at the same time.¹⁵ Let me first attempt to explain what I mean by this, and then argue for it. In order to clarify what I mean, it is tempting to write that David's breakfast experience is not present *simpliciter to me*. But to do so would undermine the argument, in the exact same way that it would undermine the purely temporal version of the argument to say that my airport security experience is not present *simpliciter right now*. In the latter sentence, "*simpliciter*" is clearly at odds with the indexical "**right now**." The exact same is true about the juxtaposition of "*simpliciter*" and "**to me**." If an experience takes place *simpliciter*, then to capture this we should not add any relativizing indexical phrases.

Moreover, it seems that only an experience can be present *simpliciter* in this way.¹⁶ For example, it is not at all clear to me what it would mean for a chair to *itself* be present *simpliciter*. My *experience* of a chair – visual, tactile, and the result of significant cognitive processing – can be present *simpliciter*. Such an experience is the kind of thing that can have the "liveness" that past and future experiences do not, and that others' experiences do not. But I cannot imagine what it would mean for the chair to *itself* be "live" in this way. If we are willing to be a bit loose with our language, in most cases it will not cause confusion to, as a shorthand, say that the chair is present *simpliciter* when we really mean to refer to my experience of the chair. But if we are being strict, the experience is not the chair itself. Moreover, it seems that an experience can only be had by a single person¹⁷ at a single time,¹⁸ and it does not seem that two distinct experiences,

corresponding to different individuals and/or times, can be co-present *simpliciter* in this way. So, if anything, the argument would suggest the existence of a metaphysically distinguished (I, Now) pair.

Is this argument equivocating between “presence” in the temporal sense and “presence” in the experiential sense? Indeed both meanings of the word seem to play a role, and I believe that this is revealing rather than misleading. Insofar as the current moment in time has a “liveness” that other moments do not, it has it only through my own experience; the same moment elsewhere, even if experienced by someone else, lacks this liveness just as a past moment here, even if experienced by me, lacks it. In this way, the two meanings of the word are inextricably linked. Hare (2009, page 100) similarly argues that it is in fact advantageous that the word “present” has multiple readings.

It is also important here not to be misled by how we use language. The sentence “David is eating breakfast” is, in a sense, simpler than “I went through airport security yesterday morning.” Both sentences explicitly refer to their subject (“David” and “I”), but only the latter needs to explicitly refer to when the event took place (“yesterday morning”) in order to place it in time. So the first sentence has a type of simplicity that the second one lacks; we could add “now” to the former, but it is not needed. On the other hand, dropping “I” from the second sentence leaves it grammatically mangled. From this asymmetry between “I” and “now” one might be tempted to conclude that the word “simpliciter” more naturally corresponds to what is happening *now* – since the word “now” is usually not needed for sentences concerning the present – than it would correspond to what is happening to *me* – since a word such as “I” or “me” is usually needed for a sentence concerning the first person.

However, I would argue that the significance of this asymmetry is not metaphysical, but rather entirely linguistic. So many of our spoken sentences concern the present that, pragmatically, it would be inefficient to require adding a word like “now” to all these sentences. On the other hand, usually a conversation concerns multiple actors, so it is important to make it clear who is the subject in each sentence. To make this clear, consider a different context: my planner. In my planner, I write entries such as “attend faculty meeting at noon.” It would be an inefficient use of my time to add “I” (or “I will”) to the beginning of the sentence, because I would have to do so for almost every entry in my planner! In contrast, naturally, each of my planner entries *must* have a time associated with it; after all, if the event were happening right now, I would not have to add an entry to my planner. So, in the context of my planner, the roles that subject and time play in the pragmatic issue at hand are reversed: the former is generally implicit but the latter is not.¹⁹ This appears to confirm that the asymmetry is due to pragmatic reasons.

3.2 The appropriateness of wanting things to (not) be past

Another well-known argument (Prior, 1959; Zimmerman, 2007) in favor of the A-theory (and presentism in particular) concerns the appropriateness of statements such as “Thank goodness that’s over!” Here, “that” might refer to something like a headache the speaker was experiencing. It is often argued that the B-theory does not provide the resources to capture the full significance of this statement. Prior argues that the meaning of such a statement is not that it is good that the headache takes place at a point in spacetime earlier than the point at which the statement is uttered; in his words, “Why should anyone thank goodness for that?” Instead, what the statement is getting at is that the headache is simply *over*, and the A-theory provides the resources to

capture this. But one might similarly argue in favor of the α -theory, for example appealing to the appropriateness of statements such as “Thank goodness that is not happening *to me!*” This is closely related to the question of whether self-bias could be metaphysically justified, as studied by Hare (2007, 2009). The β A-theorist is likely to complain that the analogy is not apt, because the second statement merely reflects a selfish disposition rather than something more fundamental. It is not clear to me why the same could not be said of the first statement, that the statement merely reflects the speaker’s callousness towards her past self. To avoid this criticism, perhaps one can make the first statement about someone else (“Thank goodness John’s headache is over!”), but, and I believe this is telling, the argument seems to lose force with this move.

Let us explore this in a bit more depth. Suppose all headaches last exactly one or two days with no ill effects afterwards, and consider the following two statements:

S_1 : Thank goodness John’s headache, which started yesterday, ended yesterday as well, rather than continuing into today.

S_2 : Thank goodness John’s headache, which started the day before yesterday, ended the day before yesterday as well, rather than continuing into yesterday.

Here, we imagine caring a great deal about John and preferring him not to suffer. Under the β A-theory, one would expect S_1 to have a significance not shared by S_2 , as the former concerns a difference in what is happening *now*, whereas the latter concerns a difference that is in any case entirely in the past. It is not clear to me that such a difference in significance is really there. Is it not just as reasonable to appreciate that John did not suffer yesterday, as it is to appreciate that he is not suffering today?

Yet, one may have an intuition that indeed, S_1 has a significance that S_2 does not. I believe that the likely grounds for this intuition are not germane to the issues under discussion here, and we can modify the scenario to remove these grounds. First, in the first situation, if John were still having a headache, I might feel compelled to try to *do* something to alleviate his suffering. However, this is easily addressed by postulating that it is common knowledge that I can do nothing of the sort. Second, if John is in my immediate environment and I see him suffering, this may cause me to suffer as well, for example due to the mirror neurons in my brain. But this is merely returning us to an example where I myself suffer, which is precisely what we were trying to avoid by introducing John. Hence, we should postulate that John is somewhere else entirely.

To make all this concrete, suppose that John has decided to go on a two-month retreat in a faraway country. He will not communicate until he gets back. Halfway into his retreat, I realize that around this time of year, he always gets a headache, which may last one or two days. I care for him and so I hope that it is just a one-day headache this time. But I will not find out until he comes back and tells me. Imagining this scenario, I do not find myself concerned specifically about whether his headache happens to be taking place right now, or not.²⁰

Hence, given that the scenario is set up appropriately, I remain unconvinced that there is any significant difference between S_1 and S_2 , and this seems to deal a blow to the βA -theory. Naturally, the βB -theory avoids this blow; but I believe the αA -theory also avoids it, in that John today is just as much “outside the I-Now” as John yesterday, because I am not John. In fact, compared to the βB -theory, the αA -theory does a better job explaining why something about the example seems to change when I myself am brought into it. That is, if we replace “John’s” with “my” in the statements above to obtain S'_1 and S'_2 , then it does seem that S'_1 has a significance that

S'_2 does not. S'_2 is not an unreasonable statement – it makes sense to appreciate having suffered less than one might have, just as it makes sense to appreciate someone else suffering less than he might have – but only S'_1 concerns the immediate presence or absence of suffering, which is the vivid characteristic that imbues “Thank goodness that’s over!” examples with their intended significance.²¹

Indeed, both Suhler and Callender (2012) and Greene and Sullivan (2015) report on an experimental study by Caruso et al. (2008) in which subjects were asked what would be fair compensation for a particular task. The study found that when subjects were asked to imagine themselves doing the task in the future, they felt that they should be compensated significantly more than when they imagined themselves doing the task in the past; but this effect disappeared when they were asked to imagine someone *else* doing it. Suhler and Callender (2012) take this to invalidate the “Thank goodness that’s over” argument, and Greene and Sullivan (2015) argue for complete temporal neutrality in making decisions. (The argument for temporal neutrality is worked out in detail in Sullivan (2018). Hurka (1996, page 61) argues that temporal neutrality is appropriate for certain non-hedonic goods, but is convinced that it is not for avoiding pain, by the example from Parfit (1984, page 165) that we would prefer a more painful operation in the past to a less painful one in the future.) The analysis above suggests that while indeed, the results of the Caruso et al. study cast doubt on whether the “Thank goodness that’s over” argument effectively supports the βA -theory, they are perfectly consistent with this argument supporting the αA -theory.

4 Revisiting arguments against the A-theory

In this section, I will revisit some well-known arguments against the A-theory. 4.1 concerns the argument from special relativity, 4.2 concerns the argument that the direction of time may be a local matter, 4.3 concerns the argument that asks for the rate at which time passes, and 4.4 concerns the argument from time travel and Gödelian universes. In all cases, the α A-theory will be shown to avoid most of the bite that these arguments inflict on the β A-theory, roughly because the arguments hinge on the fact that the Now is global in nature – that is, it stretches across all of space. Because the I-Now is local in nature, the arguments are ineffective against the α A-theory.

4.1 Special relativity

Einstein's theory of relativity has often been invoked to criticize the A-theory. Unlike in a Newtonian universe, in the special theory of relativity, simultaneity is not absolute; rather, whether two events are simultaneous depends on the reference frame. But if there is no absolute simultaneity, then how can there be an absolute Now? Special relativity can also be used to cast doubt on specific arguments in favor of the A-theory – or at least, the β A-theory. For example, let us modify the example from 3.2 by putting John on a faraway planet, so that whether his headache is earlier or later than our own time depends on the reference frame. This seems to make it difficult to hold the position that, in order to know how we should feel about John's headache, it is important to know whether it is in the past or in the future. Now, perhaps there may still be a separate, absolute sense in which John's headache is in the past, even if this is not implied by the theory of relativity. But if there is not, this poses a problem for using the "Thank goodness that's over!" argument in

support of the βA -theory – but, importantly, not for using it in support of the αA -theory, because, as discussed in 3.2, in that case the argument is only made about one’s own pains rather than those of someone on a faraway planet. Still, we must investigate the implications of relativity for the αA -theory more broadly.

Some (e.g., Markosian (2004)) have argued that, in fact, a philosophically austere version of the theory of relativity could explain the empirical evidence without implying that there is no absolute simultaneity. The relation of absolute simultaneity could be added on top of the theory of relativity. For example, one might suppose that there exists a distinguished frame of reference that determines which events are absolutely simultaneous. Positing such a distinguished frame seems a rather awkward and inelegant addition to the theory, one that is rather contrary to the spirit of the theory of relativity and perhaps more in line with older theories of a stationary aether. But, Zimmerman (2007) has argued that such an addition to the physical theory is no different in kind from the addition of a distinguished Now in the first place. That may be so, but it is a further addition, and it seems that, for the sake of parsimony, each addition should at least count against the resulting theory. The analogy is also imperfect. It can at least be argued that we know when the Now is; in contrast, it is not clear whether and how we could ever know what the distinguished frame of reference is. Zimmerman (2011) discusses and responds to all these concerns in far more detail than I can do here, and argues well that they are not fatal to the βA -theory, but it is clear that at least they pose significant challenges.

In any case, the above arguments only concern the βA -theory. In the αA -theory, there is no need for any observer-independent simultaneity at all. While the Now in the βA -theory must be global – in the sense that everywhere in the universe, there are events happening Now, thereby

introducing an observer-independent simultaneity relation across all of space – the I-Now in the αA -theory is local. The precise nature of this locality – for example, whether the I-Now is spatially extended – does not matter much for the arguments at hand; what matters is that the I-Now is associated with an observer, and that that observer can be localized in spacetime. Specifically, this ties the I-Now to the frame of reference associated with that observer;²² if so desired, simultaneity could be determined based on this frame of reference according to the theory of relativity. For that matter, no notion of simultaneity across space is even required for the theory to make sense. While the βA -theory necessitates such a notion – whatever is happening Now across space must be simultaneous, in an objective sense – it does not seem to pose any problem for the αA -theorist to hold that there is no absolute notion of simultaneity. As far as the αA -theorist is concerned, we can define a notion of simultaneity for convenience, for example the one based on the theory of relativity and the distinguished frame of reference corresponding to the I-Now as just suggested, but none is truly needed. In fact, the problems that the theory of relativity poses for the A-theory have already led to at least one proposal similar to the αA -theory, namely Skow (2009)'s relativistic spotlight theory,²³ in which the spotlight shines locally, not globally.²⁴

4.2 The direction of time

For any version of the βA -theory in which time flows, there needs to be an objective *direction* in which time flows. Presumably, it flows from what we perceive as the past to what we perceive as the future. But if the laws of physics are invariant to time reversal, then these laws do not naturally provide such a direction. It is commonly held that what we perceive as the direction of

time is tied to the entropy gradient, and that this entropy gradient may well be reversed in other parts of spacetime. If so, we may imagine a Doppelgänger being that is otherwise very much like ourselves, living its life in such a part, backwards in time from our perspective (Williams, 1951; Maudlin, 2002). The Doppelgänger would presumably think that *we* have it backwards, that the direction of time's flow is opposite from what we think it is. So what gives us reason to believe that we are the ones to have it right? A key issue here is that presumably, the βA -theory requires time to flow in the same direction everywhere; the direction should be *globally* consistent.²⁵ It has been argued that we have no reason to believe that the Doppelgänger even has mental states at all, by virtue of the fact that the way its life proceeds is so unlike the way ours proceeds (Maudlin, 2002). But this seems a rather odd conclusion, since we have supposed that, *mutatis mutandis* for the difference in direction, the Doppelgänger's life is entirely like ours. For a more detailed discussion of this point and these issues more generally, see Price (2011) and references cited therein.

In contrast, the putative existence of persons living in parts of spacetime with a reversed entropy gradient, living their life backwards in time (from our perspective), poses no problem for the αA -theory. This is because the I-Now is inherently *local* (in both a spatial and a temporal sense), so it does not matter if the entropy gradient is reversed elsewhere; all that matters is what the entropy gradient is *here* (and *now*), because that is what determines the direction in which the I-Now moves. If the I-Now actually tracks a Doppelgänger at some point, it does not appear to pose any problem for the theory for it to then move in the opposite direction. (This may pose problems for some of the specific illustrative versions presented earlier in Section 2, but it poses no problem for the other versions.) We can view *external* time as nothing more than a dimension

through which the I-Now travels.

Taking this to an extreme, we may even imagine a machine that transports you to another region of space where the entropy gradient is reversed relative to ours, and that transforms you into a Doppelgänger there. You will, in some sense, continue your life there uninterrupted, except moving in the opposite temporal direction. Of course being transported to another region of space is likely to be a bit shocking; but, if such scenarios are possible at all, there seems to be no reason to believe that your experiences will be any different than they would have been if you had been transported instead to a region of space that happens to have the same entropy gradient (and not been transformed into a Doppelgänger). Accommodating this intuition is easy under the α A-theory; for example, the I-Now could simply jump along with you and then start moving backwards (from our initial perspective). On the other hand, this example appears problematic for versions of the β A-theory that require a globally defined direction of time, because such a theory would have to conclude that one of the two halves of your life is lived, in an *absolute* sense, backward. If we believe Maudlin (2002)'s argument, we would then conclude that you had real mental states in only half of your life. This seems to be an odd conclusion. If near the end of your life you were transported back to the original spacetime region, the suggestion that you had not had any real mental states since the original transportation event would seem utterly bizarre to you!

4.3 The rate of time's passage

Opponents of the A-theory (or β A-theory) have also criticized it as follows: if the Now moves, what is the rate at which it moves? It has been argued that if one says that it moves at 1 second

per second, this poses a problem for the theory, because one can cancel the units of seconds and conclude that the rate is simply 1, and (supposedly) 1 is not a rate (e.g., Olson (2009)). Now, the idea that a unitless rate is not a rate is simply nonsense. This has been convincingly argued elsewhere: Skow (2011) uses the example of sociologists tracking what the “most common birth year” in the population is. One would expect the most common birth year to generally increase by roughly 1 year every year, though the rate may be higher or lower than 1 depending on demographic phenomena. In any case, the rate is unitless (one might just as well say the rate is approximately 1 decade per decade). The example is convincing to me, and clearly many other examples of sensible unitless rates can be provided. One such example is particularly relevant here: due to relativity, satellites and astronauts on the International Space Station age at a slightly different rate than objects and people on the surface of the Earth. The amount of time that such a satellite or astronaut experiences per unit of Earth surface time is a unitless rate.²⁶ This example actually seems to pose a more serious problem for the answer that time moves at “1 second per second” – if the idea is to think of time as moving globally rather than just locally, then in just *whose* seconds are we measuring this rate? In any case, a weaker version of the original criticism seems to hold up: the question only allows uninformative answers. The answer that it moves at “1 second per second” seems tautological. We could instead introduce the concept of *supertime* to track the Now’s motion through time, so that at different points in supertime, the Now is at a different time. (For a detailed discussion of the metaphor of supertime, see Skow (2012).) Then, we can ask how many seconds pass per supersecond. However, there seems to be every reason to simply define the supersecond so that the answer becomes “1 second per supersecond,” which remains uninformative.

In the αA -theory – or, at least, in versions of it where the I-Now moves along with a person through time (see Section 2) – the question of how fast the I-Now moves does not pose such problems. First, the fact that on a space station, a different amount of time is experienced to pass no longer poses any problem, because the I-Now is local, so there is no requirement that time passes at the same rate everywhere. Moreover, the question of how fast the I-Now moves can have more interesting answers. In the relativistic example above, it is natural to respond that the I-Now moves at a different rate when it is associated with an astronaut in orbit than it does when it is associated with a person on the surface. Alternatively, let us put relativity aside for a moment and focus on the I-Now’s experiential aspect instead. One might reasonably hold that the I-Now moves through external (i.e., clock) time at a different rate when it is associated with a person who is under anesthesia than it does when it is associated with someone who is highly alert.

If we allow ourselves to speculate, a computational²⁷ theory might be used to unify these two examples: consider a person’s “clock speed” – the number of mental operations, according to some suitable definition, per (Earth surface) second – and take this to determine the rate at which the I-Now moves. Specifically, let us define a supersecond so that there is always exactly one mental operation per supersecond. Then, the number of (Earth surface) seconds per supersecond – which is just the reciprocal of the clock speed defined above – will vary in the different scenarios above, in a way that conforms with our intuitions. Focusing on Earth surface seconds per supersecond (regardless of the location of the person) simultaneously addresses both the relativistic and the experiential components of the scenarios, and also allows us to handle mixed cases, such as a space station inhabitant who is under anesthesia. In such a case, the number of mental operations per Earth surface second can be written as the number of mental operations per

space station second, multiplied by the number of space station seconds per Earth surface second, thereby separating out the experiential and relativistic components, respectively. This shows that these two components are compatible. Per the theory of relativity, there is nothing special about Earth surface seconds, as opposed to space station seconds or Mars surface seconds; they are just different ways to measure external time.

Supertime, so defined, perhaps more naturally corresponds to our sense of passage, leaving regular time (as tracked by clocks) in the more modest role of a dimension through which we happen to pass, as noted earlier. That is, this notion of supertime would allow us to give metaphysical meaning to the idea of time passing more or less quickly from a subjective viewpoint. Of course, this view may conflict with other intuitions that we have developed. In our ordinary experience of time, relativistic issues do not come into play, and our waking experience of how fast time passes is usually fairly stable. Given this, we tend to conceive of time as objective, and treat any variance in how we perceive its passage as a mere error in estimation. For the current purpose, I believe such intuitions are misleading. The following two examples are intended to illustrate that it is in fact quite natural to assign primary importance to the notion of supertime as defined here. In each of them, we will imagine a choice between two alternatives that result in you having different amounts of time but equal amounts of supertime left in your life. I argue that you should be (close to) indifferent between the options in both scenarios.

Example 1. It is the year 2400, and you are part of a group of people on a lifelong space voyage. The group is about to split up into two subgroups that will take separate spacecraft. It is common knowledge that the two subgroups will never communicate again, either with each other or with the people left on Earth. You get to choose in which subgroup you will be. They

are indistinguishable, except the two spacecraft will move to orbits around different massive bodies, with different relativistic time dilations. If you choose to be on spacecraft 1, your life will therefore be shorter in Earth time than it would be on spacecraft 2. As a result, your first reaction may be that you would prefer to be on spacecraft 2. But, I argue, upon closer inspection there is little reason for this. This is because, to make up for the shorter amount of Earth time in your life on spacecraft 1, correspondingly more events will happen per unit of Earth time on spacecraft 1. You would experience entirely similar lives on the two spacecraft, with equally many interesting events taking place on both. If it were possible to communicate from Earth to the spacecraft, you might prefer being on spacecraft 2 because (for example) more papers, books, and movies would be produced on Earth and sent to spacecraft 2 for your consumption during your life. But we have assumed that such communication is impossible. As far as I can see, there does not seem to be any compelling reason to have a preference about on which spacecraft you continue your voyage.

Example 2. It is again the year 2400, but this time we will stay on the surface of the Earth. After a long and happy life, you have regrettably contracted an incurable disease that, if left untreated, will kill you almost immediately. Unfortunately, the only possible treatments will put you in a type of comatose state until your death. You will, however, have wonderful dreams in this state. Due to secrecy issues, your friends and family will never be made aware of your predicament. There is no chance at all that any new treatment will become available during the remainder of your life. You have a choice between medications M_1 and M_2 . Compared to M_1 , M_2 would keep you alive for twice as long, but would allow your brain to process at only half the rate. Your first reaction may be that you would prefer to receive M_2 . But again, I argue, upon

closer inspection there is little reason for this. Because of the difference in brain processing rates, you would have equally many wonderful dreams under the two medications. If your friends and family could visit you in your comatose state, you might prefer for them to have that option for a longer or shorter period of time, but we have ruled this out. If you had hopes that scientists could develop a cure, you would prefer M_2 to give the scientists more time, but we have also ruled this out. As far as I can see, there does not seem to be any compelling reason to have a preference about which medication you receive.

In summary, to the extent that the question about the rate at which the Now moves poses a problem for the β A-theory, it does not pose this problem for the α A-theory, since for the latter the answer to the question need not be tautological.

4.4 Time travel and Gödelian universes

A final criticism of the (β) A-theory is that it does not make much sense of time travel scenarios. Following Lewis (1976), it seems natural to distinguish between *external* time and the time traveler's *personal* time. But if one takes external time seriously in the metaphysical sense, as would be expected of a β A-theorist, it would appear one cannot simultaneously do the same for personal time. This, in turn, necessitates unintuitive attitudes towards time travel. The following passage by Sider (2005, page 333) illustrates this perfectly.

But if personal time bears little similarity to external time then “personal time” is merely an invented quantity, and is misleadingly named at that. That I will view a dinosaur in my personal future amounts merely to the fact that I once viewed a

dinosaur, and moreover that this is caused by my entry into a time machine. Since this fact bears little resemblance to the facts that constitute a normal person's genuine future, I could not enter the time machine with anticipation and excitement at the thought of seeing a dinosaur, for it is not true that I am *about* to see a dinosaur, nor is the truth much *like* being about to see a dinosaur. If anything, I should feel fear at the thought of being annihilated by a device misleadingly called a "time machine". The device causes it to be the case that I once viewed a dinosaur, but does not make it the case in any real sense that I *will* view dinosaurs.

Perhaps there is a way out of this conclusion for the βA -theorist, but I cannot see it. Or perhaps she is willing to bite the bullet and accept the conclusion that (at least backward) time travel is to be avoided at all cost. In any case, the αA -theorist avoids this issue. For her, personal time is what is taken seriously, and she can legitimately look forward to – if this is in fact something to look forward to – her encounter with a dinosaur.²⁸

Closely related to the issue of time travel is that of Gödelian universes that cannot be given a global temporal ordering. The theoretical possibility of such universes perhaps poses a problem for some versions of the βA -theory. The αA -theory, however, does not require any global temporal ordering. For versions of the αA -theory with a moving I-Now, one may yet worry if such universes do not create different problems. For example, Dieks (2006) discusses an example by Reichenbach (1958, pages 141-142) in which a person loops around to meet his earlier self again at a particular point in spacetime. Dieks, who argues for a B-theoretic notion of local becoming, argues that this example illustrates that even a local type of spotlight is problematic. He argues that when the spotlight shines on the region in spacetime where the younger and older

versions of the person meet, there must in fact be two distinct spotlights, one that will travel with the younger version and one that will travel with the older version. Then, the spotlight associated with the younger version loops around as that version becomes the older version, eventually reaching the same region again. By the same reasoning as before, we will again need two spotlights at this point. But the other spotlight, the one that was initially associated with the older version, is not available for the task, being meanwhile associated with an even older version. So we will need a third spotlight, and so on ad infinitum, which seems problematic.

But it is easy to find an escape from Dieks' argument. The fact that the two versions of the person are (roughly) at the same point in spacetime does not imply that the spotlight shines on them simultaneously *in the supertime sense*. That is, the "same" spotlight might earlier (in supertime) light up the younger version only (i.e., that version's experience at that point) and later (in supertime) the older version only. Hence, there is no need to introduce additional spotlights when the meeting point is reached. This illustrates one advantage of associating the spotlight with person-stages (I-Now) rather than with small regions of spacetime (Here-Now): even though the younger and the older version are both in (roughly) the same location at the same time, they correspond to different person-stages. This requires, of course, that in this type of scenario we associate the I-Now with a person-stage (where a younger and an older version of the same person at the same time are still considered separate person-stages), rather than with a pair of a person and a time, which in this case might pick out both person-stages. This interpretation of the I-Now in any case aligns better with the other arguments presented in this paper. For example, it seems hard to imagine the (simultaneous) presence *simpliciter* of the *combination* of both person-stages. Also, the older person-stage may think, looking at the younger person-stage, "Thank goodness I

am no longer that immature!” The idea that the spotlight was previously (in the supertime sense) associated with the younger person-stage and now with the older person-stage seems to capture the significance of this statement well. Finally (and more speculatively), if we imagine the brain of the older stage to have slowed down and no longer to be processing at the rate of his younger self, associating the I-Now with person-stages would allow us to say that the I-Now moves at a different rate with respect to external time when associated with each of these two person-stages.

5 Conclusion

Upon inspection, key criticisms of the A-theory are only effective as criticisms of the βA -theory, and key arguments in favor of the A-theory are much more convincing as arguments for the αA -theory. To the extent I have succeeded in showing that A-theorists are rationally compelled to be α -theorists as well, surely many will interpret this as a significant blow to the A-theory because they consider the α -theory implausible. Nevertheless, some philosophers may well be willing to adopt some version of the αA -theory (Hare being an obvious example). As I emphasized earlier, a detailed discussion of the relative merits of the αA -theory and the βB -theory is outside the scope of this paper. Such a discussion is sure to revisit many familiar arguments in the philosophy of time and modality (and mind), and is unlikely to reach a swift conclusion.²⁹ I do hope to have convinced the reader that the αA -theory will fare better in such a comparison than the βA -theory. The former has an internal consistency that allows it to escape some of the more damaging criticisms to which the latter has fallen prey.

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Notes

¹Throughout the paper, I will be deliberately noncommittal about the exact nature of such metaphysical distinction. The reason is that the arguments presented here do not depend on what this distinction consists in. In the analogous case of a metaphysically distinguished *time* (rather than a metaphysically distinguished subject), by not committing to any particular interpretation, I can simultaneously address all varieties of A-theorists – presentists, moving-spotlight theorists, growing-block theorists, etc. – even though they disagree about the exact nature of the *Now*'s metaphysical distinction. Of course, there is disagreement even about how to define the individual varieties. Deasy (2017) discusses this at length, and proposes to define each of the main varieties as the conjunction of the A-theory (which he takes to mean “There is an absolute, objective present instant”) and a proposition about whether things begin and/or cease to exist. For example, for the growing-block theorist, that proposition is “Sometimes, something begins to exist and nothing ever ceases to exist.” While the distinctions between the various definitions are significant, again, my aim is to steer clear of this debate here and stick to arguments that work for any of these definitions. The same is true for the case of a metaphysically distinguished subject.

²Again, what exactly the distinguished entity is – a human being, a brain, an experience – is not essential to my arguments, so I will remain deliberately noncommittal.

³Is a commitment to a distinguished *Now* what defines the A-theory, or is it a commitment to tensed facts? (And in the latter case, should the α -theory's defining commitment instead be to first-personal facts?) To the extent that these commitments are not equivalent, in this paper, I will stick with the commitment to a distinguished *Now* (or *I*), as others have done – e.g., Cameron (2015, page 89). For what it is worth, while a detailed analysis is outside

the scope of this paper, I believe that they are in fact equivalent. I believe that a distinguished *Now* implies tensed facts, such as the fact that today is July 3, 2019. The other direction is perhaps more controversial, but I believe it holds as well: tensed facts such as the fact that today is July 3, 2019 distinguish a specific time, to which we may refer as the *Now*. A theory such as fragmentalism (Fine, 2005) might be used to dispute the second direction: if we consider *all* tensed facts, including those for other times, then no specific time is distinguished. But, of course, the set of all tensed facts taken together is full of contradictions, as it also contains, for example, the fact that today is not July 3, 2019. Avoiding such contradictions means restricting attention to a consistent fragment – but this in turn distinguishes a specific time. For further discussion of problems that fragmentalism faces, see Cameron (2015, pages 86-102).

⁴For a discussion of the differences and their implications, in the related context of the Lewisian and Quinean accounts of centered worlds, see Liao (2012).

⁵The combination similarly implies a distinguished observational frame of reference corresponding to the distinguished individual's state of motion. All of this does, of course, require the distinguished individual to be spatially located and to move through time and space, rather than, say, an immaterial soul or something existing for only an instant.

⁶Lipman (2015) discusses fragmentalism in more detail.

⁷It should be noted here that, on the face of it, Hare (2007, 2009) does introduce his theory to justify placing greater weight on oneself than on others in making decisions. However, he also points out that the (distinguished) presence of an experience is only one factor in making decisions (“It is better that there be present suffering from a hangnail than absent suffering of leg-crushing.”). Perhaps more importantly, key examples that Hare uses in these works to support his theory are preferential in nature, such as an example where one knows that CJH (Hare) and Joe Bloggs have been in a train crash, CJH is about to have a painful operation, the subject knows he is one of these two but cannot remember which one, and so the subject hopes to not be CJH (Hare, 2007). Such preferential examples are quite helpful to illustrate and motivate these types of theories – similar ones can be given to motivate the A-theory, as Hare does and others have done before him – even if one does not wish to normatively endorse the

preferences used in the example. I will also discuss such examples later in this paper.

⁸Others have tried to distinguish between more and less defensible versions of solipsism along similar lines; a particularly notable example is Valberg (2007). Similar ideas also appear in Johnston (2010).

⁹Of course, to accept this conclusion, it is not necessary to agree with every single argument presented here.

¹⁰In fact, Hare (2009, page 48) writes that “If you think that theories that dignify a slice of history do not survive sustained critical inspection, then you can still be a four-dimensionalist egocentric presentist. Indeed, I find that an attractive position.” This may appear to put him in the α B-camp. However, on the whole in this section on the relationship to positions in the philosophy of time (Hare, 2009, pages 46-50), he is clear that egocentric presentism does not commit one to a particular view on time, while also stating that the moving-spotlight theory is the most analogous one. Elsewhere (Hare, 2010), he writes “If you find yourself sympathetic to [the central tense realist idea] then I recommend that you consider **going the whole hog**, and becoming a perspectival realist” (emphasis in bold mine), which might be interpreted to imply that perspectival realism is a stronger position than tense realism. In any case, as I hope will become clear from this paper, the α A-theory does not at all require a dignified *slice* of history.

¹¹The word “I-Now” sounds more mystical than I would like, but we will need such a word. The word “spotlight,” when interpreted as shining on a single individual’s experience at a single point in time, would give the right idea, except it seems to commit the discussion to a view that all of the four-dimensional spacetime block exists, but not all of it is illuminated. While I do not want to dismiss such a view, in what follows we will not require this as an assumption. In contrast, the awkward word “I-Now” does not seem to rule out any of the possibilities. (Similarly, Hellie (2013) uses “me-now.”)

¹²The last two subvariants seem more difficult to reconcile with the personalized growing block theory, and might also have negative implications for free will.

¹³For example, perhaps it is not even necessary for the I-Now to change only in a sequential manner as in these variants; perhaps it can change along multiple dimensions, corresponding to changes across time and changes across space or individuals. Skow (2009)’s relativistic moving-spotlight theory, in which individual points in spacetime are “lit up” from the perspective of points in *superspacetime*, seems very much in line with such a view. This also raises

important questions about how these dimensions interact: Is temporal change objective or subjective? Is subjectivity eternal or temporary? For related questions on the interaction of time and modality, see Dorr and Goodman (2019).

¹⁴Balashov (2005) uses “presence” and “occurrence” to refer to different concepts, but it seems to me that others have used “presence” to refer to a concept that is closer to Balashov’s “occurrence”. In any case, this latter concept is what I am after, and I hope that the use of “*simpliciter*” makes this clear.

¹⁵There is, of course, the question of what “at the same time” even really means given that in special relativity, simultaneity depends on the frame of reference. I will discuss relativity later; for the purpose of the current argument, we may assume a Newtonian universe.

¹⁶Merlo (2016, pages 326-327) makes a similar point.

¹⁷I use “person” here, and throughout, in a broad sense; presumably animals and perhaps artificial intelligence can similarly have experiences. Also, in common parlance, of course two people can “share an experience,” but I use “experience” here more narrowly in its phenomenological sense.

¹⁸Along the same lines, Hare (2009, page 49) describes the distinguished nature of his current experience and emphasizes that it is an easy-to-make “big mistake” to extend this to other current experiences. Hare (2010) presents an argument with strong similarities to the one presented here. Finally, at the end of his paper, Skow (2009) also discusses the vivid nature of present experiences and argues that a local spotlight shining on a single individual explains this just as well as a global one (though he does not argue that it actually explains it *better*).

¹⁹For additional discussion of the linguistic asymmetry between time and space, and how this asymmetry is driven by pragmatic concerns in communication, see Butterfield (1984).

²⁰In this example, there is nothing to synchronize John’s experience with mine; his life is unfolding in parallel to mine and it is hard to see why it would matter which events are contemporaneous. As we will discuss in 4.1, we can make the example even more extreme by having John fly far off into space somewhere, so that, as far as the theory of relativity is concerned, there really is no absolute answer to the question whether his headache is taking place at the same time as my current experience. If so, caring about simultaneity seems to require a very strong commitment to the β A-theory, as it requires that there be an additional fact about simultaneity over and above the theory of relativity

that is important for what we should care about, even though no physical measurement could ever tell us whether two events actually were or were not simultaneous in this sense.

²¹Some of this is reminiscent of Turri (2013)'s "That's outrageous!" example. Turri argues that just as the appropriateness of statements such as "Thank goodness that's over" can be used to support presentism, the appropriateness of statements such as "That's outrageous!" can be used to attack it, because it seems perfectly legitimate to be outraged by, say, a past genocide. I consider it telling that "Thank goodness that's over!" examples typically involve oneself and "That's outrageous!" examples typically involve others; this may well be what is driving the difference in conclusions from these examples.

²²The definition of what constitutes a frame of reference varies. Here, we consider a frame of reference to be determined purely by its state of motion, rather than to also include a coordinate system.

²³In earlier work, Stein (1968, page 18) hints at a similar theory when he contemplates what would result from an argument by Putnam (1967) if one tried to preserve a different intuition about the relationship between what is present and what is real. It is not clear whether he intends at all to defend such a theory.

²⁴Hare (2010) and Hare (2009, page 48) also make some of the points that I made in this subsection. Fine (2005, 2006) similarly gives a detailed discussion of what, for the realist, should replace the role of times when we take into account special relativity, and concludes that most plausibly frame-time pairs should take their role, in combination with a nonstandard type of realism in which either realities are indexed to different frame-times or reality is fragmented.

²⁵The Now is not localized under the β A-theory, so that there is a single Now across space; but if it moves in one direction in one location and in the opposite direction elsewhere, it is hard to imagine that after moving in these opposite directions it remains the *same* Now across these locations.

²⁶One might counter that these conditions in fact correspond to different units, namely Earth surface seconds and ISS seconds, so that we in fact do not obtain a unitless rate. But this misses the point that a second denotes the same amount of aging for the people in each condition. The unitless rate indicates how much faster people in one condition age than those in the other, and for this comparison no units are needed. Similarly, we need no units to

say that one person is 1.2 times as tall as another. That the rate being unitless is meaningful is further illustrated by the fact that it can be both above and below 1, because of the opposing effects of relative velocity time dilation and gravitational time dilation; there is an orbit, about half the radius of the Earth above the surface, at which the rate is 1 (Ashby, 2002). The rate being 1 at this orbit is not just a meaningless consequence of how we defined the units; it is the orbit at which astronauts age equally fast as those on the surface.

²⁷It is important to hold a sufficiently broad view of “computation” here; such broad views are common among those working on the theory of computation. Alternatively, and less ambitiously, the reader may just view this as a suggestive analogy to the clock speed of a computer.

²⁸Well, she may still hesitate, to the extent that it is not obvious that the presence of experience, the I-Now, will follow her through the time machine rather than go somewhere else. As an example that illustrates this ambiguity, it may be one of these unmarketable time machines that also leave behind a badly burned body, apparently alive for a few more seconds, where the traveler entered the time machine. (See Hare (2009, page 58) for a similar example.) But at least her believing that it will follow her back in time (rather than transitioning to a different person at the same time, or staying with a burnt body) would not cause any inconsistency with her other beliefs.

²⁹This seems all the less likely given that the problem connects to other challenging problems, such as the Sleeping Beauty problem – see, e.g., Conitzer (2015).

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