

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)**ScienceDirect**

Procedia - Social and Behavioral Sciences 126 (2014) 48 – 57

---

---

**Procedia**  
Social and Behavioral Sciences

---

---

ICTTP 2014

# How philosophical models explain time consciousness

**Bruno Mölder\****University of Tartu, Ülikooli 18, 50090 Tartu, Estonia*

---

**Abstract**

This paper analyses explanations provided by current philosophical models of time consciousness. These models attempt to explain temporal experience by describing the mechanisms of time consciousness in experiential terms. I criticize this practice on two grounds; firstly, it relies upon folk notions that have no clear individuation conditions and secondly because it often merely names, but does not explain the phenomena.

© 2014 The Authors. Published by Elsevier Ltd. Open access under [CC BY-NC-ND license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

Selection and peer-review under responsibility of the Organizing Committee of the International Conference on Timing and Time Perception.

*Keywords:* Time consciousness; Specious present; Phenomenology; Overlap model; Extensional model; Retentional model

---

**1. Introduction**

The aim of this paper is to examine current philosophical accounts of time consciousness. It is not my purpose here to find out which one of those accounts is on the right track. Instead, I look critically at the whole debate, trying to clarify what it is that a philosophical account ought to achieve and whether existing models are successful in fulfilling this task. I explore the idea that a philosophical model is intended to provide an explanation. After outlining the main accounts (section 2), I compare them with major theories of explanation in order to ascertain what kind of explanation the philosophical models offer (section 3). The last part of the paper (section 4) provides a critique of some features of explanation these models supply.

---

\* Corresponding author. Tel.: +37 27376619

E-mail address: [bruno.moelder@ut.ee](mailto:bruno.moelder@ut.ee)

## 2. Philosophical models of time consciousness

What is the purpose of a philosophical model of time consciousness? Let us begin by reviewing the main models or theories as they are discussed in the current philosophical literature. Usually, the models are presented as an answer to the problem of explaining how we can experience various temporal features of events. We are aware of change and motion, succession and the temporal order of events and other such features which either take time to happen or involve temporal structure. The philosophical question is then what is it about our consciousness that makes such experiences possible? How does our consciousness work? In addition, it is often noted that models of time consciousness should respect certain phenomenal properties of consciousness; namely its continuity and unity.

To set the stage for the subsequent analysis, in this section I will outline the main philosophical accounts as they are usually construed (see e.g., Dainton, 2008a,b, 2010, 2013; Gallagher, 1998). Since the terminology in this area is still somewhat unsettled, I adopt the terms used by Dainton (2010) in his authoritative encyclopedia article. There, he distinguishes between three major approaches: the Cinematic model, the Extensional model and the Retentional model. I'll describe each model briefly in turn at quite an abstract level.

### 2.1. *The Cinematic model*

As its name suggests, the Cinematic model relies on the parallel with technology used in making films, where a visible moving image is created by the rapid succession of static snapshots. On this model, consciousness operates according to the same principle. The experience of motion and change is made possible by the succession of contents, each of which represents one barely different phase of the moving object. These contents depict static scenes themselves. The appearance of movement results from the fast and successive presentation of these contents. One way to understand how this could work is to think of consciousness as pulsating. Each momentary pulse presents a different conscious content, but the fact that our experiences are made possible by the sequence of such pulses is not itself something accessible to one's consciousness. In this model, the mechanism that is supposed to account for time consciousness is the succession of snapshots in real time.

### 2.2. *The Extensional model*

The Extensional model treats experiences themselves as having temporal extension. The idea is that since experience is itself extended in time, it can present events that unfold in time or have temporal structure. Sometimes, the term that William James brought into currency, "the specious present," is used to denote this short period of time during which events that are experienced seem to occur now but not necessarily as simultaneous. This is possible, given that the experiential now is not an instantaneous moment, but it has a brief duration and can thus have non-simultaneous parts.

Different versions of this model have been proposed. One variant, which shares the idea of pulses with the Cinematic model, is due to Timothy Sprigge (1983). However, in his variant, the contents of the pulses are not static but instead present scenes with inherent dynamics. Each pulse involves an experience of change or movement. What does the work in this model are the temporal features already included in the contents of the pulses of consciousness.

Another version of the Extensional model has been presented by C. D. Broad (1923), who assumes the distinction between the act of consciousness and its content (or, as he calls it, the act of sensing and *sensa*). In his view, extended acts grasp extended contents, although the extension of the act need not be equal to the extension of the contents it grasps. What one grasps by the act is given to one as being present and, unless one looks at the static scene, it also appears as moving or changing, since the content involves an interval. To account for the continuity of consciousness Broad also allowed that the contents grasped by adjacent acts overlap.

---

<sup>1</sup> Sometimes the term "time consciousness" is used only in the phenomenological context, but I use it broadly so that it includes what has been elsewhere discussed under "temporal experience," "temporal consciousness," "experience of time," or "subjective time". I use "model" to mean loosely account or a theory, whereas in the philosophy of science it sometimes has a more specific meaning.

Dainton (2006) has recently developed a version of Extensionalism, the Overlap model, which is unique in that it dispenses with the act-content distinction. In this model, all experiential contents are already conscious; an additional act of grasping is not necessary. Contents that are part of the same specious present stand in a primitive experiential relation, which Dainton calls “co-consciousness”. To say that experiences or contents are co-conscious is to say that they are “being experienced together” (Dainton, 2006). In this model, the stream of consciousness is composed of specious presents which partly overlap; that is, they have parts in common. Thanks to this, adjoining phases of experience are also connected with the co-consciousness relation.

### 2.3. *The Retentional model*

The main tenet of the Retentional model is that temporal experience is enabled by contents that represent temporal intervals, whereas the representings or acts of consciousness are not extended in time. The extension represented in content is made possible by the compound structure of the act of consciousness, which involves besides the momentary experiential part also a kind of short-term memory that keeps hold of the past and, in some accounts, also a future-directed process of anticipation. Whereas the Extensional model accounted for the specious present by relying on an extended experience spanning in objective time, the Retentional model accommodates the specious present by placing it into the content of a conscious act, which itself can be momentary.

An influential Retentional model has been extracted from Edmund Husserl’s works (Husserl, 1991). According to it, consciousness has a three-part structure: each phase of it consists of a current *primal impression* of the experienced object, the *retention* of its previous, just-passed phase and the *protention* or the sense of the coming phase of the object. These make up the intentional structure of consciousness. In other words, the sense of temporal continuity is provided by adding the intentional presence of the earlier and later phases of the object to the primal impression. The real presence of past contents or sense-data is not required (see Gallagher, 1998 for details of Husserl’s account and its development).

## 3. What and how do these models explain?

Given this brief overview of the philosophical models of time consciousness, one may ask what the aim of these models is. A natural answer would be that they aim to explain time consciousness and do so under certain conditions of adequacy. But what is it about time consciousness that needs explaining? Often, the problem of time consciousness is presented as resulting from certain puzzles about the nature of time and temporal experience. For example, Kelly (2005) begins with the following puzzle: “How is it possible for us to have experiences as of continuous, dynamic, temporally structured, unified events given that we start with (what at least seems to be) a sequence of independent and static snapshots of the world at a time?” Similarly, Dainton (2013) identifies a “serious puzzle” with temporal experience: “how can we be aware of change and succession if our consciousness is confined to the present?” However, such puzzles can arise only after one has made certain specific philosophical assumptions, which need not be part of the phenomenon itself that requires explanation (see also Phillips, 2014). When I presented these models in the previous section, I did not bring out the philosophical principles such as “the principle of simultaneous awareness” or “the principle of presentational concurrence” (see Miller, 1984), since although they can undoubtedly constrain the ways these models are built, they are neither part of the *explanandum* nor are they those aspects of the model that do the explaining.

Let us for now simply proceed from the assumption that the task is to explain how we are aware of temporal features of events. What kind of explanation do these models provide? One way to look for an answer to this question is to compare the models of time consciousness with various models of scientific explanation. However, as we can see, they do not fit easily with those models. There are various accounts of explanation. Prominent among them are Carl Hempel’s deductive-nomological model, Wesley Salmon’s statistical relevance model and causal mechanical model, and Philip Kitcher’s unificationist model (see Woodward, 2002). Since it is quite obvious that the explanations provided by philosophical accounts of time consciousness are of a different sort, I can be fairly brief here. The *deductive-nomological* model analyses explanations as arguments that deduce the *explanandum* from the premises that contain the statement of a general law among other conditions. The models outlined above have a

different structure. They do not mention laws and cannot be easily turned into logical deductions. Neither can the *explanandum* be derived with a certain probability, so the *statistical relevance* model is also not applicable. The *causal mechanical* model takes explanation to be something that uncovers both those physical processes that cause and those causal processes that constitute the explained event. Although some elements in the time consciousness models may have a claim for being causally relevant, they do not fit with Salmon's (1984) understanding of causation as a mark-transmitting physical process. The *unificationist* model seems also better suited for an explanation of a different kind than those provided by theories of time consciousness. Its basic idea is that a good explanation unifies a large number of different kinds of phenomenon under a small number of laws and generalisations, whereas models of time consciousness are meant to apply only to our experience.

However, there is a recent approach to explanation that might be more suitable for philosophical models of time consciousness. This is the idea that the description of a mechanism can provide an explanation: the *mechanistic* explanation (Bechtel & Abrahamsen, 2005; Craver, 2007; Machamer, Darden, & Craver, 2000). The mechanistic account is primarily applied to explanations in molecular biology and neuroscience, but it might have a wider range of application. A mechanism as, for example, Machamer, Darden, and Craver understand it, is an ontologically real system composed of entities and their activities. A mechanism is made up of parts that interact in various ways and thus move the system from its initial state to its end state. Explaining the workings of a mechanism involves decomposing it into its parts and describing how the parts are arranged to compose the whole system as well as how they function. Depending on the components of the model, some explanations tell us how the system actually operates, while others tell only how it could possibly operate. Often the mechanisms span multiple levels that form natural hierarchies. Machamer, Darden and Craver elaborate by saying that those "levels in these hierarchies should be thought of as part-whole hierarchies with the additional restriction that lower level entities, properties, and activities are components in mechanisms that produce higher level phenomena." Levels are understood by philosophers very differently. Hence it is important to clarify the notion that is used in the case of mechanisms. Craver (2007) has made an effort to distinguish various notions of level from that of the levels of mechanism. He points out that levels in a mechanism relate entities in action, not just entities or activities in isolation, and that entities acting at lower levels compose higher-level acting entities by being organised through various spatial and temporal relations as well as by their activities.

Are models of time consciousness providing explanations in this sense? They do indeed appear to describe mechanisms in virtue of which we can experience temporal properties, at least on the surface. They describe components that interact in various ways to produce the consciousness of time. Even a kind of part-whole relationship can be detected between the consciousness as a temporal stream and the acts and contents that compose it. However, the analogy is by no means complete. Compare the mechanism of time consciousness with the workings of a synaptic connection, a favourite example of the proponents of mechanistic explanation. The latter is a biochemical mechanism, which components belong to several levels in nature. It is not clear that the entities referred to in philosophical models of time consciousness, acts and contents or experiences, have the same sort of robust biological or chemical reality comparable to that of the  $\text{Na}^+$  ions and receptors. Philosophical models also do not point to components at lower levels of composition. This would make little sense, since experiences and other mental acts are not composed of brain processes or neurons. So at best, philosophical models can be taken as mechanistic in an extended sense.

But perhaps philosophical models provide merely higher-level descriptions of phenomena, which could in principle be used for further theory-building at lower levels? In that case, descriptions in terms of acts and contents could be seen as specifying abstract roles, the implementations of which could be studied by neuroscientists. Note that if that is the case, we have moved away from the mechanistic model of explanation towards the account of *functional* explanation more prevalent in philosophy of mind. Although both accounts use the notion of a level, they use it differently (Craver, 2007; Revonsuo, 2001). In the functional case, the levels are not levels of mechanism but levels of realisation. Instead of a part-whole relationship, properties at different levels are linked by various realisation relations. In contrast to mechanisms and their components, the realised entities at higher levels do not have causal powers of their own as has been famously argued by Kim (1998), so if philosophical models of time consciousness describe higher-level processes and properties, these models cannot be regarded as providing a basic causal story. In any case, these models do not present a *reductive* functional explanation. A functional reductive explanation first abstracts the functional role of the phenomenon, then points to the suitable realiser that fulfils that

functional role and finally accounts for how the realiser plays its role (Kim, 2005). Philosophical models are silent about the realisers; they are developed relatively independently from the facts about the brain.

It is possible that the models give the non-reductive functional analysis, that is, specify the functional properties in isolation from their potential realisers. But presumably their proponents have stronger ambitions. Although there may be exceptions, it does not seem that they take their models as being limited to outlining functional descriptions only. Of course, this does not preclude treating those models as such and this might be one way in which they could be used outside of philosophy. However, when the goal is to find out what the philosophical models are meant to do in the eyes of their proponents, then I surmise that it is more correct to view them as being aimed at explicating the mechanism of time consciousness.

There is yet another option. Perhaps my whole attempt to determine the kind of explanation these models put forward is misguided, since they are not venturing into the business of explanation at all. Instead, they are *phenomenological* models and describe our experiences from the first-person perspective with the aim of uncovering experiential structures responsible for our phenomenal world. This is definitely how some philosophers may have understood their project. After all, one version of the Retentional model features prominently in Husserl's work, the father of phenomenology. However, the accounts as they are developed and discussed nowadays are removed from the original context of phenomenological research: the phenomenological reduction, attention to one's acts of consciousness and other such procedures. Also the Husserlian account has become a clarified and simplified model that is being compared with other accounts on conceptual grounds. The requirement that phenomenal data be taken into account is just one, albeit important criterion among others such as logical consistency and parsimony. Sometimes also the predictions about how temporal features appear to one in experience given the structure outlined by a model are derived and the models are compared on these grounds. That these models are meant to yield predictions suggests that they are expected to play the explanatory role, not just describe the phenomena.

When the phenomenological account uncovers structures that constitute consciousness, then it may well resort to theoretical constructs that themselves are not phenomenally manifest. This supports the point that such a model, even if phenomenological, could be regarded as explanatory, not wholly descriptive. It *explains* how it is possible for us to experience the world as we do. In doing so, it describes the structure of our consciousness, but that description is a theoretical account of the working mechanism of consciousness.

Gallagher (2003) and Dainton (2003) have disagreed over whether the segments of consciousness conceived as momentary in Husserl's model are "descriptive abstractions" or "theoretical posits". The first are mere artefacts of describing the stream of consciousness by a language, the latter being "entirely explanatory...invisible objects or processes, introduced so as to render features of consciousness that *are* detectable intelligible" (Dainton, 2003). Dainton argues that the momentary acts in Husserl's model are theoretical posits and presents this as a fault of the account. Dainton himself tries to use only those constructs in his model that are phenomenally manifest (even if not discernible as such). But even he takes his project to be one of explanation. After giving a phenomenological description of our experience, he continues: "So much for the phenomenological data. What experiential features and structures are needed to explain it?" (Dainton, 2004).

To round up this brief examination of the explanatory features of philosophical models of time consciousness, I conclude that although they evidently aim to provide explanations, none of the common models of explanation are readily applicable to them. However, they could be regarded as mechanistic explanations in a loose or extended sense. Namely, they purport to describe the mechanism of time consciousness but do so without stepping out from the phenomenological domain. In this regard, these models are phenomenological. They explain the invariant features of our consciousness in terms of overt and covert experiential structures. In doing so, they aim to answer some *how-possibly* questions about our experience but they are still far from giving *how-actually* explanations, which "describe real components, activities, and organizational features of the mechanism that in fact produces the phenomenon." (Craver, 2007).

#### **4. The explanatory poverty of some current philosophical models**

In the last and main part of this paper, I turn to the matter of how good the proposed explanations are. I develop some considerations to cast doubt to the explanatory strength of some of the main models. It should be noted that I

target only those “pure” philosophical accounts that have been developed in isolation from the empirical results of the neurosciences and psychology; the accounts that remain purely phenomenological.

There are various models of explanation, each with its own norms and conditions of adequate explanation. Given that the type of explanation that these models provide does not fit exactly with any common account of explanation, it would not be entirely fair to evaluate the philosophical models in terms of such adequacy conditions. Instead, I proceed from a general assumption that a good explanation should bring out the factors that really make a difference to the phenomenon to be explained. The constructs used in the explanation should correspond to real entities that play a causal role in producing the phenomenon under explanation. I find that there are reasons to doubt that the philosophical models achieve this. My reasons fall into two broad regions. The first is the worry that instead of singling out the real kinds, the models rely on folk notions and their successors that either fail to apply in the required context or have arbitrary individuation conditions. The second reason is that the proposed accounts simply name the *explanandum* as opposed to properly explaining it and thus fail to uncover the real causal mechanisms.

#### 4.1. *Folk kinds with arbitrary boundaries*

The current debate makes an uncontested assumption that the structure of time consciousness is to be explained by using our common-sense or folk psychological vocabulary and its refinements, for example, terms like “experience” or “memory”. Although these terms are proper in everyday contexts, their usefulness may be limited when explaining the very fine structure of time consciousness. One reason for this is that terms that are tailor-made for use on a given scale may become inapplicable when applied to entities that appear on other scales. For instance, Dennett (1991) famously argued that the clear distinction between memory and experience may break down on the millisecond magnitude. In this regard, it is hard to see how experiences and memories could properly be part of the basic mechanism that yields consciousness. Although Dennett developed this line of thought in the context of his controversial Multiple Drafts model, I assume that this point is plausible also when considered separately from his specific views on consciousness.

The second reason for suspicion towards using folk psychological categories to build explanatory models relates to the potential cross-classification between the common-sense terms and those used in empirical sciences. We should not expect that the folk terms, however entrenched they might be, will map precisely into the conceptual classification of, say, cognitive neuroscience. It has been pointed out that memory, which seems to be a unitary faculty for common sense, turns out to be much more variable, when viewed through the lens of empirical memory research, so that it cannot be regarded as a natural kind (Michaelian, 2011). The same doubts could be entertained about experience. Given that experiences come in different modalities and have so many different aspects that could be examined in a bewildering variety of ways, it is perhaps premature to expect that such a construct will be retained in various relevant empirical sciences without modification. I am not claiming that in the case of the conceptual mismatch, the philosophical model should be discarded. This is not an eliminativist argument. I am claiming only that in such a case, a philosophical model couched in terms of memories, experiences and relations between experiences is of limited value. It cannot be easily integrated with the work done in other sciences and if one wants to draw some predictions from it that could be confirmed experimentally, not just phenomenologically, then it requires substantial interpretation. Such a philosophical model is like a stand-alone gadget that might be fun in itself but it cannot be linked to other devices.

An additional trouble with experience is that when moved from its common-sense context to philosophers’ hands, it turns out that its individuation conditions are arbitrary. The usual assumption is that the stream of consciousness is composed of various experiences. But what makes it the case that what I am having right now is one experience and not two or three? There is no generally accepted answer. A drastic example is Tye (2003), who adopts the view that “for each period of consciousness, there is only a single experience.” Dainton, on the contrary, holds that experiences can be individuated in various ways and that there is no single right principle governing it. According to such “flexible policy” as he calls it, “[a] complete momentary cross-section of a stream is an experience, the complete content of a stream over a given interval is an experience, any combination of co-occurring contents within a stream is an experience...” (Dainton, 2006). Thus, no matter how closely one looks at the stream, what one finds there can be regarded as experience. Dainton also makes a remark that could be seen as providing a reply to previously outlined doubts about experience. He notes that even if we do not take the basic building-blocks

of philosophical models to be experiences, the basic structural puzzles stay on nevertheless. We would only call them with different names, but there is still the task of explaining how the stream of consciousness is composed of its parts:

Irrespective of whether we call them ‘experiences’ or not, our streams of consciousness typically contain many discernible *parts*, *regions*, or *aspects*. Some of these parts are related in a distinctive way—they are experienced together, they are phenomenally unified—and others are not. ... The task of saying what can be said about this distinctive mode of unity thus remains, irrespective of whether we prefer to say that it is to be found within rather than between experiences. (Dainton, 2008b, pp. 72-73).

This is true, and it may well help to disengage philosophical theorising from folk psychology. However, note that the proposed explanations would still use a limited set of tools and building-blocks. Acts of awareness that grasp contents or certain phenomenal relations between parts of consciousness are still taken to be explaining how time consciousness works. But why expect that the explanation of consciousness in those terms is illuminating? I’ll return to this issue in the next section.

Here I argue that the fact that there is no non-arbitrary ground for individuation of experiences (or parts of consciousness) is a problem even for a “flexible” account. Intuitively, if there are no facts of the matter about the spatial and temporal location of an entity, it cannot turn the cogs in the machine. The point is not that the boundaries are metaphysically blurry or vague; it is rather that they are not there independently of our contingent interests. This afflicts the Extensionalist models of Broad’s kind, for if the division into experiences is arbitrary, then the length of the acts and which contents they grasp also becomes arbitrary. Dainton’s proposal does not offer a remedy here. His idea is that whichever part of consciousness we take into consideration, we can still find crucial overlapping structures and the relation of co-consciousness. In his Overlap model, the contents of which one is aware together are specious presents and specious presents are connected into the stream of consciousness thanks to the overlap between their parts. In accordance with the relaxed terminological policy, he can use “experience” for all those elements: contents, specious presents and even streams of consciousness. But the issue of individuation crops up again, in a different guise. Let us grant that “experience” is just a term and the explanatory work is done by other constructs such as specious presents, overlap and co-consciousness. Still, for them to have any real effects on the mechanism of consciousness there should be non-arbitrary facts about when one content ends and another begins, which contents belong to which specious presents, what is the length of overlapping parts and exactly how many overlapping specious presents are there in any given extent of time. Until we have a principled basis for making those distinctions, the model is not precise enough.

A similar problem can also be seen also in Retentionalist models that distinguish between acts and contents. There is no clear and generally accepted ground for individuating acts of consciousness. How many acts of consciousness did I have during the last minute? I am not sure there is any good non-arbitrary answer.

#### 4.2. *Explanation by naming*

If we adopt the assumption that philosophical models strive to be explanatory, then they become susceptible to the criticism that the explanations provided are not very good. Reading the descriptions of the models generates the uneasy feeling that the expected elucidation of the phenomenon was not supplied. Instead of explaining, they merely describe the *explanandum* in a different way. They provide an “explanation by naming” as it is sometimes called. But generally, phenomena are not self-explanatory. That uneasiness has also been felt by others: for instance, Kelly (2005) levels a similar criticism at Husserl’s model. More often, however, such criticism is targeted at Dainton’s account of co-consciousness and flowing character of experience (e.g., Chuard, 2011; Gallagher, 2003; Phillips, 2008; Prosser, 2012). Let us take a brief look at Dainton’s model again to see if such an objection is justified.

---

<sup>3</sup> Dainton (2006) cites some empirical considerations about order and coincidence thresholds in humans, but I don’t think that this answers my worries about the individuation of the crucial elements of his model.

As already noted, Dainton's Overlap model (Dainton, 2003, 2006, 2008b) aims to account for our experience of change as well as the phenomenal continuity and flow of consciousness. Change can be experienced, since experience involves short extensions, specious presents. Contents in a specious present are experienced together, in Dainton's terms, they are co-conscious. To guarantee continuity, the specious presents are made to overlap in the model. This means that they have common parts and not that parts of them are on top of each other. In that way, there are no gaps between specious presents, for the overlapping parts give rise to a further specious present. Dainton (2008b) claims that this specious present "exists, but it is wholly composed of" the respective parts of adjacent specious presents. This additional specious present involves again co-conscious contents, and thus the whole stream is linked together by the relation of co-consciousness. To accommodate phenomenal flow, Dainton (2006) postulates that an "intrinsic dynamic patterning" is contained in the very content of experience.

We can see from this description that in several cases, the phenomena in need of explanation are either named in novel ways or replaced with other relations and structures. It remains, however, only a stipulation that these structures indeed constitute the phenomenon. For instance, co-consciousness is meant to secure the unity and continuity of consciousness, but it is only unpacked as contents that are experienced together. At the same time, unity is contents experienced together in a short interval of time and continuity is understood as a chain of intervals of contents, each of which is experienced together with the previous and the next one. Basically we are told that contents are experienced together since they are related with the relation of "being experienced together". Overlap performs the task of securing an additional specious present so that the co-consciousness relation could hold also between parts of specious presents, which would otherwise be unrelated. But does it really make a difference? It seems more like something that is postulated in order to make the co-consciousness relation applicable. Also the specious present that thereby comes to exist is suspect. It has no unique parts, for all its elements belong also to other specious presents. Finally, the intrinsic dynamic, which remains a primitive construct in the Overlap model, is just the very phenomenon – phenomenal flow – with a different name. In his reply to Prosser's (2012) similar objection, Dainton (2012) notes that phenomenal flow is a "basic and so irreducible feature of our experience" that it cannot be given "a more detailed explanation" at the level of experience. This might be acceptable if the account merely described the phenomenon, but when the aim is to provide an explanation, this does not suffice.

Dainton (2003, 2008b) maintains that the overlap structure can be experienced, not as such, but it manifests itself in the continuous nature of experience. The claim seems to be that since our experiences flow in a continuous manner, we are aware of the structure that enables this continuity. However, unless there are independent reasons for thinking that this structure in fact constitutes our experiences, this kind of reasoning simply begs the question.

Perhaps the practice of naming rather than explaining is based on a tacit assumption that is well expressed but not endorsed by Chuard (2011): "any phenomenologically salient characteristic warrants positing some corresponding feature to explain why things seem the way they do...". But postulating a feature amounts to nothing more than setting up an *explanandum*.

It might be objected that mechanistic explanation works in that way too: its explanation consists of a description of the mechanism. However, the contested descriptions in philosophical models are different. Those cases that merely re-name the phenomenon in need of explanation cannot be seen as explicating the mechanism even if one assumes that the mechanism must be found in the structural description of experience. After all, there is a difference between naming the phenomenon and describing what does it consist of.

Beside the above-mentioned fault, the accounts proposed by philosophical models assume that time consciousness should be explained with a limited range of relations and elements. Those elements are assumed to play a causal role, but there is no good account of how they could have such a role. For example, those Extensional and Retentional models which work with the act-content distinction take it for granted that grasping contents with an act yields awareness of those contents. But this is just an artefact of the theoretical distinction between acts and contents. It fails to single out the causal mechanisms of awareness. As concerns Husserl's model, it has been pointed out that both the instantaneous threefold phases of consciousness as well as the momentary primal impression are abstracted from the live stream of consciousness (Gallagher, 1998, 2003; Zahavi, 2007). It does not matter whether they are theoretical constructs or innocent but unavoidable abstractions. The present worry is that it is difficult to see



how an abstraction could play a causal role in maintaining consciousness of time. Of course, this presumes that this model is to be viewed as attempting to explain how consciousness works, a presumption that many phenomenologists do not share.

I have not discussed the Cinematic model separately in this paper. This is partly because it is not very popular among philosophers. A fault with this model is often seen in that it does not explain how separate pulses are bound together (e.g., Dainton, 2010). It is true that the model does not include a separate binding construct but even if it did that would not be sufficient. This would be just another case of positing without explaining. The account given by the Cinematic model is very lean at the level of experience. On the other hand, perhaps that is something we should learn from this model. It takes the explanation to the level below the experience and shows that the phenomenal unity and continuity could be a product of non-experiential or neural multiplicity. Perhaps the extent to which we can explain time consciousness in terms of phenomenal relations and constructs at the level of experience is indeed limited, given that such explanations are not really illuminating? Perhaps the proper explanation should be given in terms that go beyond the experiential? As the problem of the relation between the experiential and the non-experiential is beyond the scope of this paper, I do not want to take a stand on this issue here, but it is one possibility that could be considered.

## 5. Conclusion

Some current philosophical models are problematic when taken as attempts to explain the mechanism of time consciousness. They remain at the phenomenological level, trying to formulate the structures responsible for our consciousness of time in folk psychological terms, which need not apply to processes occurring in the millisecond range or which lack non-arbitrary conditions of individuation. They also often just describe the phenomenon in a different way instead of explaining it. Given all this criticism levelled at philosophical models in this paper, I do not, however, intend to claim that we should abandon philosophy when it comes to temporal experience. We should perhaps only reckon that building a philosophical model at the level of experience does not give us the whole mechanism of how we experience change and other temporal properties. It is likely that the real causal mechanism is to be understood with the help of empirical psychology and neuroscience and the role of philosophy is more modest than one might want to assume.

## Acknowledgements

I am grateful to Alexander Davies for checking my English. This work was supported by the COST Action TD0904 (Time in Mental Activity) and a grant ETF9117 from the Estonian Science Foundation.

## References

- Bechtel, W., & Abrahamsen, A. (2005). Explanation: a mechanist alternative. *Studies in History and Philosophy of Biological and Biomedical Sciences*, 36, 421-441.
- Broad, C. D. (1923). *Scientific thought*. London: Kegan Paul.
- Chuard, P. (2011). Temporal experiences and their parts. *Philosopher's Imprint*, 11 (11), 1-28.
- Craver, C. F. (2007). *Explaining the brain: mechanisms and the mosaic unity of neuroscience*. Oxford: Clarendon Press.
- Dainton, B. (2003). Time in experience: reply to Gallagher. *Psyche*, 9 (12), 1-71.
- Dainton, B. (2004). Précis: Stream of consciousness. *Psyche*, 10 (1), 1-29.
- Dainton, B. (2006). *Stream of consciousness: unity and continuity in conscious experience*. 2nd ed. London & New York: Routledge.

---

<sup>3</sup> It should be added that Gallagher (1998) interprets retention and protention not as parts of the acts of consciousness, but as their “functions” or ways of “performance”. This prevents extending the objection to these activities, but the problem with the idea of the instantaneous phases remains if those are to be seen as playing explanatory role. Note that this interpretation suggests that Husserlian model can also be seen as providing a functional description instead of describing the actual or possible mechanism of time consciousness.

- Dainton, B. (2008a). Sensing change. *Philosophical Issues*, 18, 362-384.
- Dainton, B. (2008b). *The phenomenal self*. Oxford: Oxford University Press.
- Dainton, B. (2010). Temporal consciousness. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy (Fall 2010 Edition)*.
- Dainton, B. (2012). Time and temporal experience. In A. Bardon (Ed.), *The future of the philosophy of time* (pp. 123-148). New York: Routledge.
- Dainton, B. (2013). The perception of time. In H. Dyke & A. Bardon (Eds.), *A companion to the philosophy of time* (pp. 389-409). Chichester: Wiley-Blackwell.
- Dennett, D. C. (1991). *Consciousness explained*. Boston: Little, Brown.
- Gallagher, S. (1998). *The inordinance of time*. Evanston, IL: Northwestern University Press.
- Gallagher, S. (2003). Sync-ing in the stream of experience: time-consciousness in Broad, Husserl, and Dainton. *Psyche*, 9 (10), 1-20.
- Husserl, E. (1991). *On the phenomenology of the consciousness of internal time (1893-1917)*. Trans. J. B. Brough. Dordrecht: Kluwer Academic Publishers.
- Kelly, S. D. (2005). The puzzle of temporal experience. In A. Brook & K. Akins (Eds.), *Cognition and the brain: The philosophy and neuroscience movement* (pp. 208-238). Cambridge: Cambridge University Press.
- Kim, J. (1998). *Mind in a physical world: an essay on the mind-body problem and mental causation*. Cambridge, MA: MIT Press.
- Kim, J. (2005). *Physicalism, or something near enough*. Princeton: Princeton University Press.
- Machamer, P., Darden, L., & Craver, C. F. (2000). Thinking about mechanisms. *Philosophy of Science*, 67, 1-25.
- Michaelian, K. (2011). Is memory a natural kind? *Memory Studies*, 4 (2), 170-189.
- Miller, I. (1984). *Husserl, perception, and temporal awareness*. Cambridge, MA: MIT Press.
- Phillips, I. (2008). Perceiving temporal properties. *European Journal of Philosophy*, 18 (2), 176-202.
- Phillips, I. (2014). The temporal structure of experience. In V. Arstila & D. Lloyd (Eds.) *Subjective time: philosophy, psychology and neuroscience of temporality*. Cambridge, MA: MIT Press.
- Prosser, S. (2012). Why does time seem to pass? *Philosophy and Phenomenological Research*, 85 (1), 92-116.
- Revonsuo, A. (2001). On the nature of explanation in the neurosciences. In P. K. Machamer, R. Grush & P. McLaughlin (Eds.), *Theory and method in the neurosciences* (pp. 45-69). Pittsburgh: University of Pittsburgh Press.
- Salmon, W. (1984). *Scientific explanation and the causal structure of the world*. Princeton: Princeton University Press.
- Sprigge, T. (1983). *The vindication of absolute idealism*. Edinburgh: Edinburgh University Press.
- Tye, M. (2003). *Consciousness and persons: unity and identity*. Cambridge, MA: MIT Press.
- Woodward, J. (2002). Explanation. In P. Machamer & M. Silberstein (Eds.), *The Blackwell guide to the philosophy of science* (pp. 37-54). Oxford: Blackwell.
- Zahavi, D. (2007). Perception of duration presupposes duration of perception – or does it? Husserl and Dainton on time. *International Journal of Philosophical Studies*, 15 (3), 453-471.