**Temporal Dynamism and the Persisting Stable Self**

**Abstract**

Empirical evidence suggests that a majority of people believe that time robustly passes, and that many also report that it seems to them, in experience, as though time robustly passes. Non-dynamists deny that time robustly passes, and many contemporary non-dynamists—deflationists—even deny that it seems to us as though time robustly passes. Non-dynamists, then, face the dual challenge of explaining why people have such beliefs and make such reports about their experiences. Several philosophers have suggested the *stable-self explanation*, according to which what partly explains one or both of the explananda is that people believe themselves to have a stable persisting self which is imagined either as moving through time, or as being stationary, with time moving around it. This paper empirically investigates this explanation. We found, however, no evidential support for the stable-self explanation, leaving the non-dynamist but also, we will argue, the dynamist, with an extant explanatory challenge.

**1. Introduction**

One of the major divisions within the philosophy of time revolves around the question of whether time robustly[[1]](#footnote-1) passes. For the purposes of the paper, we will refer to the two opposing parties of the debate as dynamists and non-dynamists**[[2]](#footnote-2).** Call *dynamists* those who hold that time robustly passes, in the manner posited by A-theorists,[[3]](#footnote-3) such that there is some objective fact of the matter as to which events are present, and which events those are changes as time passes. Call *non-dynamists* those who deny that there is robust passage.[[4]](#footnote-4) Non-dynamists hold that there exist static relations of earlier-than, later-than and simultaneous-with, and that past, present, and future, have no special metaphysical status and are merely relative or perspectival: what is past relative to one event is future relative to another.

Non-dynamists face several explanatory challenges. The first is a challenge that arises due to the nature of people’s beliefs about time. The second is a challenge that arises due to people’s reports about how time seems to them to be, in experience. Let’s take each of these in turn.

First, some clarification is in order. When we say that someone *believes* that time robustly passes, we mean that the content of their representation of time is closer to a representation of time as dynamical than non-dynamical. Notably then, people’s beliefs about whether time robustly passes may be tacit. They may be unable to describe how they take time to be, and they may never have consciously tokened any thoughts about how they take time to be in this regard. Nevertheless, they are able to use their representations to make judgments about which world, dynamical or non-dynamical, is most like our world. If people judge that a dynamical world is most like our world (compared to a non-dynamical one) then we will say that they believe that time robustly passes.

There is robust evidence that a majority of people believe that time robustly passes (Latham, Miller and Norton 2019, 2020a, 2021; Latham, Miller, Tarsney and Tierney 2021; Hodroj, Latham, Lee-Tory and Miller 2023; Baron, Everett, Latham, Miller, Tierney and Oh ms). Latham Miller and Norton 2019, 2020a, 2021) used detailed vignettes that described a variety of different dynamical and non-dynamical worlds, and asked participants which they think is most like ours. They found that ~70% of people judge that some kind of dynamical world is most like ours. More recently, Hodroj, Latham, Lee-Tory and Miller (2023), replicated something close to that finding using simpler vignettes. They found that ~65% of people judge that our world is dynamical rather than non-dynamical. A further study by Baron, Everett, Latham, Miller, Tierney and Oh (forthcoming), probed people’s beliefs using animated diagrams. They found that ~75% of people judged that a dynamical diagram was most like our world.

A further matter about which there is empirical evidence is the extent to which people report that, in experience, it seems to them as though time robustly passes. Here, investigations have found that ~40% of people *strongly* agree that it seems to them as though time robustly passes (Latham, Miller and Norton 2020b, Shardlow, Lee, Hoerl, McCormack, Burns and Fernandes 2020) and that ~60% at least *weakly* agree that it seems this way.

According to non-dynamists, time does not robustly pass. Thus, in order to defend their view non-dynamists must explain why people *believe* that time robustly passes. Call this *the belief explanandum*. They also need to explain why, if time does not robustly pass, people report that it seems to them as though it does. Call this the *reported experience explanandum.*

There are four broad classes of candidate explanations that non-dynamists have offered in this regard. The first is the *experiential explanation.* The second is the *open-future explanation.* The third is the *replaced-experiences explanation.* The fourth is the *persisting-self explanation*.

According to the experiential explanation, we experience time as passing, and this explains why we report that it *seems* this way (the reported experience explanandum): for it does indeed seem this way. In turn, this can be used to explain the belief explanandum, by noting that we often come to believe that our world is some way, on the basis of its seeming to us to be that way.

The experiential explanation is a natural explanation for *passage illusionists* to accept. Passage illusionists hold that people are subject to a pervasive perceptual illusion as of time robustly passing.[[5]](#footnote-5) If people are subject to such an illusion, then it can be no surprise that (a) they come to report that this is how things seem to them and (b) that on that basis they come to believe that this is how things are. One problem, however, is that due to difficulties in spelling out how we could be subject to such an illusion, many non-dynamists are not passage illusionists.[[6]](#footnote-6) Instead, these non-dynamists endorse *passage deflationism*.

Deflationism comes in many varieties, but importantly, deflationists hold that we do *not* have experiences as of time robustly passing. Clearly, then, deflationists cannot appeal to the experiential explanation to explain *either* explananda. However, the open-future, replaced-experiences, and persistence-self explanations are all candidate explanations to which the deflationist can appeal.

According to the *open-future explanation* our representing the future as open, and the past closed, explains both the belief and the reported experience explanandum (Ismael 2012, 2017; Prosser 2016; Hodroj, Latham, Lee-Tory and Miller 2022). According to this view, people represent the past as *objectively* fixed and the future as *objectively* open*.* That is, they represent that the fixedness/openness of states of affairs is not merely a perspectival matter, but is metaphysically objective. Of course, we represent *different* states of affairs as open and as closed depending on the time at which we are doing the representing. At later times people represent *more* states of affairs as closed, and *fewer* states of affairs as open than at earlier times. The thought is that by representing that there is a *change* in which states of affairs are objectively open and which are objectively closed, people come to represent a privileged moment that stands ‘between’ the open and the closed states of affairs, and that which moment that is, changes as states of affairs that were open, become closed. Thus, people come to represent time as dynamical, explaining the belief explanandum. The reported experiences explanandum can then be explained by noting that people tend to interpret their experiences in line with their beliefs about the nature of time; hence people who believe that time robustly passes will tend to describe their experiences using concepts and language that are dynamical (Miller, Holcombe and Latham 2018). Thus, they will often come to report that it seems as though time passes, thus explaining the reported experiences explanandum.

Unfortunately, recent empirical investigation of several versions of the open-future explanation have failed to find any empirical support for the view (Hodroj, Latham and Miller ms; Hodroj, Latham, Lee-Tory and Miller 2023; Lathan and Miller 2023).

The third candidate explanation is the replaced-experiences explanation. According to this view, because people experience a change in *which* things they perceive, they come to falsely believe that time robustly passes. Here is how such a view might go. Sattig (2019a; 2019b) explores a view on which people’s sense of there being something flow-like or passage-like is their sense of *replacement* of their perceptual experiences.[[7]](#footnote-7) The idea, very roughly, is that people’s perceptual experiences of qualitative change are accompanied by a sense of replacement, and that this sense of replacement is grounded in the representation of replacement in the content of those experiences. That is, people’s experiences represent not just that things are thus and so at one time, and *differently* thus and so at other times, but also represent the ‘replacement’ of experiences with new experiences. Importantly, ‘replacement’ need not be a robustly dynamical notion. It need not involve representing that which experience is objectively present changes (Sattig 2019b). So, this view need not be committed to the idea that we have experiences as of robust passage. Instead, deflationists who opt for the replaced-experience explanation might argue that the (veridical) experience of replacement is misdescribed or misreported as being one as of robust passage, thus explaining the reported experience explanandum.

Here is one way that explanation might go. Hoerl (2018) argues that things presented to us in perceptual experience are not presented to us *as* present. What he means by this is that people’s perceptual experiences have no *temporal viewpoint*.[[8]](#footnote-8) By contrast, people’s perceptual experiences have a spatial viewpoint: they represent not only the spatial relations between the things that people are seeing, but also that they are seeing them from a particular location in space. While people can imagine perceiving the same things with the same spatial relations but from a different spatial viewpoint, they cannot imagine doing so from a different temporal viewpoint. So temporal viewpoint simply doesn’t find its way into the content of people’s experiences.

Then, according to this version of the replaced-experiences explanation people have experiences that (a) lack a temporal viewpoint, and (b) are represented as being replaced. In virtue of this, people mistakenly describe and report those experiences in dynamical terms. They do so because, first, they describe and report them in terms of there being some privileged set of experiences, those which they have at a time and which lack a temporal viewpoint, and second, because which experiences those are, changes. As a result, people come both to report having experiences as of time robustly passing, which explains the reported experiences explanandum, and to believe that time robustly passes, thus explaining the belief explanandum.[[9]](#footnote-9)

Finally, according to the persisting-self explanation, people come to believe that time robustly passes in virtue of the way they represent the self as persisting through time. According to this view people mistake their experiences of a persisting self for experiences as of robust passage, and this explains the reported experiences explanandum. In turn, this view can explain the belief explanandum by suggesting that people come to believe that time robustly passes on the basis of them falsely believing that it seems to them as though time robustly passes.

According to one version of the persisting-self explanation, people mistake an experience as of an enduring self as an experience as of robust passage, and on that basis come to report that it seems to them as though time robustly passes, and on the basis of that report, they come to believe that time does in fact robustly pass (Velleman 2006; Prosser 2007, 2012, 2016).

Recent empirical work by Baron, Latham, Oh and Miller (ms) on this version of the persisting-self explanation found no evidence to support the view. Baron et al. focussed on whether there is an association between people representing the self as *enduring* (as opposed to *perduring*) and believing that time robustly passes. They failed to find any such association, and concluded on that basis that the persisting-self explanation does not find empirical support. However, there is another version of the persisting-self explanation, the one we probe in this study.

Recent work by Gruber, Bock and Montemayor (2022) and Miller and Wang (2022) give rise to a new interpretation of Velleman and Prosser. This, in conjunction with existing empirical evidence, provides a good reason to revisit the persisting-self explanation. It may be, as Miller and Wang suggest, that when Velleman and Prosser talk about the self enduring, in part, they have in mind the idea that there is some core unchanging aspect to the self, which exists at multiple times.[[10]](#footnote-10) While the idea that there is an unchanging aspect of the self which persists through time might be thought to align rather better with an endurantist metaphysics, it is clearly consistent with a perdurantist one as well. Although according to perdurantists the temporal stages of a persisting person are *numerically* distinct, this in no way debars them from being qualitatively similar, or indeed, qualitatively identical. Thus, it could be that even perduring selves have (or fail to have) some qualitatively unchanging aspect of self. In this paper we are interested in the connection between beliefs about there being such a self, (remaining neutral on whether that self endures or perdures), and the belief that time robustly passes, on the one hand, and reporting that it seems as though time robustly passes, on the other.

One alternative version of the persisting-self explanation holds that people have experiences of a persisting self, and that many of these people believe that the self is *stable* in that they believe that *there is some core unchanging aspect of the self*. These people have what we will call *stable-self beliefs.* Importantly, in what follows when we talk about stable-self beliefs (and a stable-self) we mean the belief that there is some unchanging *aspect* of the self, not that the self, as a whole, is unchanging or stable.

According to what we will call the *stable-self explanation,*  in virtue of having these stable-self beliefs people tend to describe their experiences of a persisting self in dynamical terms, and as a consequence they come to report that it seems to them as though time robustly passes. In turn, people come to believe that time does robustly pass on the basis of their reporting that this is how things seem to them.

Then there are two versions of the stable-self explanation. According to the first of these, people who have a stable-self belief tend to describe these experiences in terms of the self moving through time. This aspect of the explanation is partly motivated by previous research, which shows that ~60% of people strongly agree that it seems as though the self moves through time (Latham, Miller and Norton 2020b). The non-dynamist will contend, then, that people have a veridical experience as of a persisting self, and that they misdescribe these experiences in terms of the self moving through time. On this version of the stable-self explanation such people tend to mistake their (veridical) experiences of a persisting-self, misdescribed in terms of the movement of that self, for experiences as of robust passage in which it is time, rather than the self, which moves. Call this version of the view *the moving-stable-self explanation.*

An alternative version of the stable-self explanation is that people who have a stable-self belief tend to misdescribe their experiences of a persisting self in terms of time moving around the self. But describing these experiences in this manner just is reporting that it seems as though time robustly passes. Call this the *moving-time-stable-self explanation.*

According to either version of the stable-self explanation such people will report having experiences as of time robustly passing. This explains the reported experienced explanandum. In turn, the belief explanandum can be explained by appealing to the fact that people (mistakenly) believe that it seems to them as though time robustly passes, and on this basis come to believe that time does robustly pass.

In the remainder of this paper, we empirically investigate both versions of the stable-self explanation. In the following section we outline this candidate explanation in more detail, and develop our hypotheses. In Section 3 we explain our methodology and results, before in Section 4 discussing the upshot of those results.

 **2. The Stable-Self Explanation**

All proponents of the stable-self explanation agree that people have veridical experiences of a persisting self, but disagree about whether we misdescribe those veridical experiences of a persisting-self as experiences as of a moving self (moving-self version), or as experiences as of time moving around the self (moving-time version). In what follows we aim to test both versions of the stable-self explanation.

There is, however, further scope for disagreement amongst proponents of the stable-self explanation. Such proponents might disagree about the content of the experiences of persistence: namely, on whether people have experiences as of a persisting stable-self, or merely as of a persisting self. On the former version of the view, people have experiences as of a *persisting stable-self.* Then, depending on whether the self is stable or not, those experiences will either be veridical or illusory. In either case we take it to be natural to say that the reason people come to believe that the self is stable is on the basis of having these experiences, be they veridical or not. On the latter version of the view, the content of our persisting-self experiences is not as of a persisting stable-self at all: it is simply as of a persisting self, and that people’s belief that the self is stable does not arise as a result of having experiences of the self being stable. Rather, on this view, insofar as people tend to describe their experiences of the self as being experiences as of a stable-self (if they do), then this will likely be because they believe that the self is stable.

In what follows we take no stand on the nature of people’s *experiences* of self. We make no assumption about whether people have experiences as of a stable-self or merely as of a persisting self, nor whether, if it is the former, these experiences are veridical or not.

Instead, we focus entirely on the nature of their *beliefs* about the self: namely whether they believe it to be stable or not. In part, this is because we take it to be easier to probe people’s beliefs about the self than their experiences thereof, and in part this is because any version of the stable-self explanation holds that people believe that the self is stable, and it is this that, in part, explains why they come to report that they have experiences as of robust passage, and, in turn, why they come to believe that time robustly passes, and to report that they have experiences as of time robustly passing. We want to test the most abstract version of the view, so we focus on people’s beliefs about the self.

Bearing all this in mind then, if *any* version of the stable-self explanation is right, then we should find an association between people believing that there is a stable-self, and reporting that it seems to them as though time robustly passes. We should also find an association between people believing that there is a stable-self, and believing that time robustly passes. Our study aims to determine whether there are such associations.

There are, in turn, several versions of the stable-self explanation that differ in terms of exactly what they suppose it is that people believe, when they believe there to be a stable-self. We take there to be two very fairly natural such versions, which we call the *soul-version* and the *core-version,* though we make no claims that these are the only versions of the view. According to the soul-version, at least one way of believing that there is a stable-self (which, recall, is the view that there is some core, unchanging aspect of the self not the belief that the self *as a whole* is stable or unchanging) is to believe that people have souls. According to the core-version of the view, there is simply some core, unchanging, aspect of the self which may or may not be a soul.

These two views are, of course, consistent with one another. One might think that there is a core unchanging aspect of the self *which is* the soul; or one might think that there is both a core unchanging aspect of the self, as well as a soul. So it may be that one, or both, of these versions of the stable-self explanation are correct. However, since they are distinct views on what it is for people to believe that there is a stable-self, we investigate each of them separately.

There already exists a well-established psychological metric for measuring religiosity and associated supernatural beliefs: the Supernatural Belief Scale (SBS) developed by Jong, Bluemke and Halberstadt (2013). In order to test the soul-version of the stable-self explanation we presented participants with one of the statements in that scale, which measures the extent to which people take themselves to have a soul, and asked them how much they agree with the statement.

In order to measure people’s belief that there is a core, unchanging aspect of the self, we presented them with two vignettes each of which describes a character, Suzy, who is either described as having a core, stable, component of herself (Stable Self Universe) which makes her who she is, and one which describes Suzy as lacking any such core, unchanging aspect of self (Unstable Self Universe). We then asked participants how much like Suzy, in this regard, they think they are.

Participants were also presented with two *time* vignettes, one of which describes a dynamical world and one a non-dynamical world, and we asked which of these participants think is most like our world. We used this as a measure of people’s beliefs about whether time robustly passes or not.

Finally, we presented participants with a range of moving time and moving ego ‘feels like’ expressions, and we asked participants whether things seem to them as described by these expressions. These statements were adapted from Latham, Miller and Norton (2020). We use people’s responses to the moving time expressions as a measure of the extent to which they report that it seems to them as though time robustly passes, and their responses to the moving ego expressions as a measure of the extent to which they report that it seems to them as though the self moves.

If the soul-version of the stable-self explanation is correct, we should find that there is an association between believing that one has a soul and believing that time robustly passes, and believing that one does not have a soul and believing that time does not robustly pass (H1). We should also find that there is an association between believing that one has a soul, and reporting that it seems as though time passes, and between not believing that one has a soul and reporting that it does not seem as though time robustly passes (H2).

Although our aim is primarily to probe the stable-self explanation, in either its soul-version or core-version, we can also go some way towards pulling apart the moving-time and moving-self versions of the view in each of their soul-version incarnations. If the moving-self soul-version view is correct, we should find that people who have higher soul judgement scores also tend to have higher scores on the moving ego expressions (H3). By contrast, if the moving-time soul-version of the view is correct, we would expect to find that people who have higher soul judgment scores do not also tend to have higher scores on the moving time expressions. That is because according to the moving-self view, people who believe that they have a stable-self (by believing they have a soul) tend to misdescribe their persisting-self experiences as being experiences as of a moving self, and then they mistake those experiences, thus descried, as experiences as of time robustly passing.

If the core-version of the stable-self explanation is correct, then we should find that there is an association between believing that one has a core unchanging aspect of the self and believing that time robustly passes, and believing that one does not have a core unchanging aspect of the self and believing that time does not robustly pass (H4). We should also find that there is association between believing that there is a core unchanging aspect of the self and reporting that it seems as though time passes and between not believing that there is a core unchanging aspect of the self, and reporting that it does not seem as though time passes (H5).

Lastly, if the moving-self version of the core-version of the view is correct, we should find an association between higher scores on the moving ego expressions and higher levels of agreement that the self is like Stable Suzy (H6).

**3. Methodology and Results**

**3.1 Methodology**

*3.1.1 Participants*

330 people participated in the study. Participants were U.S. residents, recruited and tested online using Amazon Mechanical Turk, and compensated $2 for approximately 10 minutes of their time. We adopted the customary quality control measures. First, to avoid bots, we used only those MTurk participants who have a HIT (task) approval rate of at least 95% and who have had their HITs (tasks) approved at least 1000 times. That means that all our participants had already successfully completed at least 1000 other studies, and received at least a 95% approval rating on these tasks, a standard that can be expected to eliminate most bots. Second, our study included both attention check questions and comprehension check questions. Participants who failed to correctly answer *all* comprehension and attention check questions correctly were excluded from the analyses. The remaining sample was composed of 115 participants (44 female; aged 23-63, M = 36.01, SD = 8.54). Ethics approval for these studies was obtained from the [blanked] Human Research Ethics Committee. Informed consent was obtained from all participants prior to testing. The survey was conducted online using Qualtrics.

*3.1.2* *Materials and Procedure*

Participants were first asked how much they agree with the statement, “Human beings have immaterial, immortal souls” on a scale from 1 (strongly disagree) through to 7 (strongly agree). The statement is taken from The Supernatural Belief Scale (SBS) developed by Jong, Bluemke and Halberstadt (2013) to measure tendency to believe in supernatural entities.[[11]](#footnote-11)

Then participants see a series of moving time and moving ego expressions (in randomized order) and respond, on a Likert scale from 1 (strongly disagree) to 7 (strongly agree). These statements are amended from Latham, Miller and Norton (2020).

**Moving Time Expressions**

1. It feels to me like the present moves.
2. It feels like the events of tomorrow are moving towards me.
3. It feels like the events of yesterday are moving away from me.

**Moving Ego Expressions**

1. It feels like I am moving through time.
2. It feels like I am moving towards the events of tomorrow.
3. It feels like I am moving away from the events of yesterday.

Question order and response options were randomized across participants.

In the second part of the experiment participants were presented with two sets of vignettes, in random order, and answered a series of questions.

The time vignettes read as follows:





After reading *each* time vignette participants responded to 3 comprehension questions to which they could respond (a) true or (b) false.

1. In Universe [A/B] other times are like other places.
2. In Universe [A/B] there is an objective fact as to which events are present.
3. In Universe [A/B] events are always past or future relative to other events.

Participants were also required to respond to one attention check question (after one of the vignettes, randomly):

In this vignette, Suzy’s 11th birthday is 5 days after she falls and breaks her:

* 1. Heart
	2. Arm
	3. Leg
	4. School project

Finally, both vignettes were once again presented, and participants were asked “Which universe do you think is most like our universe?” and given two options (a) Universe A and (b) Universe B.

Participants who failed to correctly answer *all* the comprehension questions regarding the time vignettes, were excluded from the analyses. At no point could participants return to a previous screen.

Participants then read a series of self-vignettes in random order and responded to statements.

The self-vignettes read as follows:





After reading *each* self-vignette participants responded to 2 comprehension questions to which they could respond (a) true or (b) false.

In this vignette Suzy:

1. Has a core part that never changes and makes her who she is.
2. Has no core part that never changes and makes her who she is.

In this vignette Suzy:

1. Never changes
2. Changes constantly

Participants were also required to respond to one attention check question (after one of the vignettes, randomly):

In this vignette, Suzy is:

* 1. a dog
	2. an astronaut
	3. an office worker
	4. a banker

Participants who failed to correctly answer *all* the comprehension questions regarding the self-vignettes, were excluded from the analyses. At no point could participants return to a previous screen.

**3.3 Results**

Before presenting our analyses, we will begin by summarising the findings with respect to each hypothesis. Our first pair of hypotheses regarded the soul-version of the stable-self explanation.

If this version of the explanation is correct, we hypothesised that (H1) there would be an association between higher soul judgment scores and judging that the dynamical universe is more like our universe. This hypothesis was not supported, and we found no evidence of a difference in soul judgment scores between those who judge our universe is most like the dynamical vignette and those who judge our universe is most like the non-dynamical vignette. Next, we hypothesised that (H2) there would be a positive association between scores on the moving time expressions and soul judgment scores. While we found evidence of an association it was only *weak*.

Our second pair of hypotheses regarded the core-version of the stable-self explanation. If this version of the explanation is correct, we hypothesised that there would be an association between judging that the self is like Stable-Suzy and judging that the dynamical universe is more like our universe, and judging that the self is more like Unstable-Suzy and judging that the non-dynamical universe is more like our universe (H4). This hypothesis was not supported, and we found no evidence of an association. Next, we hypothesised that there would be an association between higher scores on the moving time expressions and judging that the self is like Stable-Suzy, and similarly between lower scores on the moving time expressions and judging that the self is like Unstable-Suzy (H5). This hypothesis was not supported and there was no evidence of an association.

Finally, if the moving-self version of the soul-version of the explanation is correct, we should find that there is an association between scores on the moving ego expressions and soul judgment scores (H3). If the moving-self version of the core-version of the explanation is correct, we should that there is an association between higher scores on the moving ego expressions and judging that the self is like Stable-Suzy, and similarly between lower scores on the moving ego expressions and judging that the self is like Unstable-Suzy (H6). We found a weak association between scores on the moving ego expressions and soul judgment scores (H3) but no association between scores on the moving ego expressions and beliefs about a core unchanging self (H6).

Table 1 below shows participants' judgments to the soul, moving time and moving ego expressions between those who judge our world to be more like the dynamical world and those who judge our world to be more like the non-dynamical world. The ‘moving time’ and ‘moving ego’ rows show the average level of agreement to the three moving time and moving ego expressions.

*Table 1. People’s soul, moving time and moving ego expression judgements between dynamism and non-dynamism.*

|  |  |  |
| --- | --- | --- |
|  | **Dynamism (n = 58)** | **Non-Dynamism (n = 57)** |
| **M** | **SD** | **M** | **SD** |
| **Souls** | **4.67** | **1.51** | **5.16** | **1.46** |
| **Moving Time** | **4.89** | **0.96** | **5.27** | **0.77** |
| Present Moves | 4.76 | 1.26 | 5.26 | 1.11 |
| Event Towards | 4.97 | 1.23 | 5.32 | 0.83 |
| Event Away | 4.93 | 1.32 | 5.25 | 1.02 |
| **Moving Ego** | **5.00** | **0.99** | **5.27** | **0.87** |
| I Move | 4.95 | 1.16 | 5.32 | 1.07 |
| I Towards | 5.09 | 1.17 | 5.23 | 1.05 |
| I Away | 4.97 | 1.11 | 5.28 | 1.05 |

To test whether there was an association between dynamism and non-dynamism, and people’s soul judgement scores we ran a between-subjects t-test (H1). The results of this test found no evidence of a difference between people’s soul judgement scores and whether they thought our universe was more like the dynamical or non-dynamical universe, *t*(113) = -1.695, *p* = .093. Next, to test whether there was a positive association between people’s soul judgments scores and, moving time and moving ego expressions scores, we calculated two separate Spearman’s rho correlations. This showed that there was a *weak* positive association between people’s soul judgments, and their moving time, *r*(113) = .367, *p* < .001, and moving ego *r*(113) = .318, *p* < .001, expression judgments.

Table 2 below shows participants judgments to the soul, moving time and moving ego expressions between those who take themselves to be more like Stable-Suzy and those who judge themselves to be more like Unstable-Suzy. Once again, the ‘moving time’ and ‘moving ego’ rows show the average level of agreement to the three moving time and moving ego expressions.

*Table 1. People’s soul, moving time and moving ego expression judgements between dynamism and non-dynamism.*

|  |  |  |
| --- | --- | --- |
|  | **Stable-Suzy (n = 67)** | **Unstable-Suzy (n = 48)** |
| **M** | **SD** | **M** | **SD** |
| **Souls** | **5.07** | **1.37** | **4.69** | **1.75** |
| **Moving Time** | **5.08** | **1.02** | **5.08** | **0.69** |
| Present Moves | 5.03 | 1.31 | 4.98 | 1.06 |
| Event Towards | 5.21 | 1.11 | 5.04 | 0.99 |
| Event Away | 5.00 | 1.30 | 5.21 | 1.01 |
| **Moving Ego** | **5.05** | **1.07** | **5.26** | **0.70** |
| I Move | 5.01 | 1.24 | 5.29 | 0.94 |
| I Towards | 5.18 | 1.18 | 5.13 | 1.02 |
| I Away | 4.96 | 1.22 | 5.35 | 0.81 |

To test whether there was a difference in the number of people who judged that they were more like Stable-Suzy than Unstable-Suzy we ran a one-sample chi-square test. The result of this test found no evidence that people favour Stable-Suzy over Unstable-Suzy, *χ2*(1, n = 115) = 3.139, *p* = .076. We ran between-subjects t-tests to test whether there was an association between Stable- and Unstable-Suzy, and people’s moving time and moving ego expressions scores (H4, H6). Once again, we found no association between people’s moving time, *t*(113) = 0.19, *p* = .985, or moving ego, *t*(113) = -1.171, *p* = .122, expressions scores and whether they thought they were more like Stable- or Unstable-Suzy.

Finally, to test whether there was an association between people’s judgments regarding whether our universe is more like the Dynamical or non-Dynamical universe, and whether they are more like Stable- or Unstable-Suzy we ran a two-way chi-square test (H3). The result of this test found no evidence of an association between people’s judgments regarding dynamism and persistence, *χ2*(1, n = 115) = 0.209, *p* = .648.

1. **Discussion**

Our results speak to two issues. The first of these regards the status of the stable-self explanation and, of the more general persisting-self explanation. The second of these regards the proper explananda that a theory of time (be it dynamical or otherwise) must explain. We will take each of these in turn.

4.1 Stable-self explanation

We will begin, in this section, by reflecting on what our results tell us regarding the stable-self explanation. In light of that, we will suggest (4.1.1) that further investigation, particularly of an empirical kind, of the replaced-experience explanation is called for, and we will discuss some of the challenges of such an investigation.

What, then, do our results tell us about the stable-self explanation? Well, we found no evidence to support the core-version of the stable-self explanation. There was no association between people believing that there is an unchanging core aspect of the self, and either reporting that it seems to them as though time robustly passes or believing that time does robustly pass. We did find very weak evidence in favour of some aspects of the soul-version of the view, insofar as we found a weak association between people believing that they have a soul, and their scores on the moving time expressions. We did not, however, find any association between their beliefs about whether they have a soul, and their beliefs about whether time robustly passes. This suggests that perhaps a *partial*, and *very minor* aspect of the explanation of why people report that it seems to them as though time passes, is that people believe that they have an unchanging aspect of the self, which is the soul, and that this leads them to be more inclined to describe their persistence experiences in terms of time moving, and hence to come to report that it seems to them as though time robustly passes. Nevertheless, given the weak association here, this can be at best a very partial explanation of why people report that it seems this way, and hence a very partial explanation of the reported experience explanandum.

Interestingly, the evidence from our studies is consistent with the moving-self version of the explanation. We found the same weak association between people believing that they have a soul, and reporting *both* that the self moves and that time moves. This is consistent with people who believe they have a soul *first* mis-reporting their persisting-self experiences as experiences of a moving self, and *then* coming to mistake those experiences, thus described, for experiencing as of robust passage. By contrast, had we found no association between people’s belief that they have a soul and them reporting that the self moves, this would have tended to undermine them moving-self version of the view in favour of the moving-time view. Our finding here may even be taken to be weak evidence in favour of the moving-self view. It could be argued that if people were to simply directly misdescribe their persisting-self experiences as experiences of time moving and not as of the self moving, as the moving-time version of the view suggests, then it is puzzling why there would be any association at all between people believing that they have a soul, and reporting that it seems to them as though the self moves.

Despite finding this weak association, we found no evidence that people’s soul judgments were associated with their beliefs about whether time robustly passes. Thus, *at best* we should conclude that the soul-version of the stable-self explanation (and perhaps more specifically the moving-self version of that view) is a very partial explanation of people reporting that it seems to them as though time robustly passes, but is not an explanation of people’s belief that time robustly pass, and hence does not explain the belief explanandum.

Of course, it could still be that there is some other version of the stable-self explanation for which there would be more empirical support. Perhaps people’s belief that there is a stable-self is neither properly captured by their belief that there is a soul, nor their belief that there is a core, unchanging, aspect of the self. But it is not obvious in what else such a belief could consist. So, at this time we are sceptical that some other version of the stable-self explanation will find stronger empirical support.

If so, then our results, taken in conjunction with the earlier results of Baron et al, provide little to no support for the broader persisting-self explanation. Instead, taken jointly these results tend to suggest that there is no connection between people’s beliefs regarding *themselves* *qua persisting self,* and people’s beliefs about whether time robustly passes, and likely little to no connection between people’s beliefs regarding themselves qua persisting self and people reporting that it seems to them as though time robustly passes.

4.1.1 The Replaced-Experiences Explanation

This suggests that some other explanation is required of the belief explanandum and the reported experience explanandum.

To our knowledge, of the three classes of explanation that the deflationist might endorse—the open-future, replaced-experiences, and persisting-self explanations—the only one that is yet to be experimentally probed is the replaced-experiences explanation. Given that none of the experimental work that focuses on the open-future explanation found any support for this view, our results in this paper give us good reason to devote serious consideration to, and experimental investigation of, the replaced-experiences explanation.

There are, we think, two important factors to consider in future empirical research that investigates this class of explanation.

The first is that it is not obvious how empirically tractable this explanation will prove to be. It involves two key ideas: (a) that we have a meta-level representation of our experiences as being *replaced* over time and (b) that our experiences lack a *temporal viewpoint*.

Consider, (a). How should we understand (a)? It seems obvious that humans not only have different experiences at different times, but that they also represent their experiences as changing, in the sense of having a meta-level representation *that they have different experiences at different times.* If that is all that (a) requires, then further empirical work seems unnecessary. Perhaps, though, we should interpret (a) as being true only if there is something more to representing our experiences as being replaced over time, than its merely being the case that we meta-level represent that we have different experiences at different times. Perhaps, it also needs to be that we represent that these experiences are ‘replaced’ in some further sense. If this is so, then more needs to be said about exactly what this representation of replacement consists in, as distinct from (i) a meta-level representation of the fact that our experiences change and (ii) a representation of replacement that consists in a change in which experiences are objectively present (i.e., one that represents robust passage). For it seems trivial to show that (i) is true, and (ii) would commit the non-dynamist to some kind of passage illusionism. Until we know what representing replacement consists in, it is not clear how we would empirically investigate whether people have such a representation.

Next, consider (b). What is required for it to be true that our perceptions lack a temporal viewpoint, and how could we empirically test this claim? We take it that if our perceptions really do lack a temporal viewpoint, then it should be that people *cannot* *imagine* looking at the same events from a different temporal perspective. It is already challenging to show that people are unable to imagine to something. Even setting that worry aside though, the question remains as to what it is that, according to this view, people are unable to imagine. In turn, it is unclear exactly how to empirically probe this issue.

What might it be for us to be unable to imagine looking at some events from a different temporal perspective? Well, let’s consider some examples of what *might* be meant be this. Consider the birth of star Freddie. One possibility is that imagining perceiving that event from a different perspective just consist in imagining having that perceptual experience at a different time than one in fact does: for instance, most notably, having that perceptual experience at a later time than one does. If that is all that is required, however, then we think it plausible that we can imagine looking at events from a different temporal perspective. If the light from Freddie’s birth were to travel a little more slowly, then it would reach us at a later time than it in fact reaches us, and we would perceive the very same event of Freddie’s birth, but at a later time than we in fact do. Even if light cannot, as a matter of nomic possibility, travel more slowly than it does, we can certainly imagine that it can.

But perhaps this is not what is meant by the claim that we cannot imagine events from a different temporal viewpoint. After all, in the case just outlined our perception of the birth of the star will be the same whenever we have it, it we will simply be that the perception is located at different times relative to the birth of the star.

A second possibility, then, is that to imagine events from a temporal viewpoint is to imagine them both from the viewpoint of being later than those events, and to imagine them from the viewpoint of being earlier than those events. After all, in the case of spatial viewpoint we can imagine looking at some state of affairs from, as it were, the front and also from behind.

Arguably though, if this is what is required then we can still imagine this being so. After all, it seems plausible that we can imagine being located earlier than Freddie, and having an experience of Freddie’s birth. To do this, we just need to imagine that there is backwards causation so that information (by way of light) can flow backwards from Freddie’s birth to our earlier time. But again, we are unsure whether this kind of imagining would count as imagining the event from a different temporal viewpoint. After all, in this case the event ‘looks’ the same; it has the same perceptual content. IT is just that we are located in a different (earlier) location. But when we see some state of affairs from a different spatial viewpoint, the resulting perceptual content is often different, precisely because we are seeing that state of affairs from a different spatial location (and so we are seeing different of its parts).

A third option, then, is that what is required to imagine an event from a different perspective is to imagine perceiving the *temporal* parts of that events differently, i.e., in a different temporal order. If that is what we mean, though, it is still unclear that we are unable to imagine taking a different temporal viewpoint. Arguably, we can imagine that perceiving Freddie’s birth in the reverse order to the order in which we in fact perceive that event. This will be so if we can imagine perceiving not an explosion (Freddie’s birth) but rather, an implosion (in which the spatial parts of Freddie come together and eventually cease to exist). In order to imagine this, we perhaps need be able to imagine that there is both backwards causation (so that we can perceive the event earlier than it occurs) and that later events travel faster than earlier ones, so that we perceive later events as occurring before earlier ones. Then we would perceive Freddie go from being an existing star, to imploding and ceasing to exist.

If any of these options for what would be required to count as taking a different temporal viewpoint are right, then it is arguable that people can imagine doing so; speaking to that issue would of course require empirical investigation. Our worry, however, is that perhaps none of these options is what is intended by the idea of taking a different temporal viewpoint. If that is so, however, more work would need to be done to spell out what would be required to take a different temporal viewpoint, so that empirical work could probe whether people can in fact imagine, or not, doing so.

Thus, although we think that there could profitably be empirical work undertaken to investigate the replaced-experience explanation, before it could be done some further conceptual unpacking of what that view involves would be necessary.

4.2 The Explananda

This brings us to the second important aspect of our results, which concerns the explananda to be explained. As we framed matters earlier in the paper, the non-dynamist needs to explain both the belief explanandum and the reported experiences explanandum. This framing captures something about the contemporary dialectic in the philosophy of time: namely, it tacitly suggests that the non-dynamist has a special explanatory challenge which the dynamist does not, because *all* that needs explaining is why we believe that time robustly passes, and why we report having experiences as of time robustly passing. If this is all that needs explaining, then the dynamist appears to have a perfectly good explanation: namely that time does in fact robustly pass, and as a result we experience it doing so and hence we report having these experiences (explaining the reported experience explanandum) and as a result, we come to believe that time robustly passes (explaining the belief explanandum).

In fact, though, while the belief and reported experiences explananda certainly require an explanation, they are not the only things that require explaining. We also need to explain why many people do not report that it seems to them as though time robustly passes, and why many do not believe that time robustly passes. Indeed, we might better put the explananda as *follows*: (A) why do *some* people believe that time robustly passes while others do not, and (B) why do *some* people report that it seems to them as though time robustly passes, while others do not.

Let's start with (A): why is the relevant explananda not simply that people believe that time robustly passes, but rather, that some people believe that time robustly passes and others do not? Well, we already know from previous work that although a majority of people believe that time robustly passes, a very substantive minority believe that it does not. Latham, Miller and Norton (2019) and Latham, Miller and Norton (2021, experiment 1) found a 70/30 split in favour of dynamism, while Hodroj, Latham, Lee-Tory and Miller (2022), Baron, Everett, Latham, Miller, Tierney and Oh (ms), Latham, Miller, Tarsney and Tierney (2022) and Latham, Miller and Norton (2021, experiment 2) found roughly a 60/40 split in favour of dynamism. Already, then, these studies call out for an explanation of the fact that between 30% and 40% of people do not believe that time robustly passes. Our current study reinforces this.

It is notable that we found that the split between people who judged that our world is dynamical versus non-dynamical was no different from a 50/50 split. Thus, it is possible that a *majority* of people do not believe that time robustly passes. In all, though, we take our study to be roughly consistent with these previous findings, given that people’s judgements have been shown to vary depending on the exact details of the vignettes provided. Certainly, however, while many people believe that time robustly passes, it is clear that what requires explanation is (A), that while *some* people believe that time robustly passes others do not.

What of (B)? Well again, there was already empirical data that suggested that some, but by no means all, people report that it seems to them as though time robustly passes. Importantly, our results in this study closely replicate those of Latham, Miller and Norton (2020) and Shardlow et al (2020) in this regard. Thus, what requires explanation is why some, but not all, people report that it seems as though time robustly passes.

Once we see that the relevant explananda are in fact not just the belief and reported experience explananda, but instead are (A) and (B) above, we see that the explanatory challenge is not just a challenge for the non-dynamist. The dynamist faces the *same* explanatory challenge. As we noted at the beginning of this paper, the dynamist appears to have a good explanation of why we report that time seems to robustly pass, and, in turn, why we believe that time robustly passes: namely, because time does robustly pass. But *this* can hardly be a complete explanation of (A) and (B). For it is no explanation at all of why some people do *not* report that it seems to them as though time robustly passes, nor of why some people believe that time does not robustly pass. Thus, our results, in conjunction with those of previous studies, pose a dual explanatory challenge for philosophers of time whether they be dynamists or non-dynamists.

Moreover, just as it has proven non-trivial for the non-dynamist to explain why people believe that time robustly passes, and why they report its seeming so, it will likely be non-trivial for the dynamist to explain why people believe that time does *not* robustly pass, and why they report its *failing* to seem so. To get a feel for why this is, notice that it will be fairly natural for the dynamist to say that relatively low-level evolved perceptual mechanisms track the robust passage of time,[[12]](#footnote-12) and deliver to us experiences as of its robust passing, and if in virtue of this we relatively automatically come to believe that time robustly passes. But if this is what they say, then it will be very difficult to explain why between 30% and 50% of people form the belief that time does not robustly pass, and why so many people do not report that it seems to them as though time robustly passes. We will not aim, in this paper, to take up this aspect of the dynamist’s explanatory challenge: we merely wish to point out that there is such a challenge.

Rather, we want to return to the hitherto under-explored replaced-experiences explanation with (A) and (B) in mind. If this explanation is to be successful on behalf of the non-dynamist, it needs to explain both why some people believe that time robustly passes, while others do not, as well as why some people report having experiences as of robust passage, while others do not.

There are three slightly different explanatory structures that the non-dynamist might employ as part of the replaced-experiences explanation. On the first of these, people report its seeming as though time robustly passes (if they do) because (1) they represent their experiences as being replaced, and (2) because those experiences have no temporal viewpoint, they conceptualise, and hence report, those experiences as simply being had, *simpliciter*. The combination of (1) and (2) leads people to report that which experiences they have, *simpliciter*, changes, and this tends to lead them to report having experiences as of robust passage, because robust passage consists in there being some change in which things are present *simpliciter* That people report having experiences as of robust passage then explains why people come to believe that time robustly passes.

A second version of the view holds that (1) and (2) explain why people come to believe that time robustly passes, and, in turn, people’s having this belief explains why they come to report that it seems to them as though time robustly passes. For instance, on this version of the view it would be natural to suppose that people’s belief that time robustly passes influences the way they describe or interpret their experiences, and thus brings it about that people tend to (mis)report having experiences as of robust passage.

Finally, a third version of the view holds that the combination of (1) and (2) are a common cause of people’s belief that time robustly passes and of their reporting that it seems as though time robustly passes.

All of these versions of the view, however, still have to explain the remaining aspects of (A) and (B): namely they have to explain why some people believe that time does not robustly pass, and why some people report that it does not seem to them as though time robustly passes. One difficulty for the replaced-experiences view is that it is not so obvious how an appeal to (1) or (2) can do this. The problem is that both (1) and (2) appear to be features that we might expect to be widely shared. So, appealing to *just* those features is unlikely to explain the *differences* we find in people’s beliefs or their reports regarding their experiences.

This suggests that the replaced-experiences view will need supplementing. One possibility is that the obtaining of (1) and (2), which are pervasive, will lead to people believing that time robustly passes and to reporting that it seems as though time robustly passes, *in the absence of defeaters.* Some people, however, might face such defeaters by way of information from contemporary science. In the face of that information these people come to shed that belief. In turn, if the second version of the explanatory structure is correct, we would expect those people to also cease to report that it seems to them as though time robustly passes.

One difficulty with this suggestion, however, is that Latham, Miller and Norton (2019) found no association between people’s beliefs about whether time robustly passes or not, and their levels of education or familiarity with science. This tends to undermine the idea that the reason that people do not believe that time robustly passes is because the belief they would otherwise have had, has been shed in light of contemporary science.

A second possibility that the defender of the replaced-experiences explanation might explore is the idea that whether someone is led to the view that time robustly passes on the basis of (1) and (2) is sensitive to *further* features that vary between individuals. Here is one suggestion. Miller, Holcombe and Latham (2020) attempt to explain why (as they see it) people mistakenly describe their own experiences as being experiences as of robust passage. In doing so, they suggest that the use of what they call *passage friendly language and concepts* results in some, but not all, people, interpreting and describing their temporal experiences as being experiences as of robust passage. The defender of the replaced-experiences explanation might borrow certain aspects of their view, and argue that the extent to which different individuals use such language, and employ such concepts, plays a role in whether (1) and (2) cause them to come to believe that time robustly passes and to report their experiences as being as of robust passage That is to say, the causal influence of (1) and (2) will depend on these personal-level factors about language and concepts which we can expect to vary from person to person.

Whether this is the right sort of difference to which to appeal is very much up for grabs; but we take it that *some* additional factor that varies across individuals will need to be imported into the replaced-experiences account if it is do the work it needs to do in explaining, not (a) and (b) but instead (A) and (B).

**5. Conclusion**

Our hope is that this study, in conjunction with previous empirical work, adds to a clearer understanding of both what it is that needs explaining, that is, what explanatory burdens both the dynamist and the non-dynamist incur, and, in addition, provides further clarity regarding which of the current explanatory strategies enjoys empirical support. We have argued that both the dynamist and the non-dynamist face the same explanatory challenge: namely explaining why some, but not all people, believe that time robustly passes, and why some, but not all people, report that it seems as though time robustly passes. Neither of these explananda are easily explained by either the dynamist or the non-dynamist. We have, in addition, considered four sorts of explanations to which the non-dynamist might appeal, three of which are open to the deflationist. Our results, in conjunction with earlier ones, suggest that two of these explanations—the open-future and persisting-self explanations—do not yet enjoy empirical support. Hence, we have argued that the third—the replaced-experiences explanation—is worthy of further empirical investigation, and we have gestured towards some ways in which the view could be further fleshed out so as to explain the correct explananda. There is, of course, much more work to be done in this regard; but we hope to have at least begun to clear the way towards the beginnings of that work.

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1. We use the term ‘robust’ to distinguish this kind of temporal passage from what Skow (2015) calls anodyne or anemic passage, which is the kind of temporal passage that some B-theorists endorse, and which consists in (roughly speaking) succession. See Oaklander (2015) Deng (2013) and Leininger (2021) who defend views of this kind. [↑](#footnote-ref-1)
2. This is not at all an objectionable move on our behalf, but let it be noted that some philosophers use this terminology differently, and not everyone will say a theory is dynamic iff it stipulates that time robustly passes. [↑](#footnote-ref-2)
3. A-theorists include Bourne (2006); Broad (1923; 1938); Cameron (2015); Craig (2000); Zimmerman (2005); Skow (2015); Smith (1993); Sullivan (2012); Tallant (2012); Tooley (1997). [↑](#footnote-ref-3)
4. See, for example, Oaklander (2012), Mellor (1998); Le Poidevin (2007), Price (1996) and Farr (2012; 2020a, 2020b). [↑](#footnote-ref-4)
5. This view is often known simply as phenomenal illusionism (see Baron, Cusbert, Farr, Kon and Miller (2015) and Miller, Holcombe and Latham (2018)). However, since one can be a phenomenal illusionist about contents other than robust passage, we call this view passage illusionism. Hoerl (2014) refers to this view as an error theory. Le Poidevin (2007), Paul (2010), Dainton (2011, 2012), Hohwy, Paton, and Palmer (2015) are all passage illusionists. It remains unclear whether other non-dynamists such as Norton (2010) and Savitt (1996) are rightly characterized as passage illusionists or not. [↑](#footnote-ref-5)
6. Deng (2013), Bardon (2013), Hoerl (2014), Braddon-Mitchell (2013), Ismael (2012), Frischhut (2015), Miller, Holcombe and Latham (2020) Miller (2019) Miller (2022), Latham, Miller and Norton (2020b) all defend versions of deflationism. [↑](#footnote-ref-6)
7. Though see also Hohwy, Paton, and Palmer (2016) for a similar view using a replacement of probabilistic perceptual inferences. One notable feature of this view is a ‘distrust of the present’, which, in part, drives the replacement of the current perceptual hypothesis and might also serve to distinguish why the current moment might appear distinct. [↑](#footnote-ref-7)
8. Arguably, Balashov (2005) has a similar view. [↑](#footnote-ref-8)
9. Hoerl (2018) defends a view of this kind. [↑](#footnote-ref-9)
10. To be clear, we don’t think that this is *all* they have in mind; we take it that they are intending to capture the difference between enduring and perduring selves. [↑](#footnote-ref-10)
11. See, Jong, J., Bluemke, M., & Halberstadt, J. (2013). Fear of death and supernatural beliefs: developing a new Supernatural Belief Scale to test the relationship. European Journal of Personality, 27, 495—506. On the development of the questioner. The version we use here can be found at <https://static1.squarespace.com/static/53578960e4b0cc61351ba675/t/5553c431e4b0ac6bf324081c/1431553073591/SBS-10.pdf> (you can see that the latter two statements are rephrased in a more inclusive way). [↑](#footnote-ref-11)
12. Though it is worth noting that to our knowledge no one has proposed a good account of how people could perceptually track the robust passage of time. Indeed, there are several arguments by Prosser (2007; 2012; 2016) to the effect that even if there were robust passage, we could not perceptually track it. So even providing this aspect of the explanation is non-trivial. [↑](#footnote-ref-12)