**Does it really seem to us as though time passes?**

Abstract

It is often assumed that it seems to each of us as though time flows, or passes. On that assumption it follows either that time does in fact pass, and then, pretty plausibly, we have mechanisms that detect its passage, or that time does not pass, and we are subject to a pervasive phenomenal illusion. If the former is the case, we are faced with the explanatory task of spelling out which perceptual or cognitive mechanism (or combination thereof) allows us to detect and track time’s passage (§2.1) If the latter, then we are faced with the task of explaining how, and why, we are subject to a pervasive phenomenal illusion (§2.2). There is, however, a third, somewhat less discussed, explanatory project. Rather than assuming that it seems to each of us as though time passes, and then attempting to explain why it seems that way, we jettison that assumption. According to these views it does not seem to us as though time passes; instead, we come to *falsely believe* that it seems to us as though time passes (§3). This view requires that we explain how we come to have systematically false beliefs about the way our experiences seem to us. This paper aims to motivate this third explanatory strategy and say something about what kind of cognitive mechanisms might be responsible for our having a false belief that it seems as though time passes, (§3.1) and why we might have evolved (some of) those mechanisms (§3.2). In particular, the paper does not aim to argue for this view: rather, it aims to present it as a viable contender alongside other more common views.

1. **Temporal Phenomenology**

Let us call our experience of temporal properties and relations our *temporal* *phenomenology*. This phenomenology includes our experiencing events to be in a temporal order, of a temporal duration, and separated by a temporal distance. It includes our experience of events as occurring in succession. It may include our experiencing time as having a direction (from earlier, to later). Perhaps it also includes our experiencing the past as somehow fixed and immutable, the present as especially salient and real, and the future as as-yet unsettled (though I will remain silent on whether it does). It is also often said that we experience time *as passing*. This is often described as an experience of future events coming ineluctably towards us, and then reaching us and becoming present, and then receding into the past, and is known as the phenomenology as of temporal passage. (I return to the “as of” shortly). The following are some characterisations of this phenomenology.

We are not only aware of [the passage of time] when we reflect on our memories of what has happened. We just *see* time passing in front of us, in the movement of a second hand around a clock, or the falling of sand through an hourglass, or indeed any motion or change at all. (Le Poidevin, 2007: 76, emphasis added).

….the flow of time, or passage, as it is known, is given in experience, that it is as indubitable an aspect of our perception of the world *as the sights and sounds that come in upon us,* even though it is not the peculiar property of a special sense. (Schuster 1986: 695, emphasis added)

In what follows I focus on just one aspect of our rich temporal phenomenology: our phenomenology as of temporal passage. That phenomenology is usually taken to be perceptual, in that it seems to us to represent the way the *world* is (as opposed to, say, imaginings, which seem a certain way to us, but don’t seem to be about the way the world is). Wherever we have perceptual phenomenology we can ask a range of questions, including:

**(a) Phenomenal content question**: what are those experiences *like*—what is the *content* of the experiences in question? (i.e. what do those experiences say the world is like?)

**(b)** **Mode of presentation question:** is there some special way that some contents of experiences are presented to us?

**(c) Cognitive mechanisms question:** what cognitive mechanisms are responsible for generating those experiences? (i.e. what brain processes cause these experiences, and which brain processes subserve, or realise, those experiences?)

**(d) Evolutionary explanation question**: what evolutionary explanation is there for our having those experiences?

**(e) Veridicality question:** are those experiences veridical? (i.e. is the world the way those experiences say it is?)

Philosophers have been interested in all four questions with regard to our temporal phenomenology generally, and our phenomenology as of temporal passage specifically.

Most philosophers have begun by considering the phenomenal content question. Since we want to be able to describe the content of mental states without prejudging the question of whether that content is veridical, we talk about a mental state having content *as of X,* by which we mean that themental state represents that things are *as though* X is the case. This leaves it open that X might, or might not, in fact be the case. In the case of temporal phenomenology, the mode of presentation question arises when we wonder whether the very same phenomenal contents can be presented to us as future, present, or past, or whether, instead, it is part of the content of an experience that said experience is presented to us as being past, present, or future. By and large I am going to try and side step the mode of presentation question, and just focus on the remaining four questions: that is more than enough to be getting on with!

Philosophers have typically answered the phenomenal content question by assuming that we have experiences that are *as of* time passing. Whether these are also experiences *of* time passing then depends on whether time passes, and whether its passing is appropriately connected to our having those experiences: it depends on the answers to the cognitive mechanisms, evolutionary explanations, and verticality questions. It is, then, these three questions that have been these philosophers’ predominant focus.

1. **The veridicality question**

Having answered the phenomenal content question by supposing that we have phenomenology as of temporal passage, philosophers frequently attempt to answer the veridicality question before they answer either the cognitive mechanism question or the evolutionary explanation question. That makes some sense. We would expect to search for somewhat different cognitive mechanisms to explain our phenomenology as of passage on the assumption that said phenomenology is veridical (because time passes) as opposed to the assumption that it is not veridical (because time does not pass). After all, on the former assumption our phenomenology is responsive to something in the world, and is tracking that thing. On the latter assumption our phenomenology is illusory. Since we would expect a mechanism that is successfully tracking something to behave rather differently from an illusion generating mechanism, determining which kind of mechanism we are looking for before we look for it, makes some sense.

Moreover, we would expect a somewhat different evolutionary explanation for the presence of a mechanism that successfully tracks the presence of temporal passage, than for a mechanism that generates an illusory phenomenology as of passage. In either case, of course, we will assume that the mechanism confers evolutionary benefits. But in the latter case we might expect the generation of such *pervasive* illusory phenomenology to be an unintended by-product (a spandrel) of the selected-for mechanism (rather than merely the output of a mechanism which, due to various evolutionary trade-offs, issues in occasional mistaken outputs).

So although this approach is by no means the only reasonable one, it makes some sense to answer the veridicality question *before* one attempts to answer the cognitive mechanism or evolutionary explanation questions. Given this, we find philosophers predominantly divided into two groups.

The first group of philosophers holds that time does not pass, and hence concludes that our phenomenology *as of* passage is not veridical: it is not a phenomenology *of* passage at all. We can call this view the *Phenomenal Illusion Thesis.* I consider that view in §2.2. Philosophers endorse this view largely (though not entirely) because of evidence from physics showing that temporal passage does not appear in contemporary physics. This is generally agreed, amongst physicists, (and many philosophers) to be strong evidence that time does not pass.[[1]](#footnote-2) By contrast, there are those who suppose that time does pass, sometimes in part because it allows us to answer the veridicality question in the affirmative. These philosophers conclude that physics must be mistaken, or at least, incomplete. This view allows us to say that *typically* our phenomenology is veridical: it seems as though time passes because, in fact, it does.[[2]](#footnote-3) We can call this the *Veridical Passage Thesis.* I consider this view in §2.1.

**2.1 The Veridical Passage Thesis**

According to the veridical passage thesis it seems to us as though time passes because we are having veridical experiences of the passage of time.[[3]](#footnote-4) The explanatory challenge for this view is to say *how* we track time’s passage, and thereby to answer the cognitive mechanism question, (as well as to say how we came to track it’s passage, and thus to answer the evolutionary explanation question).

On the face of it the assumption that these experiences are (typically) veridical ought make answering these two questions relatively methodologically straightforward: neuroscience, psychology, and evolutionary biology are fairly good at determining how it is we come successfully to track things in our environment. It’s worth noting that matters are a *little* more complicated in this case, since if time passes, it passes everywhere, at every time, for all of us, and its passage cannot be manipulated. So it will not be possible to experimentally manipulate the presence of temporal passage (or its rate of passing) in order to see what differences in the brain (say) are correlated with said manipulation. Nevertheless, setting aside this complicating factor, the explanatory task here is the familiar one of explaining how we come to have cognitive mechanisms that track something in the external world.

**2.2** **The Phenomenal Illusion Thesis**

By contrast to the veridical passage thesis, according to the phenomenal illusion thesis our experiences as of time’s passing are *never* veridical (Callender 2008; Le Poidevin 2007; Dainton 2011 p 405).[[4]](#footnote-5) Instead, we are subject to a pervasive phenomenal illusion as of time’s passing. If that is so, we can proceed to try and answer the cognitive mechanism and evolutionary explanation questions by trying to determine which evolutionary process, and which mechanism, could be responsible for such an illusion. Since being subject to a pervasive illusion is not likely to itself enhance fitness, we can expect (and indeed, this is what we find) that these accounts will try to explain the presence of this illusion as a by-product of something that is fitness enhancing: most likely the having of other veridical experiences. The details of that story, as it has hitherto been spelled out, vary. But in very broad brushstrokes these accounts appeal to idea that our experiences as of temporal passage are either the product of our motion phenomenology (Le Poidevin 2007, p. 76; Paul 2010), or the product of our motion phenomenology in combination with our phenomenology of change (Paul 2010, p. 346). In either case, details of the story are controversial along two dimensions. First, it is controversial exactly what the connection is between motion and motion/change phenomenology and a phenomenology as of temporal passage Second, it is controversial just what motion and change phenomenology *themselves* consist in. For instance, on this second issue, there is debate about how we come to have a phenomenology as of motion at all, rather than simply a phenomenology as of something being in a sequence of positions. The most common views about how motion phenomenology (and others besides) arises, hold that the contents of the experiences presented to us *as present*, consist in a temporally extended interval in which the contents appear as temporally structured. This is either because said experiences (and contents) are in fact temporally extended (as per *extensionalist* models such as those defended by Dainton (2011)) or because although the experience is not temporally extended, the contents of experiences are temporally extended (as per *retentionalist* models (see Gallagher 2003)). By contrast, there has, of late, been a resurgence of interest in snap-shot models, according to which neither the experiences themselves, nor their contents, are temporally extended (see Le Poidevin 2007; and Arstila 2017 and 2018). This latter have been motivated by recent empirical work which suggests that past phenomenal contents are not available to us in any significant manner. In many ways, however, it ought not matter just which of these proposals we adopt in order to make sense of temporal phenomenology in terms of motion or change phenomenology

To that end, a number of recent proposals have spelled out the idea that our phenomenology of change plays a crucial role in producing our phenomenology as of passage. Ismael, for instance, (2012) argues that each of us has a temporally embedded point of view: a representation of time relativised to a particular moment in a psychological history. The temporally embedded perspective is an individual’s representation of its history; its memories of memories, its anticipations, its memories of anticipations, and so on. From each temporally embedded perspective there is an asymmetry in how we represent, and come to know about, past and future decisions: we know about past decisions by *remembering* them, we know about future decisions by *deliberating* about what to do. In addition, there is a *temporally evolving view*; an ordered set of embedded perspectives, such that at each embedded perspective more of the past has been represented, and some of what were previously open future decisions are represented, later in the ordering, as fixed past decisions. It is the presence of this temporally evolving view, argues Ismael, that is responsible for our phenomenology as of passage: for the existence of this view explains why it seems to us as though future events are coming ever closer, and past events receding, why it seems as though we are moving through time, or time is moving over us.

A related proposal casts elements of Ismael’s view within a hierarchical Bayesian inference theory of perception (Hohwy, Paton, and Palmer 2015).[[5]](#footnote-6) On this view conscious perception is determined by whatever hypothesis about the cause of sensory input has the highest posterior probability—the ‘winning’ perceptual hypothesis. A perceptual hypothesis only counts as the winning one for a short period. As soon as our perceptual system settles on a winning hypothesis it begins decreasing the probability of that hypothesis as the best account of our current sensory input, because the external world constantly changes, and the best perceptual hypothesis to explain the incoming sensory stimuli at one time is less likely to be the best hypothesis about incoming sensory stimuli at later times. Our perceptual system is, at each time, placing the winning perceptual hypothesis head-to-head with alternative hypotheses about what is happening simultaneously with that very hypothesis.

According to Hohwy et al. our phenomenology as of passage is caused by the perceptual system predicting that the world is a changing place, so that at each time the perceptual system generates new alternative perceptual hypotheses that next best explain the current incoming sensory input. The idea is that the constant creation of new hypotheses (which are either vindicated, or not) about what is happening at successive moments generates a phenomenology of motion and change, and generates the sense that we are heading towards the future (or it is heading towards us). One might worry that such a view cannot accommodate its being the case that we have the relevant temporal phenomenology even if *nothing* perceptually changes. That, in turn, might give you reason to think that, at best, internal psychological changes must do some (or perhaps all) of the work of explaining why we have this phenomenology. Hohwy et al, however, might suggest that even in the absence of perceptual changes, the perceptual mechanism will still be updating in this manner: it is just that the input it received will be the same. Since the mechanism is *attuned* to expect change, it will still update in this manner, by decreasing the probability of the current hypothesis: it is just that it will turn out to have wrong to do so.

**3. The cognitive error thesis**

More recently, however, some philosophers have suggested that we ought reverse the order in which we attend to our four questions. These philosophers argue that we ought begin with the working assumption that *typically*, our temporal phenomenology—*whatever its content*—is veridical. That is, we should give very low credence to the idea that some aspects of our temporal phenomenology are *always* in error. Of course, this is not to say that we couldn’t find out that they are always in error. Rather, it is to suppose that this is a very unlikely outcome, and that, as such, we should think it unlikely that the Phenomenal Illusion thesis will be vindicated. So, at this stage of investigation, either we should we should accept the Veridical Passage Thesis as a working hypothesis, or we should accept, as a working hypothesis, that it does *not* seem to us as though time passes. Since many philosophers think we have independent reason to think that time does not pass (given to us from physics), this gives us reason to investigate the second of these options. Let’s call this second option the *Cognitive Error Thesis* (Hoerl 2014; Torrengo forthcoming; Braddon-Mitchell 2013; Deng 2017; Bardon 2013 p 95; Baron et al 2015; Miller, Holcombe and Latham forthcoming).[[6]](#footnote-7)It is the view that we do not have phenomenology as of passage; instead, we falsely *believe* that we have phenomenology as of passage.

Since defenders of this view think we don’t have phenomenology as of passage, let’s call the phenomenology we do have, our *purported passage phenomenology* While the phenomenal illusionist has to explain how, (cognitive mechanisms question) and why (evolutionary explanation question) we are subject to a pervasive phenomenal illusion, the cognitive error theorist has to explain how, and why, we are subject to a pervasive false belief about the content of certain of our phenomenal states. In what follows I gesture towards a recent proposal for addressing both how, and why, we come to have such false beliefs.

3.1 The Cognitive Mechanism Question

Miller, Holcombe and Latham (forthcoming) suggest two broad explanatory strategies on behalf of the cognitive error theorist: the inferentialist and misdescriptionist strategies. Each of these offers somewhat different answers to the cognitive mechanism and evolutionary explanation questions. While Miller et al do not point to *specific* mechanisms, they offer a higher-level account of what the think said mechanisms must be *doing*; that account, in turn, can be parlayed into a mechanistic account by discovering which mechanisms subserve the processes they describe.

Usually one would expect to explain our having a belief that time passes in terms of our having a phenomenology as of time passing. We believe the former on the basis of the latter. Since the cognitive error theorist denies that we have a phenomenology as of passage, she *must* deny this. She has to provide some independent explanation for our believing that time passes, which does not appeal to our phenomenology.

Inferentialists hold that the direction of explanation goes in the other direction: from our believing that time passes, to our believing that our phenomenology has content as of passage. Misdescriptionists hold that there is no direct explanatory connection between our belief that time passes and our belief about our own phenomenology: instead, there is a common cause both of our belief that time passes, and our belief about the content of our phenomenology.

According to the misdescriptionist, the common cause both causes us to believe that time passes, and to *mis*describe our phenomenology. Our misdescribing our phenomenology causes us to come to believe that its content is as of passage. Miller, Holcombe and Latham suggest that this common cause is the presence of passage-friendly language (more on this in §3.2).

To get a sense of how such a view might go, consider a different case: our phenomenology as of the sun rising. The sun doesn’t rise: instead, the earth moves relative to the sun. Phenomenal illusionists will say that we have phenomenology as of the sun rising, and that phenomenology is systematically illusory. Cognitive error theorists will say that our phenomenology is *not* as of the sun rising at all. Instead, it is (presumably) phenomenology as of the earth moving relative to the sun. But in English (at least) we use a host of expressions that imbed terms such as ‘sunrise’ and ‘sunset’, and we describe our purported sun-rising phenomenology using these expressions. That is, we *misdescribe* our phenomenology. Having done so, we come to believe that its content represents the rising of the sun when in fact it merely represents the relative movement of the earth and sun. Of course, in this case it’s easy to see why we came to use expressions like ‘sunrise’ and ‘sunset’: we had, in the past, explicit beliefs that the sun rose and set! So while the cognitive error theorist wants to say something similar about our temporal phenomenology as about our sun-related phenomenology, she will need some account of why we come to use the kinds of expressions we do, which does not appeal to standing beliefs about there being temporal passage. I return to this issue shortly. First, however, a question arises as to whether, *even if we had an account of how we come to use such language* which does not appeal to existing beliefs about there being temporal passage, there being such language would result in us misdescribing our experiences.

In fact, there is reason to think the misdescriptionist is on firm ground here. Miller et al suggest that the misdescriptionist appeal to a suite of evidence regarding the connection between the way linguistic communities speak about time, and write and read language, and the way that they conceptualize time (Boroditsky, Fuhrman, McCormick 2010; Fuhrman, McCormick, Chen, Jiang, Shu, Mao, & Boroditsky 2011; Chen 2007; Boroditsky 2001; Fuhrman & Boroditsky 2010; Casasanto & Bottini 2014). This evidence suggests that *if* we misdescribe our experiences using passage-friendly language, then we could indeed come to believe that those experiences are experiences as of passage.

By contrast, according to the inferentialist, we form the belief that our purported passage phenomenology is as of passage on the basis of a sub-personal inference from one belief to another. What are these two beliefs? One is the belief that time passes. The other is the belief that the *reason* we believe that time passes, is on the basis of our temporal phenomenology. Why think we have this second belief? Well, our purported passage phenomenology is perceptual: it involves the presentation as of mind-independent features of the world (distinct from features of our experience) in such a way that our phenomenology seems to be immediately responsive to the things in the world that it represents. Given that we believe that time passes, then, it’s natural to think that we believe that on the basis of having that phenomenology. After all, in general our perceptual beliefs are formed as a result of having perceptual phenomenology.

So suppose that we have these two beliefs: the belief that time passes, and the belief that the *reason* we believe that time passes, is on the basis of our temporal phenomenology. Then the inferentialist holds that we make a sub-personal inference on the basis of holding these two beliefs: we infer that our purported passage phenomenology is as of passage. Why would we infer this? Well, if our purported passage phenomenology is the reason we believe that time passes, then it is very plausible that the content of that phenomenology is as of passage. Otherwise, how could our having said phenomenology be a reason for us to believe that time passes? Hence we come to attribute to that phenomenology, the content as of time passing.

Miller et al point towards cases in which, plausibly, sub-personal inferences generate mistakes about our own reasons. For instance, they note that Morrot, Brochet, & Dubourdieu (2001) gave a panel of 54 wine tasters white wine, dyed red. The scent of the resulting ambiguous stimuli was described by the wine tasters using terms typically used to describe red wine. That is, the wine tasters believed that their wine-phenomenology was olfactorily as of red-wine. Plausibly, the wine tasters believed that the wine was red on the basis of their visual perception, and because of that they came to *believe* that their olfactory wine phenomenology was as of smelling red wine. Hence subjects believed that their olfactory phenomenology was (at least part of) the *reason* for their beliefs about the kind of wine they smelled. Subjects falsely believed they smelled red wine. On the basis of this, Miller et al hypothesise, they made a sub-personal inference that their olfactory phenomenology had the content as of smelling of red wine, and hence they came to believe that their phenomenology was as of red-wine smelling. This inferential pattern is just like that proposed by the inferentialist.

Both inferentialists and misdescriptionists need to show that we have mechanisms that could do the work ascribed to them. More taxingly, both need to provide an account of *why* we come to have a belief that time passes, if that belief is not generated by our purported passage phenomenology. Doing so goes some way towards answering the evolutionary explanation question (though only some way) and it is to this that I now turn.

3.2 The Evolutionary Explanation Question

Miller, Holcombe and Latham suggest that we believe that time passes because of *passage-friendly* language. According to the misdescriptionist, the presence of passage-friendly language is the common cause of both our belief that time passes, and our misdescription of our purported passage phenomenology. According to the inferentialist, the presence of passage-friendly language is the cause of our belief that time passes, and we then infer, on the basis of this belief and our belief that our purported passage phenomenology is the reason for our belief that time passes, to the belief that the content of our phenomenology is as of passage.

But why would we have passage-friendly language in the absence of passage, or of passage phenomenology? Miller et al appeal to a broadly evolutionary story about the function of language to suggest that we would. They argue that any language needs the resources to express the way things are from the standpoint of each embedded perspective. To do so, a language must mark the location and perspective of each embedded perspective, and distinguish past from future events at that location. The most straightforward way to do this is via grammatical tense and deictic (indexical) adverbs like ‘tomorrow’ or ‘yesterday’ and nominal temporal landmarks such as ‘next Christmas’ alongside the use of a marker such as ‘present’. In fact, all languages denote presentness in one way or other (Gell, 1992) and although there are languages without tense (such as Chinese), all languages have some set of deictic adverbials that indicate gradations of pastness and futurity of events with respect to the time of utterances (Sinha and Gardenfors 2014). Miller et al call such languages *minimally passage-friendly* and note that all actual languages are minimally passage-friendly. They then suggest that languages can also be *substantially* *passage-friendly* (or not) depending on the extent to which they include one (or both) of what are known as *moving time* or *moving ego* metaphors (Sinha and Gardenfors 2014). The moving time metaphor includes a whole suite of expressions which suggest that time itself moves, while the moving ego metaphor includes a suite of expressions which suggest that the ego moves through time. In both cases, the relevant expressions employ motion verbs such as ‘his death is *approaching* (moving time metaphor) or ‘he is *nearing* his death’ (moving ego metaphor). These metaphors appear in language as an easy way of expressing the ‘nested’ nature of the embedded perspective, wherein at later times what was previously (i.e. earlier) represented as open for deliberation, is represented as fixed and decided.

Hence the idea is that both the inferentialist and the misdescriptionist can appeal to this strategy for explaining why it is that we have passage-friendly language: a strategy that does not, in turn, appeal to our believing that there is temporal passage (or to there being temporal passage).

Of course, there is more work to be done here. Veridical passage theorists might argue that the best explanation for our having these kinds of embedded perspectives is there being temporal passage. Perhaps, for instance, the reason that later perspectives have memories of earlier perspectives, rather than the other way around, has something to do with temporal passage. Nothing I have said here countervails that reasoning. Nevertheless, I see no reason to suppose this is true. As long as temporally asymmetric phenomena such as causation, memory, knowledge, and records more generally, can be explained without appeal to temporal passage (as many suppose they can) then there being *nested* embedded perspectives of this kind can be broadly thought to be the result of there being these temporally symmetric phenomena. It’s also worth noting that phenomenal illusionists also suppose there to exist these embedded perspectives, so considerations such as these do not militate in favour of that view over cognitive error theory: at best they militate in favour of veridical passage theory. But that view, of course, faces its own problems in understanding what passage could be, within the constraints of extant physical theories.

**5. Conclusion**

The veridical passage thesis, phenomenal illusion thesis, and cognitive error thesis, all face significant explanatory challenges. The aim of this paper has been outline the cognitive error thesis—a relatively new view in town—and present it as a viable contender alongside the other more common views.

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1. Price (1997); Callender (2017). [↑](#footnote-ref-2)
2. Defenders of this view include Craig (2000) and (2001), Gale (1968), Hestevold (1994), Maudlin (2002), Maudlin (2007), (though what Maudlin means by time’s passing is somewhat different from what other authors mean) Norton (2010), Prior (1968), Schuster (1986), Smith (1994) and Zimmerman (2005, 2008). [↑](#footnote-ref-3)
3. Leaving it open that *sometimes* our phenomenology might be illusory, or otherwise mistaken. [↑](#footnote-ref-4)
4. Prosser 2007; 2012; 2013 defends the conditional claim that were there passage, our phenomenology would be illusory because we would be failing to track said passage. That is not to defend Phenomenal Illusionism, since it is consistent with the claim that, in fact, we do have experiences as of passage at all. [↑](#footnote-ref-5)
5. Though for somewhat different purposes; Hohwy et al aim to explain why our temporal phenomenology is *as of* passage, though they use the phrase ‘*temporal flow*’ instead of *‘temporal passage’*. [↑](#footnote-ref-6)
6. Following Baron et al (2015) this view is sometimes also known as veridicalism, since it holds that our phenomenology has veridical, not illusory, content, it is just that said content is not as of passage. [↑](#footnote-ref-7)