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RETAINING RETENTIONALISM.
A DEFENCE OF A TENSELESS ACCOUNT OF PERCEPTUAL EXPERIENCE

Tesi di Dottorato di
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Table of Contents

Introduction

We perceive motion, we perceive qualitative change, we perceive things resting. It is an uncontroversial datum: we are able to do it and to react to things that indeed move, change and rest. However, there is something deeply puzzling in that, and philosophers like William James (1980), Edmund Husserl (1928/2014), Franz Brentano (1874), Charles Dunbar Broad (1927), not to mention John Locke (1689) and Thomas Reid (1975), were well aware of the philosophical conundrums behind our ability to perceive motion, change and persistence[1].

Firstly, these events, which are general enough to encompass all the other kinds of events, trivially require time to unfold. There cannot be an instantaneous persistence, an instantaneous motion or instantaneous change. So, these events necessarily require an unfolding of phases to exist. In this respect they are different from mere instantaneous states of affairs, like the sudden appearance of a statue that comes to be annihilated just after. Since I am not sure that cases like the appearance of the statue can be considered events in the first place, but I still want to distinguish motion, persistence and change from instantaneous events, I will speak about temporal events, or t-events, in order to refer to motion, persistence and change.

Secondly, it is the temporal extension of t-events that generate philosophical perplexity. And the perplexity arises from our ability to perceive t-events not just as if they were chaotic blurs: most of the time we are clearly able to perceive the various temporal relations among their phases. For example, we may perceive that a ball was near to the striker *before* he kicked it toward the goal. We may perceive that some water inside a pot is boiling *for* two minutes. This suggest that there are *temporal properties* structuring the t-event and, in virtue of perceiving those properties, we are able to perceive the unfolding of the t-event, instead of a confuse blob. In the two examples, the temporal properties under issue were *temporal order,* in the case of the striker, and *duration* in the case of the boiling water. Both *order and duration* are cross-temporal relations, since they relate two phases of the same t-event occurring at different times. Temporal order determines the sequence in which the phases unfold according to a

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[1] I suggest Andersen and Grush (2009) for a historical discussion about this topic.

certain direction of time, duration measures the "temporal distance" between the two phases.

Another cross-temporal relation is succession*,* which is the opposite of *synchronicity or simultaneity.* When two phases of a t-event are synchronous, they occupy the same position in time. On the opposite, if they were *successive,* they occupy two different temporal locations. It is worth to point out that for our purposes we should make a distinction between succession and temporal order: there are empirical data (e.g. Hirsh and Sherrick 1961, Mitrani, Shekerdjiiski, Yakimoff 1986) showing that in some circumstances we are able to perceive two stimuli as not simultaneous, even if we are not able to assess their order. Strictly speaking, simultaneity is as a degenerated case of cross-temporal relation, in which the two temporal locations of the two phases collapse into one. However, in order to avoid ambiguities involving simultaneity, I will not speak about cross-temporal relations, but simply of temporal properties or temporal relations.

Now we are able to formulate the philosophical puzzle in all its nature. T-events require temporal relations, so, it is only in virtue of perceiving temporal relations that we can be aware of the unfolding of a t-event. However, the minimum requirement for a relation to be perceived is that all *relata* are presented in the same content of the same perceptual act. But this comes to be an *impossible* perception, if we are guided by the idea that our perceptual content delivers only one instant each time. So, in brief, "*how is it possible to perceive temporal properties?*" is the question I am trying to answer in the first four chapters of this dissertation: my aim is to provide reasons to show why my Tenseless Retentionalism is a good option in contrast to other proposals advanced in contemporary literature.

The assessment of the various theories discussed nowadays (Resemblance Theory, Memory Theory, Retentionalism, Overlap Model, Naïve View) discloses at the hart the reason why the perception of temporal properties is interesting in respect of the field of philosophy of perception more generally. All these theories share an assumption: they all admit that the temporal properties of the vehicle have an impact, an explanatory role, in our account of the ability to perceive order, duration, succession and synchronicity of t-events. Every theory exploits different properties of the vehicle in their purposes, but the core assumption is always shared and the reason is simple: in no

other case there is philosophical consensus on the fact that both contents and vehicles share the same kinds of properties. To put it crudely, our perceptual experience of a red patch is not red, while our perceptual experience of something having duration seems to have a duration itself and, according to the ordinary way of thinking….it has the very same duration of the t-event we are perceiving! That is why the perception of temporal property is a *unicum* in philosophy of perception.

However, by "experience of time" we mean something more sometimes. The perception of temporal properties, and by extension of t-events, does not exhaust what people refer to as the *feeling of the passing of time.* Indeed, one thing is to perceive a moving object, quite another is perceiving that time itself "moves" somehow. This opens up another debate that, as we will see, is connected to the first one (even if the connection itself has been largely underappreciated). Time is a dimension of reality, like space, but philosophers (Le Poidevin 2007, Schlesinger 1991, Davies 1996) maintain that our perceptual grasping of it is quite different than space's. Many of the great philosophers in the past like Kant (1782) and Husserl (1928/2014) agreed. Indeed, it seems to us that while space stands still and it is filled by objects, time has a *transient/flowing* character responsible for its directionality. We cannot go back in time, but we can go back to our starting point is space.

That time flows means essentially two things: 1) that people perceive a certain moment, *i.e.* the present moment, to be privileged (indeed we do not have access to points in time other than the one we are in, while it seems easy to get access to other points in space, different from the one we are currently occupying) and 2) that people feel a change in which instant is the present moment (Hoerl and McCormack 2018). I will refer to the privileged present and the flowing character of time as *the features of time,* as opposed to *the temporal properties* of t-events*.* My goal in the fifth chapter is to show that there is nothing like the perception of the features of time, contrary of what it is standardly assumed, especially by metaphysicians believing that the features of time are real. Thus, the inquiry about the perception of time features should be of interest also for metaphysicians debating the nature of time itself.

These are all my remarks in order to show why I believe that this topic, *viz.* the perception of time features and temporal properties, is interesting. In what follow I will

offer a characterisation of the structure of this dissertation and after that I will provide a glossary in order to orient the reader. We have already encountered some terms like "temporal properties" and "t-events", but since it may be the case that I use some terms in an idiosyncratic way, I prefer to make myself clear from the beginning. After the glossary, the dissertation is so structured: it is composed by fifth chapters and a small conclusion at the end. Every chapter is completed with an APPENDIX. APPENDIXes are not mandatory for the reader to understand my position, but they provide further information about some topics developed in each chapter. The first four chapters will be devoted the problem of the perception of temporal features. The fifth one will switch to the perception of features of time

In chapter 1 I will explicitly state the philosophical problem posed by the *Paradox of Temporal Experience* and its implications. I will devote the whole discussion to assess all the various assumptions and principles that have been advanced in order to solve it or to constrain the way in which a good solution should be like. I will be critical against some of them, *e.g.* Dainton's (2000) strong continuity or the immediacy thesis. I will argue that they should not be taken into account. I will end up recommending framing the debate in terms of the acceptance or rejection of some principles like the *Principle of Simultaneous Awareness* (section 1.6) and/or *Metrical Mirroring* (section 1.7).

In chapter 2 I will analyse the first kind of family apt to solve the Paradox of Temporal Experience, namely the one composed by the Deflationist Models. The Resemblance Theory, the Dynamic Snapshot view and the Memory Theories will be discussed in their points of strength and weakness. I will end up rejecting those models in favour of the admission of a Specious Present View.

In chapter 3 I will take into account the Specious Present Theories, namely those theories admitting a perceptual content with a certain temporal depth. After a theoretical and empirical evaluation of the idea of the Specious Present (section 3.1), I will start evaluating both Specious Present proposals: Extensionalism and Retentionalism. The discussion about Extensionalism, my main polemical target, will occupy all the central section (3.2) of the chapter. I will analyse the various forms of Extensionalism, the Overlap Model and the Naïve View, and I will underline the problems they have at delivering a satisfactory account of the specious present. The last section of the chapter will be an introduction of the family of theories mine is part of:

Retentionalism. I will especially focus on the problems of Retentionalism, which are to be solved in Chapter 4.

In chapter 4 I will heavily rely on the notion of temporal transparency in order to argue for my personal version of Retentionalism: Tenseless Retentionalism. I will start from some considerations by Extensionalists in order to provide a model of Retentionalism able to account for every challenge and, contrary to the mainstream view, able to accommodate *Naïve Realism*. I will close the chapter by providing some speculative tools to understand a possible implementation of my theory in the brain.

In chapter 5 the discussion switches to the problem of perception of the features of time. I will show that the debate about temporal properties constraints sensibly some of the proposals. For example, no specious present is able to deliver the flowing-like character of time philosophers are after. After dismissing all the proposals about the perception of features of time, I will provide reasons to drop the idea that there is anything like perceiving the features of time in the first place.

Glossary:

- **Act of Perception:** a single, minimal, act of sensory awareness sufficient to deliver some phenomenology to the subject. It has to be opposed to the **stream** of consciousness, which I take to be the sequence of *multiple* acts. In this context there is no need to assume a *common factor* between veridical perceptual phenomenology and illusions or hallucinations (cf. Soteriou 2014, 2016). The Disjunctivist may translate every talk about acts of perception in a jargon involving also illusions and hallucinations. That is why I will simply refer to "perception" with no further specifications.

- **Content**: I'll take a minimal notion of content. Indeed with "content", I simply mean *what* a perceptual experience is a perceptual experience *of*. I am not committed to a notion of content involving accuracy conditions. So, every theorist of perception (representationalist, naïve realist, sense-data theorist) can accept my line of reasoning. However, I will be explicitly when this neutrality falls apart. Contents are given to the subjects in virtue of their neural realisation (which is carried out by the **vehicle**). Given this minimal characterisation, the content is almost always sufficient alone to capture the phenomenology of phenomenal character of any perceptual experience, regardless on the theory of general perception in play. See the voice "vehicle" for a discussion on the only exception to this rule.

- **Experience**: I will try to avoid this term without further specifications (*e.g.* "perceptual experience"). Indeed, our focus is on perception and it may be misleading to refer to "experience" in general, since it remands to other phenomenal states. However, because of that, I will sometimes make a distinction between "**perceptual experience**" (*strictu sensu*) and "experience *latu sensu*", meaning that the latter, but not the former, involves phenomenal states other than perception alone.

- **Features of time**: the privileged status of the present and the flowing-like character of time. They are taken to differentiate time from space, since the latter has no privileged "here" and it does not seem to move.

- **Perception (or "perceptual experience")**: a mental state or process making the subject aware of the composition of the immediate environment. It is characterised by a phenomenology. It is opposed to other mental states of processes, like emotions, memory, beliefs and desires. Some of these latter states or processes are still phenomenal in character, and they sometimes go under the label of "**experience *latu sensu***" (in order to distinguish them from perception proper).

- **Stream**: the sequence of acts of perception that characterises our wakeful life. It is composed by multiple **acts**.

- **Temporal Property/Temporal Relations**: they are relations connecting different phases of a t-event. They are *Synchronicity* (or *Simultaneity*), *Order, Succession and Duration*. Since they structure the t-event, their perception is what allows us to perceive the t-event itself.

- **T-event**: an event involving Motion, Change or Persistence. It has to be distinguished from instantaneous states of affairs.

- **Vehicle**: a neural realiser apt to implement the act of perception. Since I take every theory of perception to allow the brain to do that, I take every theory of perception to be committed to the vehicle/**content** distinction (*pace* Adverbialism). Bearing in mind that this is the notion of vehicle I rely onto (and it is the original one by Dennett and Kinsbourne 1992), in the history of philosophy this notion has been loaded with a heavy-weight terminological bargain. For example, properties that within the introspection may be recognised as being mind-dependent, are sometimes taken as "vehicle-properties". An example that will be discussed in chapter 4 is about tenses: these are sometimes considered properties of the vehicle, but they are not directly related to neural implementation. The acceptance of these loaded "vehicle-properties" brings about the only case in which the phenomenal character is not completely exhausted by the **content** alone. The obvious complication is that properties of this sort are not acceptable by some theories of perception like Naïve Realism. I will be explicit when this is the case and I will be careful in explaining the consequences.

Chapter 1: The Paradox of Temporal Experience and Its Principles

1.1 The Paradox of Temporal Exprience

I am looking at the car running on the track, it quickly changes its position along the circuit. My gaze rests to the empty seat in front of me. It remains still all the time. I turn my head to the right, I get aware of my ice-cream melting: a little drop is flowing down.

I have just described three common experiences: the perception of a movement (the car), the perception of a persisting object, (the seat) and the perception of change (the ice-cream). As common as they may seem, they are a source of puzzlement for philosophers. Indeed, our ability of experiencing change, persistence and movement is at the heart of the so-called *Paradox of Temporal Experience* (Kelly 2005).

> *"How is it possible for us to have experiences as of continuous, dynamic, temporally structured, unified events given that we start with what (it seems to be) a sequence of independent and static snapshots of the world at a time?"(Kelly 2005: 210)*

Let us unpack this a bit. Let us assume I am seeing the movement of a bowling ball rolling. I see it occupying subsequent positions on the lane. The movement of the ball appears smooth to me, like a 'continuous flow'. When I see the smooth movement of the ball on the lane, I am informed about the motion of the ball…just by *seeing it.* This is to say, I undergo a *unitary experience* of the ball rolling over the line, *i.e.* a unitary experience of an event unfolding over time. As Kelly (2005) suggests, this unitary experience is also temporally *structured and ordered*: I do not see the ball scattering randomly from the middle of the lane, to the pins, to the hand of the player. The ball moves with a clear, ordered trajectory from the hand of the player to the pins. Moreover, and above all, since we are dealing with motion, this experience presents its content with a *character* distinctive of the perception of moving objects in respect to objects resting.

So far so good, and the reader may ask what is puzzling about the paradox of temporal experience then. The answer is this: there is an intuitive sense in which what is presented to me in perception is something that occurs in the present moment. It seems I have no perceptive access to what happened in the past. It seems I cannot perceive things in the future either. Neither Julius Cesar, nor my children are available to my perception.

However, the most intuitive conception of the present moment takes it to be just *an instant*, and thus my perception is confined in an *instant*. Let us see this with another example. I am looking at the laptop in front of me for a brief interval of time, close to an instant. It is silver-coloured. The scene in front of me is occurring in *the present* in which the perceptual experience takes place. I may close my eyes for a while, and I may move my hands aside in the meantime. I open them again for another instant, I still see my laptop. I do not see my hands. It is still a unitary perceptual experience, but I am presented with a scene occurring at another specific *instant*, which is now *the present moment*. In this new present moment, there is no track of my hands' being on the laptop anymore. My hands were on the laptop some instants before, and now are no more present to my visual experience. If this is correct then, it seems that our basic perceptual acts are really snapshot like in the sense that they do present us with a scene taking place at *single instants* (the everchanging present)*, like the scenes immortalised by our photographs. But the risk is to undermine the unity of our sensory experience of *unfolding events,* like those involving things *moving, changing and persisting* (from here on, t-events)[2].

There are two sources of problems here. The first one related to the fact that our perception is confined in the *present moment.* The other one related to the fact that the present moment is instantaneous, *viz.* that perception represents the world as it is at a certain instant.

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[2] It is disputable that an event may be made of persisting things, due to their lack of qualitative change (Casati and Varzi 2015). I do not want to take a side on this metaphysical issue. Since I am interested in perception of changing, moving and persisting things, it is *prima facie* common to all these that they need time to unfold. For the sake of exposition, I speak about perception of "t-events" in a stipulative manner: it is the perception of what requires time to happen, whichever the correct metaphysical status is.

As Le Poidevin (2019) remarks, in perceiving "A then B", A is no longer present when I perceive B. It seems an impossible perception. Perceiving A is required to perceive "A then B", but it is not accessible to our perception due to its not being present anymore. In the same way, the temporal properties of the t-events (i.e. their duration, the internal order of their phases, the succession of their parts[3]) cannot be perceived. An event should be entirely in the past in order for us to have access to its duration. Moreover, it is not possible to perceive the internal order of the t-event and the succession of its parts: when we perceive a certain phase, the *previous* one is already in the past. The order is never given in the *present*.

The punctuated character of the present, provides also further troubles. It forces us to consider perception to give us the image of the world as it is at a *certain instant*. T-events do take time to unfold of course, and, if it is true that, at the end of the day, our acts of perception capture just one instantaneous phase of these unfolding events, then it is not clear how a unitary perceptual experience of smooth motion (let us say) may be delivered in our phenomenology. Motion is a unitary phenomenon involving relations of order and duration among its phases. However, the relations cannot be represented: to perceive the relation, both *relata* have to be presented to perception (cf. Chuard 2011; Mellor 1998). That is to say, in order to have unitary perceptions of t-events the relational constraint must be met:

The relational constraint: For any relation R, a subject S can perceive R between x and y only if S perceives both its relata x and y. (Chuard 2011: 3)

It is obvious that, if Kelly is right at depicting our perceptual experiences, the relational constraint is not met, and thus neither the unity of perception. What is worst, however, is that, since these snapshot-like perceptual experiences seem to present nothing moving. This for the obvious reason that in order to perceive a t-event like motion, it is necessary to perceive its internal temporal relations. So, the problem comes to be, in a

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[3] Cf. Pöppel (1997) The reason why the non-simultaneity is distinct from the temporal order is due to empirical reasons. Two stimuli presented with an interval of 30ms are judged to be not simultaneous but we are not able to assess for their temporal order.

sort of re-edition of the Zenonian paradox of the arrow, how it is possible to have a unitary sensory experience of movement, given that our perception delivers a series of disjointed snapshots representing non-moving objects[4].

Before going on, let me show a bit more how Kelly takes the paradox to be at the heart: indeed, he is clear at distinguishing the real paradox of temporal experience I have just mentioned from other two problems. Kelly (2005) claims these are still connected to how our sensory experience is related to time, but they are not, in his opinion, related to the paradox of temporal experience. They are:

> The **time stamp problem**: how do we come to represent events as occurring at a particular time, and therefore, to represent some events as occurring before others? (Kelly 2005: 211)

Roughly, the *time stamp problem* arises when asking whether the order of information presented in the perceptual experience correlates with the order of the processes elaborating the information. For example, I may have the sensory experience of "A then B", the information about "A" and about "B" can be processed either in this order, or, in alternative, the information about "B" can reach the relevant system before the information about "A", under the assumption that A happened before B. These two alternatives are the kernel behind the *"BrainTime view"* and the *"Time marker view"* (Arstila 2019), we will encounter later on in section 1.8.

The other problem discussed by Kelly is the *Simultaneity Problem:*

> The **simultaneity problem**: Which events do we perceive as simultaneous? (Kelly 2005: 213)

It seems simple to answer to the simultaneity problem, by stating that two events are perceived as simultaneous when they appear simultaneous to the subject. However, the problem comes to be that there are cases where two successive events are perceived as simultaneous whilst they are actually separated by a small amount of time interval (below 20-50 ms for visual stimuli) (Busch and VanRullen 2014) . This may lead to a chain:

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[4] See APPENDIX5 for criticism to this very line of thought. However, we assume it as a starting point.

the event A is perceived as simultaneous with B, even though they are separated by 20-50ms. But the event C, which is separated from B by the same interval, should be perceived as simultaneous with both A and B. But then the event D, which is separated from C by the same interval, should be perceived as simultaneous with A, B and C and so on. Obviously, this is not the case and an answer to the Simultaneity Problem is required.

In Kelly's view, the *Time Stamp Problem* and the *Simultaneity Problem* are different from the *Paradox of Temporal Experience* in virtue of the different questions they are concerned with. While the former two are questions about *when* a certain t-event is perceived, the latter is rather concerned with how it is possible to perceive t-events unfolding through time, *i.e.* "*This is a question about experiencing the* passage *of time, not just a question about* at what time *we experience events to occur*" (Kelly 2005: 215).

As we will see, however, these remarks by Kelly cannot be wholly accepted. *When* a certain content is realised does matter for the purposes of the of solving the paradox of temporal experience, if we assume that the phenomenology of t-event is not free-floating, but it is anchored in our brain states. Consider this: one may hold a theory according to which the sensory experience of an unfolding t-event, taking place between an instant *t1* and an instant *t3* is fully *mirrored* by the unfolding of the perceptual vehicle, taking place between *t1* and *t3* (ignoring the usual delays for information processing). Following the orthodoxy by (Dennett and Kinsbourne 1992), perceptual vehicles are brain states occurring at a certain time. If this theory is true, then it cannot happen that a content representing the event at *t2* is realised in a different instant than *t2*, otherwise there is no mirroring between the unfolding of the content and the unfolding of the vehicle. A theory of this sort, for example, *cannot admit time-markers* (see section 3.2.5). *Vice versa,* if one holds a theory where a significant amount of successive temporal parts of the t-event are given together in perception, than it matters if these are perceived as simultaneous or not (section 3.3.1).

So far, we have explained the *paradox of temporal experience*, which is the basic problem we are concerned with in this dissertation. We have introduced two other problems, *the time stamp problem* and the *simultaneity problem* and we have given a sketch of how, they can be related to the first. So, the first point to take home is that,

when a perceptual experience takes place matters to how we are able to explain our perception of t-events. In what follows we articulate more the many *principles* framing the debate among the philosophical theories of t-events perception. In the next sections we will analyse the state of the art of the debate on the paradox of temporal experience. We will show the classical formulation of the debate and we will make some clarifications about the principles in place.

1.2 The Time of the Perceptual Act and the Time of the Vehicle

Why is Kelly prone to deny that the Simultaneity Problem and the Time Stamp Problem have an impact to the Paradox of Temporal experience? I suspect that he understands the problem in a double dimension: he is concerned with the temporal location of the contents (which lasts an interval) and the amount of temporal information carried by our perceptual acts (just an instant). These are a crucial part of the issue (they are what makes the difference between the specious present theories and the deflationist models). However, they are not all, as we will see in the next section. In particular there is a reason why this debate is a *unicum* within philosophy of perception: it seems that our perceptual experiences do have the same temporal properties (order, duration, succession and simultaneity) that t-events enjoy. Every theory apt to solve Kelly's paradox, in the end, share the assumption that the temporal properties of the perceptual experiences have an explanatory role at determining the phenomenology of t-events. As will be clear in a while, this insight stands at the base of both the Time Stamp and the Simultaneity Problem.

This is why I think it is necessary to look from the beginning to the principles by Goeffrey Lee (2014a) addressing the relation between *the time at which a sensory experience occurs and the time at which the vehicle occur*. With vehicle we intend either the set of neural realisers that metaphysically necessitate a certain perceptual experience (according to physicalism), or the minimal set of neural realisers that causes the perception to occur (according to dualism) (Dennett and Kinsbourne 1992; Lee 2014b)[5].

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[5] Lee (2014a) speaks about processes rather than realisers, which makes things confused (see the APPENDIX1). However, given the discussion in Lee (2015) I think it is fair to speak more generally as realisers.

There are two ways to understand the relations between times of the sensory experience and times of the vehicle: the "vertical way" and the "horizontal way". The *vertical* one is focused on the relation between the single act of perception and its vehicle. It is the Lee's (2014a) distinction between the "*temporal correlation principle*" and the "*temporal identity principle*". According to the former, if the neural realisers of two acts of sensory experience have the same temporal location, then also the acts themselves have the same temporal location. According to the latter, the time occupied by the perceptual act is identical to the time occupied by the vehicle. The temporal correlation principle is weaker, since it could be the case that a perceptual experience is realised at the end point of the subpersonal elaboration, or that different kinds of realisers imply different times to make the same sensory experience arise. While according to the identity principle, the temporal location of the neural realisers is one and the same with the temporal location of the perceptual act[6] (Lee 2014a: 4).

In this dissertation I will adhere to physicalism, so I take perceptual experiences to be objects with spatial and temporal properties. Obviously the most straightforward candidates for spatial and temporal properties of the perceptions are those of their realisers. This constraints the way in which Lee's principles can be interpreted: either temporal properties of the acts are identical to those displayed by the whole processes giving rise to them (identity principle), or they are identical to those of the "last phase\endpoint" of such a process, which can be mostly unconscious (endpoint interpretation of the correlational principle). So, in a physicalistic perspective one of these readings of Lee's principles must be true. Therefore, the temporal location of the perceptual act has to be identified either with the temporal location of its vehicle, or with the endpoint of its subpersonal process.

The *horizontal way* concerns the time of the various single acts in relation to the various phases of the stream of consciousness. The distinction here is between the *BrainTime View* (or "Latency view", or "Time as its Own Representation view - TOR") (Arstila 2015a; 2016a; 2016b; 2018; 2019; Kiverstein and Arstila 2013) and the *Time-*

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[6] (Lee 2014b) goes more in detail by distinguishing between "total timing of the experience", the time of the whole experience, and the core timing of experience, the time of which an experience of colour realises "red" instead of "blue" (Lee 2015). There is no need for us to get into much detail.

Marker View (Dennett 1991; Dennett and Kinsbourne 1992; Johnston and Nishida 2001; Nishida and Johnston 2002; Johnston 2017). These views are views on how the contents of sensory experiences are related to their neural realisations. In a nutshell the *BrainTime view* is simple: there is a correspondence between the relations of order and duration in the perceived contents and the realisers underpinning those contents. Thus, if the content of our perception is "A then B", its neural realisers is processed in the same order: the realisers of "A" and then the realisers of "B", and it has its overall duration. Therefore, there is a *resemblance* holding between the temporal properties of the content and those of the vehicle[7].

Given these remarks on time markers and the temporal location of the vehicles it should not be a surprise that, contra Kelly (2005), the time stamp problem and the simultaneity problem matters for our purposes. A brief sketch of how the temporal properties of the vehicles are exploited by the theories of t-events perception will be illustrated in the next section about the "classical debate".

1.3 The Classical Debate and the Transparency of Experience

1.3.1 Dainton Principles

Several authors (Ian Phillips 2010; 2014c; Lee 2014b; 2014a; Chuard 2011; 2017; Prosser 2016; 2017) have tried to articulate the debate about how it is possible to account for the perception of t-events. They are all agree that a good theory of t-events perception should address some principles, they all agree on the fact that some other principles must rejected. Of course, they disagree on which principles should be accepted or rejected. Indeed, the standard way in which all of them present their position is by directly arguing against the principles accepted by the rivals. Thus, they tend to articulate differently the various positions in play, according to which principle is under discussion.

However, as far as *framing the debate is concerned,* the most influential author is Barry Dainton (2000, 2008,2018). That is why I refer to his way of discussing the issue

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[7] This has not to be confused with the Mirroring Principles, see section 1.6.2.

as "the classical debate". Contrary to the other authors, Dainton provides a quite exhaustive *list* of principles discussed by proposers of t-events perception. These are:

- o **Pheno-temporal realism**: the aim of a theory of temporal event perception is to explain the phenomenology of motion and the like, by giving a solution to Kelly's paradox. If we decide to reject *Pheno-Temporal realism*, we should come with an explanation of why it is natural to report that there is a difference in our introspection between having a phenomenology of change and, for example, inferring that change has occurred.
- o **Diachronic Unity Thesis**: contents occurring at different time can be apprehended in a single act of consciousness, as contents occurring at the same time are apprehended together. According to Dainton (2017), one plausible interpretation of this principle is the *Principle of Simultaneous Awareness* (PSA). It states that all contents that are experienced as unitary are simultaneously present to a single act of consciousness. We will see that this principle conflicts with another one, the *Principle of Presentational Concurrence* (PPC), according to which there is an isomorphism between the temporal length of an act of experience and its presented content.
- o **Continuity***:* plausibly our perceptions of t-events last for long intervals (for example when we enjoy a football game). It is usually described as a river, a stream-like flow. It is natural to wonder how the various acts of temporal perception integrate to form this stream-like flux of experience.
- o **Immediacy Thesis:** change, motion and persistence are perceived with the same vivid immediacy as colours, sounds, odours.

I suggest that the best way to frame the debate is by taking into account these principles, which I am about to discuss in a while. My warning is not be misled by the most intuitive interpretation of the positions in play which may be deduced by a superficial reading of Dainton (2000, 2008, 2017). Let see this misleading reading of the debate in the next section. It will be useful also to get acquainted with the terminology used in the dissertation.

1.3.2 The Classical Models

A superficial schematisation of the debate by Dainton (2000, 2008, 2017) can be the one according to which the various positions in play differ in the relation between the temporal property of the content and of the vehicle. So, we have:

- **Deflationist models**: both the temporal depth of the perceptual vehicle and of the content is momentary or short-living.
- **Retentional models** (Retentionalism): the temporal depth of the content spans over an interval, while the temporal depth of the vehicle of the perception is momentary or short-living.
- **Extensionalist models** (Extensionalism): both the temporal depth of the content and the temporal depth of the vehicle spans over an interval.

This is an intuitive way of framing the debate and it is also suggested by the simple diagrams that very often Dainton puts in his papers (I recommend his entry on the *Stanford Encyclopedia of Philosophy,* "Temporal Consciousness" to have a look). However, as they stand, the models seem to collapse one onto another.

As Hoerl (2017a) points out, the deflationist models can be further divided into Memory Theories (in which the perceptual content is momentary but memory helps us to be presented with a longer interval) and Resemblance Theories, according to which there is resemblance between the temporal arrangements of the vehicles and the temporal structure of the contents. Now it is easy to conclude along with Hoerl (2017a), that there seems much less difference among these models than it seems: Memory Theories seem to be just a variation of Retentionalism (or viceversa)[8]. Both the Extensionalism and the Resemblance Theory seem to get to the representation of motion, change and persistence in the same way, by exploiting an isomorphism between

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[8] As will it be clear, I do not accept this claim by Hoerl. Ideed, I think that the memory theory collapses into retentionalism (but not viceversa). This is mainly due to the objections that the memory theory faces and they regard the simultaneous presence of two acts (memory and perceptions) and the acceptance of punctuate perceptual contents (Section 2.3.1). So, the theory I defend, tenseless retentionalism, does not count as a form of memory theory because it does not involve two acts and it rejects the idea that perceptual contents are punctuate. Thanks to Vallteri Arstila to push me to clarify this point.

the temporal structure of the vehicle and those of the content. Moreover, there are versions of Extensionalism (Sprigge 1984) admitting gaps in the perception in the same way as deflationist models do. The difference seems to be what counts as a single sensory experience. Ultimately, I think that the diagnosis by Hoerl (2017a) is right: this is what happens when we are too quick at framing the debate[9]. So, now it is clear why Dainton has to be read carefully and the debate must be framed in terms of accepting or rejecting some of the principles he proposes.

1.3.3 Temporal Transparency (brief remarks)

A widely discussed principle, which is not mentioned by Dainton, is the so-called Temporal Transparency of Experience. The detailed assessment of this principle will be postponed to chapter 4. However, I would like to introduce it, in order to give the reader all tools required to understand the debate, since I will heavily rely on it. The rough and ready idea is that the temporal properties of our perceptual vehicles are not presented to us in introspection. So, I cannot be aware of the temporal structure of my perceptual vehicles from the first-person perspective.

Throughout the dissertation we will take temporal transparency as a working hypothesis. Among the various reading of the principle, the one assumed will be the "*negative phenomenological reading*" of temporal transparency by Laura Gow (2016). That is to say that we should flash out the idea behind temporal transparency as that all the temporal properties we encounter in our introspection are *attributed* to the content and not to the vehicle. In chapter 4 other readings of temporal transparency will be introduced and it will be shown why the "negative phenomenological reading" is the right choice to make sense of the debate.

1.4 Pheno-Temporal Realism: "A succession of feelings, in and of itself, is not a feeling of succession"

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[9] Hoerl (2017a) proposes an alternative: the debate is the re-edition of the debate between representationalism and naive realism. It will be addressed in more detail in chapter 4, especially APPENDIX4.

There are two much quoted passage in literature, which helps shaping the debate on the perception of t-events. The first one is the famous William James's slogan:

> "A succession of Feelings, in and of itself, is not a feeling of succession"
> (James 1980 vol I: 90)

The second one is the famous passage of the clock by Broad, who helps us to capture what William James was after:

> "It is a notorious fact that we do not merely notice that something has moved or changed, we often see something moving or changing. This happens when we look at the second hand of a watch or look at the flickering flame. These are experiences of a quite unique kind, we could no more describe what we sense in them to a man who had never had such experience than we could describe colour red to a man born blind. It is also clear that see a second-hand moving is a quite different thing from "seeing" that the hour-hand has moved" (Broad 1923)

The common interpretation of this quote by Broad (1923) is that there are at least two ways to acquire knowledge of motion by perception (and, by extension, of the other t-events). The first one is simply by perceiving things moving. This is the case of the second hand of the watch. The other one is inferring from the content of different acts of perceptions that something has moved. This happens when you watch the clock three times at 12.00, at 13.00, and at 14.00 respectively. In no case you perceive the hour hand moving, but you are able to infer that movement has occurred by comparing the position of the hand at different times. This strikes us as completely different than the second-hand case: by watching the same clock, we perceive *genuine* movement. We have a *unitary* phenomenal character of motion as an *ordered* t-event of a certain temporal *length*.

The appealing force of *Pheno-Temporal Realism* should now be clear: assuming that we undergo a genuine perceptual experience of motion is the best explanation of the difference between *perceiving* an object moving and merely *inferring its movement* from previous positions. Since the phenomenology of real motion strikes us so impressively, nobody nowadays accepts to be called "*anti-realist*" about t-events phenomenology. People coming close to its rejection usually adopt a reductive strategy,

aiming to explain the phenomenology of motion in virtue of other features than single acts of perception (Chuard 2011; 2017) or they appeal to memory (Le Poidevin 2007; Reid 1785). We will come back to this in section 2.1. However, as soon as we accept that there is a phenomenological appearance of t-events to explain, Kelly's paradox takes in place: we should now give an account of why the phenomenology is real.

The other important point is that Broad's clock case discloses what James was after with his *succession slogan*. The sequence of perceptions of the hours hand is a well-established ordered sequence, but it does not give rise to the impression of motion. The case of the hour-hand movement shows the *insufficiency* of a succession of perceptions of having a genuine perception of succession. That is to say, in order to account for *Pheno-Temporal Realism* it is not enough to appeal to a sequence of different perceptual acts. Not even if it is ordered and structured to mirror the real movement (as it is the case of the hour-hand which is seen in different positions at different hours). This makes room for two different readings of the succession slogan (Hoerl 2013; Rashbrook-Cooper 2013),a weak reading and a strong reading:

- **Weak reading**: a succession of perceptions *is not sufficient for* a perceptual experience of succession but it is still necessary for an experience of succession
- **Strong Reading**: a succession of perceptions *is neither necessary nor sufficient* for perceiving a succession.

Theories of t-events perception divide over the best reading of the succession slogan, some theories, e.g. *Extensionalism*, accept the weak reading, others, e.g. *Retentionalism*, are committed to the Strong reading.

For our purposes, it is important to underline that the Jamesian remark is the other side of the coin of Kelly's paradox. If our perception delivers us only contents representing the world at a time, even if our whole stream is made up by an ordered sequence of perceptions, mirroring the various stages of the changing environment at each time, this is not *enough* to have a genuine sensory experience of motion. At the most we have a collection of different contents at different times which are not *properly unified* to give rise to the impression of motion. The motion phenomenlogy must arise

also in virtue of the unification of the different contents at different times, provided by the theories of t-events perception. So, *Diachronic Unity* and its implications for the continuity of the stream of consciousness are the topic of the next section.

1.5 The Unity of Consciousness and Continuity

In what follows we will have a look on the last two of Dainton's principles: *Diachronic Unity* and its relations with the *continuity* of the stream of consciousness. We will see how the connection between the two is not so straightforward and the latter notion has to be treated very carefully. I will show that there are many interpretations of continuity in play and there are reasons to reject the strongest one. The upshot is that strong continuity, as it is labelled, should not count as a *desideratum* for the theories of t-events perception.

1.5.1 Unity of Consciousness: a quick overview.

In the previous sections we spent many words telling about unitary phenomenal character, giving the intuitive idea that when I undergo a certain perception, it is never possible to be presented with its content in a scattered manner. The idea of the unity of consciousness is nicely expressed by Michael Tye (2003)

> So, according to the received view, if I am using all five of my senses at a given time, I undergo five different simultaneous perceptual experiences at that time, each with its own distinctive sense-specific phenomenal character. This generates one version of the problem of the unity of conscious experience. How is it that if I am undergoing five different simultaneous perceptual experiences, it is phenomenologically as if I were undergoing one? How is it that the five experiences are phenomenologically unified? (Tye 2003: 18-19)

The notion of unity Tye is after is indeed the notion of *phenomenal unity.* It is remarkable that our consciousness always delivers a case of unified phenomenology, even though it should be the product of at least five different representations, following the different sensory modalities. Each sensory modality should come with its distinctive path of

information processing, and it is supposed to deliver different information with different formats. If Tye is right, all these differences may be appreciated in my conscious experience, but they do not result in five different contents running together all the time. The idea is that all these unimodal contents are not presented to me *as being five* numerically distinct irrelated contents. Rather they are presented as part of *one* multi-modal content. This seems to presuppose the existence of a *unifying* mechanism underling the unification of these unimodal contents. Debates take place about how the unity of consciousness is *reached* (regardless of what the correct description of content unity is). Two broad strategies can be distinguished to understand how phenomenal unity can be obtained. These can be labelled "*Experiential Parts View*" or "*atomism*[10]", and "*NonExperiential Parts View*" or "*holism*"(Brook and Raymont 2017; Raymont and Brook 2006). The dispute is on whether our unified perceptual experience is composed by elementary parts which are metaphysically prior to the whole (Lee 2015; Bayne and Chalmers 2003; Dainton 2000), or if our sensory experience is ultimately simple and every attempt to disjoint one component is nothing more than a theoretical abstraction (Tye 2003; Searle 2002). Another way to put this debate is to differentiate the two views on interpreting the unity of consciousness merely at the level of the content (NonExperiential Parts strategy), or at the level of the acts, which gives the unification of the contents in turn (Experiential Parts strategy) (Raymont and Brook 2006).

Indeed, on the NonExperiential part view, the priority of the whole sensory experience in respect to its "parts" implies that there cannot be strictly speaking vehicles to *be unified.* In This view, when we pass from a simpler act of perception, let us say the perception of A, to a more complex act of perception, let us say perception of "A and B", we simply pass from an act of the perception of A to an act of perception of "A and B". The unification relation just holds among *contents*. According to the Experiential Part view, on the other hand, we have two acts (the perception of A *and* the perception of B) which come to be unified. They still exist as proper parts of the resulting states. But the perception of A and the perception of B are still acts of sensory experience on their own and they are metaphysically prior to the whole. Of course, the point here is to provide an account on how from five unimodal acts we come with a global multimodal

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[10] Throughout my dissertation I will not use the term "atomism" anymore in order to avoid confusions with some theories of t-events like Retentionalism and the deflationist models.

act. Paraphrasing the *succession slogan: "a combination of sensory experiences is not a sensory experience of combination*" (cf. Brook and Raymont 2017)[11]. And this is the point Tye (2003) tried to get above.

I take advantage from this last observation to remind that the discussion so far has taken place at the *synchronic level.* That is to say, we are given with a characterisation of how consciousness is unified at *a single instant*. Recall the example of the laptop: when I have a momentary visual experience of the laptop in front of me, the latter is unitary, but it delivers a state of affairs taking place at *a certain instant*. By contrast, the kind of unity we are after here is *diachronic.* We are after a notion of unity of a sensory experience of t-events, given that the unfold over time, with a certain *temporal order and duration*.

1.5.2   Diachronic Unity

As we have seen in the example of the bowling ball, the smooth movement on the lane is composed by a sequence of different locations following a certain direction and a certain order. The entire movement occupies a certain temporal interval, and the same is true of its parts. We should then understand how the perception of the different parts of the t-event, of the different locations of the ball on the line let us say, are bound together to form a visual experience of motion.

The debate about the *Unity of Consciousness* is important in respect of the paradox of Temporal Experience for two reasons. Firstly, the perception of t-events is, in Kelly's terms, *unified.* Thus, it is no surprise that the same broad strategies to *reach* unity are exploited also in the *diachronic case.* Also, the debate around the perception of t-events has NonExperiential parts accounts, most notably Tye's *One Experience View* (2003), and Experiential parts accounts, most notably Dainton's Extensionalism (2000, 2008, 2018)[12][13]. One way to reach diachronic unity that promises to solve Kelly's

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[11] There is an orthogonal debate about how phenomenal unity should be characterised, in addition to how it is reached (Brook and Raymont 2017). I won't discuss it here.

[12] Please note that it would be premature at this point to assume that there is a coincidence between the Experiential Parts view and Extensionalism, and the NonExperiential Parts view and retentionalism, cinematic models. See chapter 2.

[13] Rashbrook-Cooper (2012) maintains that it is not possible to provide the same mechanism to reach the unity in both synchronic and diachronic consciousness. I stand neutral on this issue, for I am ultimately

paradox is the *Principle of Simultaneous Awareness (PSA).* According to PSA, all perceived contents are realised simultaneously[14]. This principle will be treated in length in section 1.6.

The second reason is that, paraphrasing Kelly, our visual experience of motion present qualitatively different phases and, we will see in the next section, *continuous* (we can see the same t-events unfolding for a long amount of time)*.* We have just said that, if our stream of perceptions is ultimately composed by a mere sequence of instantaneous perceptive acts, each presenting the world at a time, then the *qualitative* difference among t-events' phases gets lost in our perception. So, it seems that a unification process is necessary in order to deliver the qualitative and continuous character of the phenomenology of t-events. Assuming this can be done, it brings about interesting results.

Let us take the Experiential Part View for a moment (but, as you will see, the discourse is *a fortiori* valid for the NonExperiential Part View). Let us assume that it is possible somehow to give an Experiential Part interpretation of a perception of change, perhaps by saying that the experiential parts represent stages of this unfolding t-event. Thus, let us assume that Kelly's paradox is solved in this way. Now, If we undergo a perception of change, let us say a patch turns yellow from red, then presumably we can perceive the patch turning from yellow to blue, from blue to green etc… probably each of these changes is sensed in virtue of different experiential parts. However, nothing prevents us to attend to this chain of changes for a consistent amount of time. Think about enjoying a football game at the stadium: we are aware of changes and movements on the pitch for hours, *without noticing any substantive interruption*. This is remarkable because a few (*e.g.* Pelczar 2010a; Tye 2003) would hold that our single perceptive acts are able to provide temporal information as long as the whole game. Therefore, one may think, a kind of diachronic unification among single acts of perceptions of change has to be in place in order to give us the perceptual experience of the whole match. By

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concerned with diachronic unity and I can tolerate that the unification process for in the diachronic case is different from the one underpinning synchronic unity.

[14] In this chapter I will be neutral on whether PSA is necessary or necessary and sufficient for diachronic unity. What matters here is that PSA is *putatively* necessary. Thus, PSA endorser take it to be *a conditio sine qua non* for diachronic unity. Detractors of PSA should give an account of how we can replace PSA in turn.

applying the same operation, one may put together the perceptual experience of the game with the perceptual experience of the following dinner…and so on and so forth, until composing the whole daily stream of consciousness. Thus, the idea here is that accounting for *diachronic unity* of consciousness seems to be the *first step* toward an account of the *continuity of the stream our consciousness.*

This is very tempting, but things are not so simple. Indeed, we will see in the next two sections that, crudely speaking, the fact that the stream appears to be continuous, it is not warrant for its effective continuity. It is true that probably *if* the stream is (metaphysically) continuous, then it is partially because *its contents* are (phenomenally) unified over time. However, as we are about to see, it is dubious both that the stream really is (metaphysically) continuous and how exactly to interpret the *alleged* continuity.

1.5.3   The Continuity of the Stream

We should be careful when we speak about stream continuity. Indeed, there are a lot of often-neglected distinctions to be made. The first one is between the *continuity of the represented* and the *continuity of the stream* (Rashbrook-Cooper 2011; 2016)[15]. This distinction is at the base of the example of the football game. The continuity of the *represented* is simply the statement that our perception of t-events delivers us the phenomenology of *continuous* t-events. In this respect, it is one of the immediate *upshots of diachronic unity* for single acts of perception: the underlying unification process makes us aware of the "smooth" change in the unfolding of part of the football game and in the trajectory of the bowling ball.

Due to the intimate connection between diachronic unity and the continuity of the represented, I keep on referring to diachronic unity to cover also the continuity of represented (except when I want to make the distinction with the continuity of the stream explicit). I will indeed follow the *caveat* by Rashbrook-Cooper (2011, 2016) to use *"continuity"* to refer to a property of the *stream*.

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[15] Rashbrook-Cooper (2011) introduces also the continuity of the state, which does not serve for our purposes, since it is accepted by all parties of the debate about t-events perception.

Here things get more complicated: the influential view on the debate by Dainton (2014a, 2017) erroneously conflates the two notions. Indeed, Dainton distinguishes between a 'modest continuity', which is simply the absence of gaps in the stream from what he (2014) calls "strong continuity":

> "**Strong continuity**: A stream of consciousness is strongly continuous over an interval if each of its briefer phases is experienced as flowing into the next." (Dainton 2014: 125)

I believe that, as it stands, *strong continuity* cannot hold. The idea by Dainton (2014a) is that we literally experience *stream phases flowing one* into another. Thus, evidence about strong continuity is disclosed by introspection: the phases' flow is manifested to me in the same way in which the appearance of red is manifested in my introspective act. However, it seems to me a mischaracterisation of our t-events phenomenology, since when I see a runner moving, I seem to be aware of the various phases and connections of her run, not of my *experience of her running.* No extra ingredient is present to my introspection.

As we will see in detail in chapter 4, one of the main concerns of the theories of t-events perception is the admission of transparency[16] (Tye 1995; Moore 1903), namely the idea that our introspection never presents us with properties of any sensory experience. These connections surely count as properties of the vehicle, and therefore they cannot be themselves introspected. My adhesion to transparency is my main motivation to think that, ultimately, *strong continuity* is a bad characterisation of our phenomenology.

In his *Stanford Encyclopedia Entry* (2018)*,* Barry Dainton seems to suggest an alternative interpretation of what strong continuity consists in:

> The experienced transitions posited by advocates of Strong Continuity can plausibly be regarded as experienced changes (or successions) (Dainton 2018)

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[16] A full characterisation of Transparency will be given in chapter 4 section 2.

Sure, it is now consistent with transparency, since the perceived flowing like character of the perception is now reduced to the perception of t-events themselves. But this cannot be a valid interpretation of what these flow-like *experiential connections* are![17] Strong continuity is just the continuity of the represented, as known as, diachronic unity. This is what all theories of t-events perception are about (or provide an alternative to). So, theories accommodating strong continuity just give an answer to the paradox of temporal experience, with nothing more to add. Simply seeing changes and succession over there can be accommodated also by appealing to Dainton's *modest* continuity, namely the idea of a gapless stream. Moreover, even if there are gaps in our objective perceptual experience of an object changing, subjectively we report only about objects changing, without significant interruptions.

To sum up, either *strong continuity* is nothing more than diachronic unity (and it comes not to be an interesting notion)*,* or it is based on an inaccurate description of our phenomenology of t-events. The morals to be drawn *strong continuity* should not be regarded as a *desideratum* for any theory of t-events perception. Therefore, a theory of t-events should not be penalised if it not able to deliver it.

However, so stated, also *modest continuity* hides some ambiguities. Some help in this respect comes from Arstila and Lloyd (2014: 314). They introduce a further distinction in modest continuity:

- o **Objective continuity**: a stream is objectively continuous if given a certain interval, experience occurs at each moment within that interval
- o **Subjective continuity**: within a certain interval we do not notice gaps in the stream, even though there may be some.

The subtle distinction between *objective* and *subjective* continuity by Arstila and Lloyd (2014) is neglected by Dainton (2014a, 2018). This distinction is very important because it makes a sharp distinction between *metaphysical* claims and *phenomenological* claims about the stream. The former should be claims about

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[17] Indeed, this may be seen as a conflation between continuity of the represented and continuity of the stream (Section 1.5.3). This confusion has not gone unnoticed by Rashbrook-Cooper (2011), who proposes to take them distinct.

objective continuity, while *subjective continuity* is a claim about how the stream (rather than the t-event) *appears* to us. Moreover, while objective continuity implies the subjective, since if an experience is continuous in an interval, we are not aware of any gaps, the opposite is not true. Indeed, we may be not aware of gaps in the stream, even if there are some[18]. This is the case of the so-called *saccadic suppression,* which may be taken as giving some support to the idea of unnoticed gaps in the experiential flow.

Saccadic suppression happens following the eye movements tracking the environments. In order to build up a satisfying representation of the surroundings, our eyes jump from region to region. The reason of this behaviour is due to a difference in visual power between the centre of our gaze and the peripheral vision, which is significantly poorer. This process occurs roughly three times every second and it is fast enough that the visual system should deliver blurry images to the brain. We are not normally aware of such a blur: our brain suppresses the visual processing during the process (Holcombe 2014).

The most remarkable consequence, as Holcombe (2014) rightly stresses, is that we are significantly blind for a significant portion of our lives, but this causes no problems in our perceptual experience of time. We are simply unaware of all of it. Arstila and Lloyd (2014) further maintain that saccadic suppression happens also in duration tasks, namely psychological tasks in which participants are asked to judge the length of the *stimuli* presented. The time implied by the eyes to move is neglected in formulating the estimation[19].

Saccadic suppression seems to give support to the idea that it is possible to have subjective continuity even when objective continuity breaks down. However, this is not enough to undermine objective continuity, since it may happen that our brain is able to fill the gaps made by the saccadic movement. This may be done by inserting "previously recorded" information or anticipations filling the gaps (Holcombe 2014).

However, saccadic suppression may shed some doubts on the notion of strong continuity championed by Dainton (2000, 2014a). If the best interpretation of the

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[18] A suggestion on explaining why consciousness seems subjectively continuous is by Rashbrook-Cooper (2011), who suggests that the reason is due to our incapacity to experience the limits of the temporal depth of the contents.
[19] This may suggest a systematic underestimation of visual stimuli. On the opposite, it implies that we do not overestimate it by adding the time needed by the eyes to move.

saccadic suppression phenomenon is the presence of gaps in our stream of consciousness, then it cannot be the case that we feel the phases of our stream as flowing one into another, since these connections are often out of place. Moreover, the eventual gaps would still be unnoticed, given what we have just said about subjective consciousness. When there is the gap, there is no one there to notice it! Saying the opposite is to be committed to a sort of Cartesian Theatre (Dennett 1991, Dennett and Kinsbourne 1992), where sensory experiences are presented for the enjoyment of a certain homuncular spectator.

1.5.4 The unification of the stream

We have defined the correct way to characterise the continuity of the stream, which is either subjective continuity or objective continuity. So, stream continuity has to be interpreted either as a phenomenological or as a metaphysical claim. Until now, we have not taken a stance on whether the stream really is metaphysically continuous or gappy/discrete: the aim of this chapter is to show how to *interpret* the various principles discussed in the debate about t-events.

However, one may wonder whether, in case of a metaphysically continuous stream, it is really possible to have a unification process for the stream, by having the single acts of perception of t-events as their parts. Thus, one may wonder whether it is possible to extend the Experiential Parts Views or the NonExperiential Part Views to *reach* the unity of the stream, under the assumption that a unified stream is a *continuous* stream.

Things are not so straightforward, however. As we will see in chapter 3 there are theories of t-events that imply a NonExperiential Part view of the stream (*i.e.* Tye 2003), other theories that are tailored to provide a full Experiential Part understanding of the stream (i.e. Dainton 2000). These theories are committed to the idea that there is a parallel between *subjective continuity* and *objective continuity* (section 1.4.3). We do not perceive gaps in the stream, also because there are no gaps in the stream at all.

However, it may be the case (and I do think it is actually the case, given the discussion in section 2.1) that subjective and the objective continuity are not so straightforwardly related. Thus, in between intervals of object continuity there could be

subjectively unnoticed gaps. This means that the stream may be composed by acts that may overlap in contents, as both the Experiential and NonExperiential part views maintain, this would guarantee both the phenomenological continuity of the represented and the phenomenological continuity of the stream. These acts may be real experiences (contrary to the "NonExperiential view") and they can be themselves disunified (contrary to the Experiential view). Examples are the forms of retentionalism by Lee (2014a) and Grush (2005a, 2005b, 2007). So, once again, we should be careful to distinguish when we are speaking about the single act of perception and when we are speaking about the stream. The issue of the Experiential/NonExperiential debate shows that the two issues are not the same.

After this long digression, which was necessary to elucidate the concepts of unity and continuity in place, let us move on to one interpretation of diachronic unity: the *Principle of Simultaneous Awareness (PSA).* In doing so we will take advantage of some papers by Ian Phillips (2010, 2014a), for he frames the debate around PSA.

1.6 The Debate around the Principle of Simultaneous Awareness

According to Ian Phillips (2014a) the *thesis* to reject is the *Principle of Simultaneous Awareness* (I. Miller 1984). His way to frame the debate indeed mirrors the different attitudes that a theory of t-events perception may have toward PSA. According to Phillips (2010, 2014a) and, among the others, Rashbrook-Cooper (2013) a good theory of t-events perception, like the so-called "*Naïve-view*"[20], should reject it. We will assess the various mentioned theories in chapters 2 and 3. Here we just focus on the discussion over the Principle of Simultaneous Awareness.

The characterisations which Phillips and Rashbrook-Cooper offer are the following:

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[20] Both Phillips (2014a) and Rashbrook-Cooper (2013) call their own view "*The Naive Theory/view*". As we will see in coming back to the classical debate in section 3.2, the naive view counts as a form of Extensionalism.

> "if one experiences succession or temporal structure at all, then one experiences it at a moment—**the Principle of Simultaneous Awareness** (PSA) (Phillips 2010: 179)"

> "**PSA** If one is aware of a succession or duration, one is necessarily aware of it at some one moment" (Phillips 2014a: 140)

> "**The PSA**: There are instants at which we perceive intervals" (Rashbrook-Cooper 2013:593)

The reason why Phillips (2010, 2014a) maintains that PSA has to be rejected is that, in his opinion, it gives rise to the scepticism about the perception of t-events. Indeed, according to him, it is *the source itself of the Kelly's paradox* (cf. Phillips 2014a: 140-142)[21].

I disagree with this diagnosis by Phillips. Indeed, I go along with Dainton (2000, 2018) to understand PSA as a possible *solution* of the Kelly's Paradox, instead of being its source (please note that Dainton 2000 forcefully denies PSA, but still he considers it a possible account of how our perception experience of t-events works). In what follows, I will assess PSA and I will show that some different readings can be present in literature. I will then dismiss some of them. Finally, I will come back to why Phillips considers PSA to be problematic and why I disagree.

1.6.1 The assessment of PSA

Let us spell out the *Principle of Simultaneous Awareness* with the help of Gallagher (2003), who nicely divides it in two "Lotzean" (since it is derived from Lotze) assumptions:

> "LA1: The perception of succession requires a momentary and indivisible, and therefore durationless act of consciousness

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[21] " 'How is it possible' Kelly writes, '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?' It is, however, perplexing why such a starting point would be forced upon us simply by reflecting upon our experiences. It is much more plausible to think that Kelly's puzzle arises because we implicitly or explicitly endorse a philosophical assumption such as PSA." (Phillips 2014a: 141).

LA2: A sequence of succession is represented by persisting sensations or memory images that are simultaneous in present consciousness." (Gallagher 2003)

It seems to me that the two LAs disclose two different features of PSA. LA1 is about the duration of the *vehicle of the perceptual experience.* Taken as it stands, the only implausible part of LA1 is the great amount of emphasis on the instantaneity of the vehicle. It is implausible that the brain processes giving rise to the perception of succession (but also duration I may add), are realised instantaneously. Thus, we should interpret *momentary or instantaneous* as meaning 'short-living'. However, I will keep on speaking about "momentary" and "instantaneous" vehicle of perception, meaning "the shortest possible giving that perceptions have to arise from brain activity" (cf. Lee 2014a). LA2 looks like more content-oriented but it is not. It states that we perceive *all the sequence* (the whole t-event in our content or at least a significant part of it) in the same moment. How to make sense of this claim is our concern here.

Of course, it makes no sense to say that all the contents of the succession are presented as *simultaneous*, otherwise it would be a perception of simultaneity and not of succession. The most plausible way to go is to say that PSA states that all the various phases of the succession are represented *together* to a single act, which occurs in the *present*. This is to say, simultaneity is still a matter of the vehicle, which is instantaneous and realises whole sequence as its content. Thus, the answer to the Kelly's paradox comes to deny that we are presented with a *single instant* for every act of perception. The vehicle may be instantaneous, but the content is broader, apt to make sense of the perception of T-events. Moreover, it also provides a way to answer to the problem according to which a succession of perceptions is not a perception of succession. Let us consider this phenomenal contrast case, which comes from Phillips (2010) himself.

There are conceivable cases in which a succession of the same perceptions does not give rise to a perception of succession, for example, one may hear a succession of tones (for example A-B-C), in this sequence, and hear the sequence as a melody, thus by experiencing the sequence as a succession. On the other hand, it is conceivable that one may hear the same sounds, but just as three independent tones, with no relations of

succession among them. Since the past phases are the same in both cases, the mere past facts cannot suffice to give rise to the impression of succession (see Section 1.3). From here, we may conclude following Phillips (2010), that *some psychological facts* at the present moment should be necessary to account for the perception of succession that the second case lacks.

What *psychological facts* are about? The idea is that, roughly, since simply undergoing a succession of perceptions is not sufficient for the perception of succession, it is *the unification* of the contents at the *present times* that helps having it. Without this unification, the single tones of our example would come to be perceived as isolated from each other. They don't give us any impression of an unfolding melody. In the stronger reading, it is all a matter of having *unified contents* in a *single* act that renders the phenomenology of succession possible. Since vehicles of perception occur momentarily, then contents must be simultaneously realised to be unified. Motion is a unified phenomenon and PSA gives us a simple way to characterise diachronic unity.

Now, this idea that unity is reached in virtue of the simultaneous realisation of different contents, is at the base of the interpretation of the unity of consciousness at the *synchronic level.* Regardless of any adhesion of a NonExperiential Part View or to an Experiential Part View, the result is always a unified complex content at any given instant.

The only difference between the two kinds of unity is indeed internal to the content. In the synchronic case all contents are represented as happening at a certain time t, in the diachronic unity, they are relative to different times. Since we have seen along with Gallagher and Miller that PSA is a claim about the momentariness of the act, we should notice that this is common to perceptions unified both at the synchronic and diachronic level. Thus, just to play with words, people accepting PSA as an account for diachronic unity *have a unified account for both synchronic and diachronic unities[22]*.

That is why, I suggest to replace the formulation of PSA by Phillips (2010, 2014a) with the formulation by Dainton (2018),

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[22] To be precise, the content at the synchronic level are a subset of the content diachronically determined.

> "**The Principle of Simultaneous Awareness (PSA):** to be experienced as unified, contents must be presented simultaneously to a single momentary awareness (Dainton 2018).

Please note that this formulation is interesting for two reasons: the first one is that it does not mention perceptions of succession: Dainton interprets PSA as being purely a claim about unity, regardless of the kind of unity (synchronic or diachronic) in place. This is in line with our discussion and it will allow us to classify the all deflationist models (Section 2.1) as accepting PSA, even though their commitment to instantaneous content. Thus, the morals to be drawn is that PSA is primarily a claim about the *vehicle* of perception, and not about the content. It is the claim that a diachronic unity of the content may be reached by presenting contents about different times to a single momentary act of consciousness, i.e. by simultaneously realise different contents.

1.6.2 Various readings of PSA

According to Phillips (2010), Rashbrook-Cooper (2013) and Gallagher (2003), we may find different readings of PSA. According to Phillips (2010: 180) we may have a strong reading and a weak reading:

- **Strong PSA**: Past perceptions have *no* role in our perceptual experience of succession. Psychological facts at the present time are both necessary and sufficient for giving rise to perception of succession.
- **Weak PSA**: Past perceptions are necessary but *not sufficient* to explain the perception of succession. There must be some psychological fact at the present time that is necessary (but not alone sufficient) for the unified perception of succession.

The idea of a double reading of PSA is echoed in Gallagher (2003) who paraphrases the distinction between strong and weak PSA as a matter of accepting both LA1 and LA2 (strong PSA) or not (weak PSA). He claims that the reading by Miller (1984) of Husserl is biased by the fact that Husserl did not actually endorse the assumption LA1, about the momentary of awareness. Indeed Gallagher (2003), quoting rather surprisingly I. Miller (1984), states that according to Husserl a *continuous* awareness of

an enduring tone involves that at *any instant* of that awareness we are presented with an extended part of the tone. Thus, Gallagher concludes, the correct reading of Husserl attributes to him the idea that the awareness of the tone *is continuous and not momentary, viz.* LA1 is not endorsed by Husserl. Of course, I am not interested in giving the right interpretation of the Husserl thought, since I am not a Husserl scholar. However, it is interesting how there are affinities between the two readings of PSA by Phillips and by Gallagher. In both authors the idea of a strong PSA is linked to the fact that a sensory experience of succession is fully accounted for in *an instant,* namely in the short lifespan of a single act. Moreover, they also share the idea that the weak reading of PSA assumes past perceptions are necessary for the perception of succession.

I find this distinction between Strong and Weak PSA misleading. Indeed, PSA endorsers should consider that both Strong and Weak PSA are true. This is because they in a sense answers to two different problems. Indeed, the strong PSA answer to the Kelly's paradox: it gives us a way to understand how successions and durations are presented as unified. Weak PSA gives us a way to deal with the problem of the *subjective continuity* of the stream of consciousness, by taking into account the past perceptions in the stream. We saw in section 1.4 that the two problems, whilst *prima facie* related, are not obviously connected. Indeed, as the Husserlian case of the *enduring note* suggests, it may be the case that we are presented with t-events lasting longer than the interval presented to the single act. In this case several other acts of perception are required to perceive the whole note. And each act presents us with a distinctive interval occupied by the note (Gallagher 2003). Thus, the continuity of the auditory experience of the tone (Gallagher 2003) and the idea that past psychological facts matter to have a perception of succession (Phillips 2010) should be better interpreted as claims about how an experience of a quite long t-event is possible without interruptions (i.e. *continuity of the represented*), rather than a possible solution to Kelly's paradox. Finally note, that in the case of the enduring note, in each momentary act of awareness we are still presented with a part of succession, which is succession itself, meaning that strong PSA still holds.

Another double reading of PSA can be found in Rashbrook-Cooper (2013: 593), whose general formulation of PSA is that there are instants at which we perceive

intervals (see above). According to Rashbrook-Cooper (2013: 594) PSA may be interpreted as follows[23]:

- **Thin PSA**: PSA is made true by an instantaneous state of affairs.
- **Fat PSA**: neutral on the temporal length of the state of affairs that makes PSA true

The thin reading of PSA naturally goes along with Strong PSA, indeed according to Phillips (2010) and Rashbrook-Cooper (2013) they both share the same motivation: the possibility of "Russell Worlds". The rough and ready idea is that I may perceive the sky changing in colour from *t1* to *t4*, let us say. All the different stages of the sky changing are present to my mind. However, this may be an illusion, since the whole world has come into existence at *t3*. So, all I am experiencing happening from *t1* to *t2* has never existed. Since, my perception of the sky changing is still vivid and untouched by this fact, it follows that my act has to be bounded in the instant *t4*, in order for this to make sense. If my perception were stretched, then it would have been impossible for it to occur. Fat-PSA is according to Rashbrook-Cooper (2013: 594) compatible with a possible isomorphism between the duration of the phenomenology and what is required for it. Indeed, in a footnote he writes:

> "The motivation behind the adherence to FAT-PSA will thus involve appeal to the desirability of retaining the isomorphism between the temporal structure of the experience, and the temporal structure of the objects of the experience "(Rashbrook-Cooper 2013: 594 footnote 11)

This Fat-reading of PSA cannot be right. It can't for the simple reason that in this way we lose *simultaneity*. If there is such an isomorphism between the structure of the vehicle and the structure of the contents, one has to assume that different parts of the contents are given to different parts of the vehicle, but this means that these parts are not given *together,* but rather *in succession*. As we have seen the simultaneity of the contents is due to their being present at the same instant, i.e. the instant occupied by the act. If

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[23] Rashbrook-Cooper (2013: 593-4) speaks about truth-makers. The sentence "There are instants in which we perceive intervals" can be red both as requiring an instantaneous state of affair as a truth maker, or as allowing a more liberal views where it is neutral on the duration of the truth-maker.

parts of the act stretch over a period of time and this pattern is *ex-hypothesis* isomorphic to the one of the content, then it trivially follows that contents are not all given at the same time: they are given in succession, exactly how the parts of the stretched vehicle follow each other in succession (cf. Almäng 2014: 14)[24].

The morals to be drawn from this section is that there is just one correct interpretation of PSA, which is the idea that the perception of succession is possible because its phases are simultaneously presented to *instantaneous* acts. Thus, only the strong/instantaneous PSA is the correct interpretation: the Weak reading seems just the attempt to build the subjective continuity of the stream up from strong PSA.

1.6.3 Phillips on PSA

Now let us now focus on why Phillips think of it as problematic. And on why we shouldn't go with his interpretation. In order to make it clear why PSA is considered the source of our perplexities about temporal experience, Phillips (2014a: 140) presents two quotes, from Reid (1785) and Prichard (1950: 47) respectively.

> "If we speak strictly and philosophically ... no kind of succession can be an object either of the senses, or of consciousness; because the operations of both are confined to the present point of time, and there can be no succession in a point of time; and on that account the motion of a body, which is a successive change of place, could not be observed by the sense alone without the aid of memory." (Reid, 1785, 387)

> "Any sound has some duration, however short. If so, how can it ever be true that we really hear a sound; for to hear is to hear at a moment, and what we apprehend by way of hearing—or more generally perceiving—can only exist at the moment of hearing, and ex hypothesis at least part of the sound said to be heard is over at the moment of hearing, and strictly speaking it is all over. ... Therefore, it seems, it is impossible to hear a sound." (Prichard, 1950, 47)

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[24] Many thanks to Christoph Hoerl to point out this to me.

Then Phillips (2014a: 140) goes on by suggesting that these quotations, along with others briefer suggest that order and duration cannot be sensed in perception.

I think that Phillips is correct in claiming that ultimately the paradox by Kelly can be summarised in how it is possible to perceive order and duration, i.e. the unfolding of T-events. However, I disagree on both the fact that PSA is the source of the Kelly's paradox and that this latter claim is revealed by these two quotes. By contrast, I have argued that PSA is supposed to be the solution of the Paradox of Temporal Experience. Thus, let us see where the misinterpretation comes from.

In the quotation by Reid (1785), it is stated that no duration or succession can be confined within a point of time. Of course, the point of time Reid is concerned to is the *present moment*, which we have said it is instantaneous. Thus, as we said in length in section 1.1, the paradox arises on how we can make sense of the fact that we perceive t-events even though our content represents just the present, namely an instant. In other words, this quotation by Reid adds nothing to the formulation of the Kelly's paradox we have just discussed. No mention of PSA is implied.

The passage by Prichard is tricky, because he assumes two things: that our act of hearing is instantaneous, and that the content of our act of hearing can be heard *concurrently* with the vehicle. In stating the instantaneity of the act, Prichard tacitly assumes that there is a correspondence between the temporal depth of the *instantaneous vehicle* and the temporal depth of the content: "*what can be apprehended […] can exist only at the moment of hearing*" (Prichard 1950: 47). This brings about the undesirable upshot that the content of this auditory experience is instantaneous, and that is impossible. But this is not a problem internal to PSA as formulated above: this is a problem rising in accepting both PSA and the idea that the temporal depth of the content matches the one of the vehicle. And this is the reason why extensionalists agree in rejecting PSA (Phillips 2010, Rashbrook-Cooper 2013).

Phillips (2014a:141) explicitly recommends a change in how the debate is framed, which under his lights is centred on the acceptance/rejection of PSA. The problem of t-events perception should be better understood in terms of the relation between the parts of the vehicle and the parts of their contents, Phillips maintains. Interestingly enough, this latter is exactly the way in which one of the adversaries of

Phillips, namely Geoffrey Lee (2014a) frames the debate. This is the matter of the next section.

1.7 The Debate Around the Principle of Presentational Concurrence and the Mirror/Inheritance intuition

1.7.1 The Principle of Presentational Concurrence

We have seen that a theory accepting an instantaneous PSA is committed to the claim that, somehow, t-events are sensed all in an instant. That is to say that the various phases of the event are displayed together to consciousness, as complained by Le Poidevin. Let us assume that it is possible to have a structured overall content able to deliver the right phenomenology of motion and not Le Poidevin's blur. What strikes the most is that within the overall content t-events are perceived as having a duration which is actually much longer than the duration of the act of perception[25].

This still strikes many people like Rashbrook-Cooper (2013) and Phillips (2014b) as counterintuitive. The most natural way to give information about the temporal properties of our perceptual vehicles, such as duration and order of their phases, is to look at the temporal properties of their content. So, when I ask you to judge how long a certain stimulus lasted and then I ask how long *your act of perception* of that stimulus lasted, probably the two answers match. The idea that the duration of the content matches the one of the perceptual vehicle is called: "*Principle of Presentational Concurrence*" (PPC):

> "The time interval occupied by a content which is before the mind is
> the very same time interval which is occupied by the act of presenting
> that very content before the mind" (I. Miller 1984: 107)

Or so it appears. Indeed, the idea here is that *it seems* to us that there is a coincidence between the temporal location of the perceived content and the temporal location of the vehicle. From here it follows that very same temporal duration of the content

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[25] Please note, I am not claiming that we have access to this difference in duration between content and vehicle, but only that we perceive a duration in the content, and this duration cannot be coincident with the actual duration of the vehicle. This has to be true whether or not the duration of the act has a place within the content.

experienced is shared by the vehicle of that content itself[26]. The temporal duration of the two has to be the same. The immediate consequence of this principle is that in having the experience of "A then B", my experience of it lasts as long as "A then B" lasts. But then we may ask how long the sensory experience of just A lasts. The answer would be: "my perceptual act of A lasts as long as A". My perception of a part P of A lasts as long as that part P of A lasts, and so on and so forth. The most straightforward explanation is that our perceptual vehicles *really* last as long as their contents:

> **Metaphysical PPC**: The duration of experience in which an item X is represented is concurrent with the duration that X is represented as occupying. (Rashbrook-Cooper 2013: 588).

Metaphysical PPC is taken to be in tension with instantaneous readings of PSA (cf. I. Miller 1984: 107-9). Indeed, an adversary of PSA, like Rashbrook-Cooper (2013) starts from assuming metaphysical PPC to get rid of PSA. However, we will see, metaphysical PPC is "too much" to reject it. It is a weaker principle, *Structural Mirroring*, that is in tension with PSA. This weaker principle can be implied also by other principles different from Metaphysical PSA. These are the various *Mirror Intuitions*, explained by Geoffrey Lee (2014a), we will see them in the next paragraph.

1.7.2 PPC and the Mirror Intuition

This metaphysical reading of PPC is close but it is not the same as the Mirror Intuition and the Resemblance Intuition. These intuitions are the centre around which Geoffrey Lee (2014a) frames the debate (and that he himself rejects).

- **The Mirror intuition**: whenever there is a change in the content, then there is a change in the experience. So, if I am listening two tones (ex. A-B), when the melody changes from A to B, also my experience undergoes a change.

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[26] Here "seeming" is deliberatively vague in order to distinguish the phenomenological version of PPC from the metaphysical version of PPC. In the phenomenological PPC we do not take stance on the matter whether perceptual experience really is simultaneous with its content, like in the case of metaphysical PPC.

- **The Representation by Resemblance Intuition**: part of the reason *why* the Mirror Intuition holds, is because experience has the same temporal properties of the contents. With a slogan: "Time as its Own Representation (TOR)" (See Arstila 2015a, 2016a, 2018).

According to Lee, the resemblance intuition motivates the mirror intuition. It is easy to see why: if the parts of the experiences have the same structure of those of contents (Resemblance Intuition), then it is plausible that the content is presented to us by exploiting this very resemblance. However, as we will see in section 2.2 discussing the *Deflationist Models,* this interpretation of the *Representation by Resemblance Intuition* cannot work. As Hoerl (2013, 2017a) suggests, assuming that there is a resemblance between temporal properties of the experience and temporal properties of the content seems to commit us with the idea that we *are aware* of the fact that our perceptual experience has a certain temporal profile, i.e. its parts follow with a certain order and succession. But this seems to transfer the problem of explaining how we become aware of the temporal properties of the t-events to the problem of how we become aware of the temporal properties of our sensory experience[27]. The two intuitions motivate a third intuition in turn, which is the idea that perceptions of t-events are themselves processes composed by different parts (i.e. *Extensionalism* and the *Resemblance Theory*).

The relations between metaphysical PPC and the two intuitions depend on how strong the interpretation of the latter is. Indeed, Lee (2014a: 8) formulates three versions of the *Mirroring Intuition,* (which may be motivated by the respective *Resemblance intuitions*)

- **Metrical Mirroring**: the sensory experience's *order and duration* matches those of contents
- **Topological Mirroring**: only the vehicle's temporal order matches the one of content
- **Structural Mirroring**: distinctive stages of the content are represented by distinctive experiential stages

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[27] Please note, it would be unfair to attribute the *Representation by Resemblance* Intuition to Lee (2014a), since he explicitly rejects it!

Of course, it is obvious that the strongest Mirroring principle, viz. *Metrical Mirroring,* implies the *Topological Mirroring,* which implies the *Structural Mirroring* in turn. If there is a matching of duration *and order* between perception and content, then *Topological* Mirroring is accommodated. In the same vein, matching the temporal order between content and perceptual experience brings to the idea that different parts of the content are presented to us by different parts of the vehicle. Therefore, *Structural Mirroring is* implied by the other two, since they all are based on the idea that there is a correlation between parts of the vehicle and parts of the contents.

The first interesting point is that, given the formulation by I.Miller (1984) and Rashbrook-Cooper, metaphysical PPC is all about durations (with no mention at all of temporal orders). As it stands, it seems to be the counterpart of the *Topological Mirroring*, which is all about orders with no mention of durations. Indeed, it is implied by *Metrical Mirroring*, but not *vice versa.*

Metaphysical PPC does not imply *Topological Mirroring:* It is logically possible to have a sensory experience "A then B" matching in length the duration of the content [A then B]. Likewise, it can be the case that the perception of A has the same length of the content A and the same is true for the perception of B. However, the order of the two may be inverted without altering the corresponding durations of the various contents. This may be done by appealing to a Time Marker view (Dennett 1991, Dennett and Kinsbourne 1992), in which the order of presentation does not match those of the vehicles. *Topological Mirroring* does not imply metaphysical PPC either: you may have a perceptual experience of "A then B", and indeed the perception of A coming before the perception of B. However, these two lasts double as A and B actually last.

Metaphysical PPC implies *Structural Mirroring:* if the sensory experience matches in duration its content, then there cannot be the case of a content presented to more than one piece of sensory experience (or *vice versa*). It would mean that the content lasts longer than the single act (or *vice versa*). Of course, *Structural Mirroring* does not imply Metaphysical PPC, because it is *prima facie* possible to have distinctive contents lasting double as their distinctive perceptual experiences.

As far as the Resemblance Intuition is concerned, it is plausible to extend the line of reasoning by Lee to Metaphysical PPC and think that there is an intuition according

to which the duration of the act is part of the reasons why we come to perceive durations.

This clarification is needed to understand why Metaphysical PPC is incompatible with PSA. It is the *Structural Mirroring* constraint that makes them in tension. According to instantaneous PSA, all the contents occurring in reality at different times are presented to the same single instantaneous act of perception. Let us assume a collection of contents taking place from *t1* to *t3* and let us assume that the instantaneous vehicle occurs at *t3*. It is obvious that contents so presented are not presented by distinctive vehicles of perception. Things are different in the case of a stretch reading of PSA, where it is possible that the temporal parts of the vehicle of perception matches in structure the temporal parts of the content.

Thus, the first point to take home here is that any view that assumes or it is motivated by any of the Mirroring Intuitions or the Metaphysical PPC implies a rejection of instantaneous PSA as shown by fig.1:

Fig.1: PSA and non concurrent content

Simultaneously given contents

Non concurrent content

Non concurrent content

Act
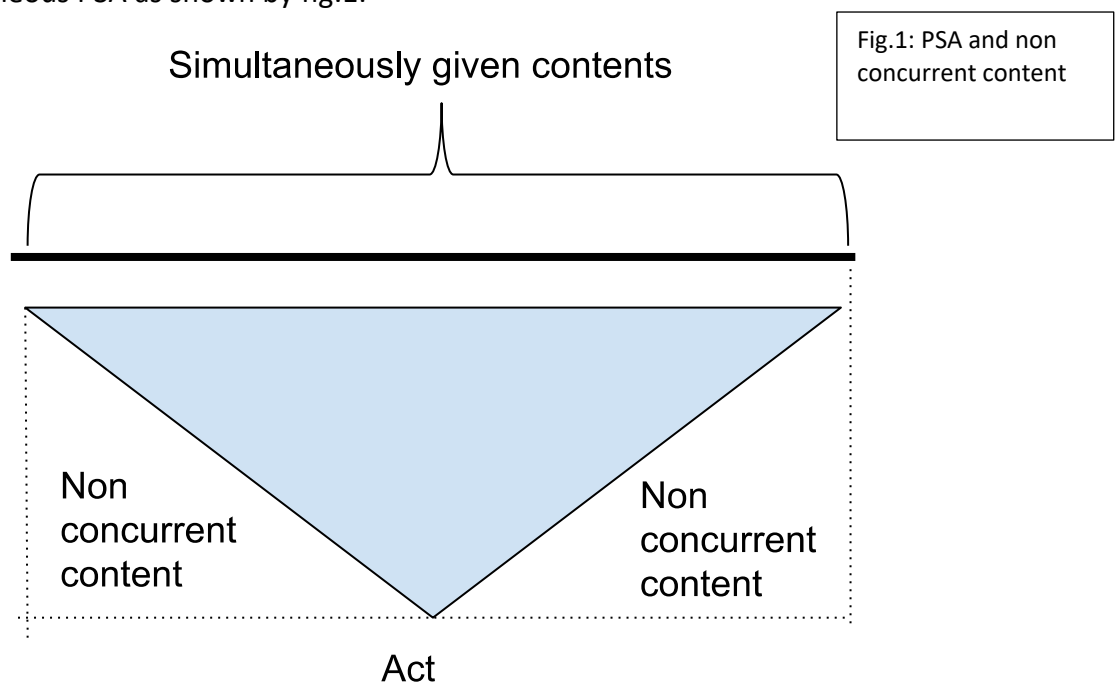
1.7.3 Stronger Readings of PPC and Mirroring Principles

There are stronger interpretations of PPC, however. Indeed, I take Matthew Soteriou (2013) to be after one of these. He writes:

"Introspectively, it doesn't seem to one as though one can mark out the *temporal location* of one's perceptual experience as distinct from the temporal location of whatever it is that one seems to be perceptually aware of. Furthermore, it seems to one as though the temporal location of one's experience *depends on, and is determined by*, the temporal location of whatever it is that one's experience is an experience of." (Soteriou 2013: 88-9, *my italics*)

Here, Soteriou is concerned with introspection. It is not a surprise, since, as we have seen PPC comes to be accepted by a phenomenological thesis first. By introspecting his own perceptual experience Soteriou comes to the conclusion which is stronger than phenomenological PPC: that there is no felt distinction between the *temporal location* of the sensory experience and that of the content. On the contrary it seems to be suggested here that *the former is dependent and determined by the latter* (although we will devote much of chapter 4 to understand whether this is the correct interpretation of what Soteriou holds).

So far, we have talked about durations in relation to Metaphysical PPC and order and structure in relation to the various Mirroring Intuitions. The suggestion from the quote has further implications: it is the *temporal location* of the perceptual act to be determined by those of the content. Among the various temporal properties, *temporal location* implies all the others: the duration of a certain event is determined by the temporal coordinates it occupies. Moreover, the temporal location of the event phases gives us their order and their succession. Thus, the consequence seems to be that almost every temporal property of the vehicle can be deduced by introspection[28]. The greatest limit of this idea is that a metaphysical interpretation of this phenomenological principle is trivially wrong. We know from empirical science that it always requires time for the information about the environment to be elaborated and become conscious (Kandel et al. 2013). Thus, the idea that *really* our vehicles shares the same temporal location with their contents cannot be accepted, especially if we take a naive realist stance (like Soteriou).

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[28] A more extensive discussion on how this can be made will be proposed in section 4.3.

The idea that the structure of the content determines the structure of the vehicle is found also in these comments by Phillips (2014a,2014b)[29]:

> "The relation between the temporal structure of the experience and the temporal structure of the objects of experience is that our experience inherits the temporal structure of the events which are its contents. The temporal structure of the world imposes itself on our stream of consciousness" (Phillips 2014a: 143)

> "I call *inheritance*, the claim that for any temporal property apparently presented in experience, our experience itself possesses that temporal property." (Phillips 2014b: 132)

The *inheritance* principle defended by Phillips is a metaphysical claim about how the experience is. *Inheritance* is a stronger principle than PPC. Indeed, *Inheritance* logically implies PPC. Three clarifications are at issue here. Firstly, Admittedly, the formulation of Inheritance by Phillips (2014a,2014b,2014c) is about the rather vague term "experience", instead that the more precise vehicle. But if by "experience" it is meant something like "content" or "phenomenal character", then the formulation comes to be empty: of course, the content and the phenomenal character have the same length of themselves! Secondly, by temporal properties Phillips he essentially means temporal order and duration, thus *inheritance* implies *Metrical Mirroring,* which implies metaphysical PPC and structural mirroring in turn. The third clarification is that *inheritance* adds an explanatory element over PPC. The reason why the vehicle of a t-event lasts as long as the event itself in because there is a one-to-one mapping between internal order and duration of the content and internal order and duration of the vehicle (Phillips 2010, 2014a). The interesting thing is that the *explicatory* element runs contrary to the *Resemblance by Intuition* by Lee (2014a). Indeed, it is not the case that a certain content is presented to me as having a certain order and duration *in virtue of* the vehicle's having those properties. The story goes in the other way: it is because the content has a certain temporal profile, that the vehicle comes to have that very same temporal profile.

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[29] See also Phillips (2014c).

1.8 The Debate around the Immediacy Thesis

According to Dainton (2000) our immediate perception of t-events is an obvious fact:

> "[...] One constraint is so basic I mention it right at the outside. Recalling the phenomenological data outlined above, it is this: our experience of change *is just as immediate as our* experience of shape and colour. [...] the constraint Is not particularly controversial: most of the accounts of the temporal experience we will be considering start from the assumption *that change is something that is experienced*." (Dainton 2000:115, my italics)

> **"The Immediacy Thesis:** change, succession and persistence can feature in our experience with the same *vivid* immediacy as colour or sound, or any other phenomenal feature." (Dainton 2018, my italics)

It is not fully clear to me what Dainton (2000, but also 2018) means by the immediacy thesis. By his lights, the Immediacy thesis is so obvious that it is not even necessary to spend many words on it. However, it seems to me that, in the end, there is conflation of several principles, all of which deserves a clarification in turn.

In his (2000) quotation, Dainton suggests that the first assumption moving the assessment of the *immediacy thesis* is the idea that *change* is something perceived. This is nothing more than the statement of *Pheno-Temporal* realism we assessed in section 1.4. If denying the immediacy thesis boiled down in the idea that denying change phenomenology is comparable to denying the phenomenology of colour and sounds, then we have already given a sketch about how this may be handled by the "anti-realist" about t-events perception.

Thus, it seems more than that. It could be a matter of "vividness", in the sense that from a phenomenological point of view, the impression given by change is as strong as the impression given by colours and sounds in perception. Admittedly, this notion of vividness is rather vague. Probably the point is that there is a phenomenological difference in having full blown perception of an object, *e.g.* an apple, and an episode of memory about that apple. Perceptual contents are thus *vivid* in a way that contents of

other faculties are not. Within perception there is nothing which is less vivid such to be closer to the content of episodic memory. This notion of "vividness" seems to me just another name for *pheno-temporal realism,* for in the end it seems that it is just the statement that t-events are *perceived*, *i.e.* they have the vividness peculiar of perception in respect to other faculties.

Dainton (2018) seems to link the notion of vividness to the notion of *modes of presentation* in perception. Indeed, he ascribes the acceptance of the immediacy thesis to those theories of t-events which *do not involve* modes of presentation and the rejection of the thesis to those theories involving temporal modes of presentation. As we will see in section 3.3.2, these theories assume the *Principle of Simultaneous Awareness* (see section 1.4) and the idea that there is a structure internal of the content of each act of perception, given by these temporal modes of presentation. The intuitive idea is that a certain phase of t-events is perceived "*as-present*", while the other are perceived "*as-past*". Indeed, there is an established tradition according to which the temporal modes of presentations are understood as tensed (and the two notions can be seen as equivalent in the case of time) (cf. Almäng 2014, Kiverstein 2010). The thought by Dainton seems to be that employing these notions of modes of presentation makes content perceived in a different way than "*as-present*", lose the phenomenal immediacy proper of contents perceived as present[30].

I am not convinced that this is a fair to put the immediacy thesis this way. Firstly, it is not obvious why certain temporal modes of presentation should deliver less immediate contents. Indeed, following the suggestion by Dainton, some of them (the present tensed ones) still deliver immediate contents. Thus, the immediacy issue is not linked to tenses *per se,* but only to *certain* modes. Non arbitrary reasons to make the

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[30] Here is the exact quotation:

"*The contents of the Extensional specious presents – the contents apprehended as changing – are ordinary experiential contents (e.g. sounds as they feature in the immediate experience). Consequently it is not surprising to find proponents of the Extensionalist model generally subscribe to the Immediacy Thesis. Their Retentionalist counterparts can do so, but usually don't – a notable exception is Lee (2014a, 2014b). Brentano, Husserl and other leading Retentional theorists hold that the contents of the specious present apper under varying "temporal modes of presentation" (as the are often called). If the succession of tones [C-D-E] form a single specious present, if E seem fully or maximally present, D will appear under the mode "just past", and E "a little more past". On this view Each of C, D, and E are experienced as parts of a unified ensemble – in conformity with the Dyacronic Unity Thesis – but they are not experienced as having the same phenomenal immediacy"* (Dainton 2018)*.

demarcation between the two are required. Secondly, I suspect that these reasons are linked to the fact that it is the *phenomenological datum* that suggests so. This is to say that in perceiving a t-event, one phase stands out over the others, and this phase is the one presented as *temporally present.* Thus, if the difference in immediacy between the various modes of presentation is motivated by the attempt to capture this phenomenological datum, it seems to me that accepting the immediacy thesis for all contents comes to be a damage instead that a virtue of a theory.

Finally, and this is the most important point, the immediacy thesis is about *change, succession, and persistence* as a whole, not about the single phases of these events. A theory involving tenses does not attribute these modifications to the event as a whole, no more than I attribute to myself the property of being opposable of my thumb. This it does not follow from the fact that some contents representing the phases of a certain event are less immediate than others, than all phenomenology of change is less immediate than that of colours, for example. It may be the case that the *immediate* perception of change just is having an immediate perception of a certain phase and less immediate contents representing the previous phases (although I do not think so, because of the first reason).

Actually, another interpretation of what the immediacy thesis consists in comes from Chuard (2011). In interpreting Dainton (2000) he writes:

> "One alternative is to treat the direct/indirect distinction as a matter of what is purely perceptual or sensory in perception on the one hand, as opposed to what is more properly characterised as "cognitive" on the other. In this (contrastive and vague) sense, perception is direct if devoid of any meddling from any other type of conscious psychological state or inference; and indirect if it depends on such meddling." (Chuard 2011:4).

We do not need memory, inferences or other mechanisms to perceive colour or sounds. The sensible qualities of the objects are fully presented to us through perceptual experience. This characterisation of the immediacy thesis has the merit to be closer to the "vividness" interpretation, since both assume that there is a distinction between

acts of perceptions and acts of the other faculties, but it does not boil down into a re-statement of a *Pheno-Temporal Realism.* It does not reduce to *pheno-temporal* realism because it states that, t-events are not only perceived, but that the perceptual acts involving them are not carried on with the help of other faculties like memory or inferential mechanisms. Thus, if Chuard is right, the immediacy thesis implies *Pheno-Temporal realism,* but it is a stronger principle stating that nothing else, but perception is involved in our sensory experience of t-events. Thus, it is a principle rejected by Memory Theories.

It has to be noted however that this interpretation is a betrayal of what Dainton (2018) has in mind[31], since temporal modes of presentation would not count as a violation of immediacy, under this view. It is true that, arguably, different *perceptual experiences* present us with their contents with different modes of presentation, but different modes of presentation may be relative to the same faculty, as in the case of the temporal modes of presentation above. Indeed, these are ways internal to perception to present contents, and no other faculties are in play.

Finally, it should be clear that, in the end, saying that immediacy holds in this perspective seems just to admit the specious present (section 3.1) in order to accommodate the relational principle (section 1.1). This is not a surprise, as it will be clear in the next chapter, the idea that perception alone is responsible for the phenomenology of t-events without the auxilium of other mechanisms is possible just with the admission of a specious present.

APPENDIX1: Kon and K. Miller's (2015) Classification

Putting attention to the time of the neural realisers (or vehicle), Kon and K. Miller (2015) suggest a model of classifying the theories of t-events perception along three axes.

- **Level A**: the level of the conscious experience. Here we should consider whether conscious experiences have proper parts

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[31] Dainton (2000) is convinced that there is a irriducible "dynamic" character in all our experiences, that is why he takes "immediacy" to be connected to vividness. However, this doctrine has been questioned by Dainton (2014a) himself. More on this in section 3.2.3.

- **Level B**: The level of the base *(the vehicles in our terms)*
- **Level C**: the external time

Kon and K. Miller's (2015) classification assumes that the external time (Level C) corresponds to the temporal length of the realiser and that it is reasonable for Level B to share the same mereological structure of Level A. Thus, if the perceptual experience is like a process with distinctive temporal parts, also its realiser should unfold following temporal parts. I suppose that Kon and K. Miller tacitly assume the "temporal identity principle" (section 1.2) in order to make their classification. The idea that the realiser is a process with temporal phases mirroring the temporal phases of the conscious experience may find its motivation in the idea that there is identity between the timing of the two. The experiential parts (which are conscious experiences themselves) should be identical with parts of the neural vehicle. Thus, they make a distinction between ExperientialParts-Stretched vehicle, NonExperientialParts-Stretched vehicle, ExperientialParts-instantaneous vehicle and NonExperientialParts-instantaneous vehicle. They are divided on whether conscious experiences have other experiences as proper parts at Levels A and B (Experiential Parts vs NonExperiential Parts distinction) or on the temporal length of the neural realiser at Levels B and C (Stretched vs Instantaneous realiser)[32].

According to Kon and K. Miller, Lee's theory (2014a) comes to be a form of NenExperientialPart-stretched vehicle theory, while general retentionalism would be the opposite: a form of ExperientialPart-instantaneous vehicle theory. This is not true and Lee should be counted among retentionalists (cf. Lee 2014b). The reason why Miller and Kon got mislead is that Lee (2014a) explicitly admits neural realiser of the conscious experience is a made up by neural processes. *Qua* processes, the temporal vehicles should span over an interval. Moreover Lee (2014a) does not admit that the perception of a change is composed by the perception of the phases of the change, qualifying his theory as a NonExperientialParts strategy. On the contrary, according to Kon and K.

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[32] I changed the terminology by Kon and K. Miller (2015) in order to better adhere to the terminology I use in this dissertation. Indeed, they make a divide between Atomic vs Non-Atomic (i.e. by speaking about the NexParts vs ExpParts distinction) experience and Extensional vs Non-Extensional experience (meaning by that the length of the realiser and not of the whole experience).

Miller, General Retentionalism assumes an instantaneous act of perception and the idea that the perceptual experience is structured in *virtue* of the structure of its content. And, finally, the interpretation Kon and K. Miller offer gives the following characterisation of Retentionalism: the act of the perception retains the previous *phase* of the perception (so it is a ExperientialPart Strategy).

What is interesting in the classification by Miller and Kon, is that the time of the perceived t-event, i.e. *the time of the content, does not figure*. This is strange since according to some extensionalists like Phillips and Rashbrook-Cooper it is the time of the content that determines the length of the *perceptual act* and thus of the vehicle. Thus, this is a missing point in their classification and a missing point that is highly damaging. In the end, it should be rejected. In what follows I will argue that it is this flaw that makes, rather absurdly, Lee's position to be radically different than General Retentionalism. Indeed, there are several reasons to go my way.

The first reason is that no retentional theorist (and actually no deflationist theorist either) accepts that the act of perception is strictly speaking instantaneous. It is obvious that neural processing (both conscious and unconscious) are required for any act of perception nowadays. It is biologically implausible. The point is that the act is short-living, but of course it has to lasts for an interval. This is true even if we want to characterise the act of perception as a mental state (as opposed to a process) occurring after unconscious elaboration (Cf. Soteriou 2013). Also, the mental state has to occur over an interval, even if it is brief. What is common between the Lee's position and general Retentionalism is the idea that the act, i.e. the length of the neural base, is the shortest possible to give rise to the perception of change. And the short living act of perception may be well shorter than the temporal length of the content (violation of PPC).

The second reason is that the characterisation of Lee's position seems to be dramatically close to the characterisation of the full-blown extensionalist position by Sprigge (1984). According to Sprigge our perceptual comes in discrete pulses, with no overlap among them. Due to its extensionalist slant, Sprigge cannot admit that parts of the sensory experience may count as proper conscious experiences on their own, if not within the pulse. Thus, we may launch an objection similar to the one by Hoerl (2017a) to the classical debate: we may wonder whether the pulses are not ultimately atomic

conscious experiences with a temporal extended base, thus the position Miller and Kon attributes to Lee. Therefore, we may make Lee's theory to collapse over extensionalism, and that is absurd.

The third reason is that both the characterisations of Lee's position and of General Retentionalism are misguided. Retentionalism is not necessarily about retaining previous phases of the perceptual acts (although some like Kiverstein 2010, and under certain respects, myself can state so) it is about being presented with *contents* whose temporal location is in the past. Finally, in characterising the position by Lee, Miller and Kon assume that it is necessary committed to the temporal identity principle, in order to make the vehicle lasts an interval along with the base. However, Lee himself (2014a) is neutral between the temporal correlational and the temporal identity principle, but I bet that the fairest way to characterise his position is to say that the time of the act is identical to the last phase of the neural process realising it (and this would grant the correlation between the time of the process realisers and the time of the perception).

Such confusions arise exactly because the relation between the time of the vehicle and the content of the senory experience of t-events is not taken into account within the classification by Kon and K. Miller. If the temporal dimension of the content in relation to the vehicle were taken in the right consideration, there would not be conflations between the theory by Sprigge (which obeys to PPC) and the theory by Lee (which rejects PPC as long as Metrical Mirroring). Moreover, there would not be a too harsh distinction between the position by Lee and General Retentionalism, for they are both motivated on the bases that the temporal properties of the content have no obvious match with the temporal properties of the vehicle. In a sense, Dainton's classification strikes back.

To sum up, the classification by Kon and K. Miller, which is based only on this parameter and the mereological structure of the conscious experience, brings about implausible conflations and decouplings among the various theories of t-events perception. This is due to their not taking into account the time of the content of the perceptual experience in relation to the time of the vehicle. Thus, I recommend framing the debate in relation to how the various theories of t-perception respond to the principles we have discussed in this chapter, especially PSA and the various Mirroring Principles, including PPC.

Chapter 2: The Deflationist Models.

In the previous chapter we have focused on the paradox by Sean Kelly (2005) and how it gives rise to the various theories of T-events perception. Just to recall, it is motivated by the idea that our perceptual experience provides us with temporal information of just an instant, i.e. *the present moment,* but the perception of change, movement and persistence (t-events) requires temporal information beyond an instant. Change, movement and persistence require time to unfold. Thus, it seems that our perception can at the best give us series of instantaneous contents representing the world as it is at an instant. But contents of this kind are completely inadequate to capture the distinctive phenomenology of these conscious experiences. No instantaneous image can give us the character of genuine motion, this is mainly due to the lack of *unification* among these contents. Thus, it seems that Kelly's paradox is generated by these two conflicting claims:

1) Perceptions whose content has no temporal depth (viz. representing the world as it is at an instant) cannot adequately capture the phenomenology of t-events, namely *what-it-is-like* to perceive a t-event.

2) Our perceptual systems deliver us perceptual experiences with only instantaneous contents.

We can now discuss the various theories of t-Events Perception. It is easy to see that the two available moves are either to reject claim 1 or to reject claim 2.

Dropping claim 1) means to deny that Kelly's concern *is a problem:* by rejecting claim 1), these theories are committed to say that there is nothing problematic in the fact that our conscious experience of motion boils down to this sequence of snapshots. It will come as no surprise that the *cinematic models* (as known as *snapshot theories*) falls into this category. Due to their deflationist character in respect to Kelly's concern, I will refer to these theories as *Deflationist Theories.*

The other broad strategy is to drop claim 2), namely the idea that the temporal content of our sensory experience is bounded into one single instant. The two major

families of theories of t-events perception, namely *Retentionalism* and *Extensionalism,* find their place here. These two theories share the idea of the *Specious Present*: namely the thesis that our acts are presented with a *temporally extended content.* As it should be clear from our discussion in section 1.8, admitting the specious present is, in the end, one and the same with accepting the *immediacy thesis*: our perception is alone sufficient to deliver the phenomenology of t-events.

Interestingly enough, this distinction matches the rough and ready one made by Prosser (2016, 2017), based on the acceptance/rejection of the specious present. However, it goes more into detail on the issue of how the theories of t-events respond to Kelly's Paradox and how this is connected to the classical distinction by Dainton (2000, 2008, 2018)   Let us have a look at the deflationist models.

2.1 The deflationist models

In this section we will assess the deflationist theories of perception of t-events, namely those rejecting the idea that the conscious experiences delivered by our perceptual systems are inadequate to account for the phenomenology of motion, change and persistence (Claim 1). The families of theories in this section share many points in common and diverge in many others.

Let us start with the common points. Firstly, and foremost, the idea of punctuated perceptual experiences is motivated by the choice to appeal to both the *Principle of Simultaneous Awareness* (PSA) and the *Principle of Presentational Concurrence* (PPC). According to PSA, the unification of the contents in the sensory experience is possible *in virtue of* their being simultaneously realised by a *momentary* vehicle. According to PPC, the temporal depth of the content has to be isomorphic to the temporal depth of the vehicle. The result is that we have momentary acts presenting punctuated contents with no significant temporal depth, *i.e.* with no sufficient temporal information to account for the conscious experience of motion, change and persistence. This is because the *structural mirroring* implied by PPC imposes that every bit of temporal content is realised by a bit of the perceptual vehicle, and PSA constrains the temporal length of the vehicles themselves: they have to be momentary. Thus, our perception system works like a camera, sampling information from the environment

with a discrete *pace.* The analogy is the reason why Dainton (2000, 2008, 2018) refers to them as *cinematic models.* However, in order to have a better grip on the common features of these theories (since the only theory exploiting the analogy with cinema's camera until the end is Chuard's 2011, 2017). I refer to them as *deflationist models* or alternatively as *snapshot theories.*

The admission of these discrete, short-living representations, which is the peculiarity of the deflationist models, brings about the obvious problem of how we should make sense of the phenomenal contrast suggested by Broad. Recall that the idea behind Broad's clock is that we can perceive genuine motion by looking at the second-hand clock, while the motion of the hour-hand can only be inferred. The differences in answering to this question reflect the differences in the various theories. More to the point, if according to these theories, our stream of consciousness is composed just from the succession of the snapshots of this sorts, *deflationists* are required to give an explanation of why it seems to us that we undergo perceptions of succession just from successions of perceptions (i.e. they have to accommodate the Jamesian slogan).

As I anticipated in section 1.3 these obvious challenges have given *deflationists* the somewhat misleading name of *anti-realist* about t-events perception. A label rebutted by all of them (Chuard 2011; Arstila 2016a; 2018; Prosser 2017). Indeed, nobody nowadays denies that there is a real *phenomenology* of motion, comparable in vividness with our conscious experience of colour and sounds (section 1.8)[33]. That is to say, they accept *Pheno-Temporal Realism,* but they do not accept the *immediacy thesis* (recall that the *immediacy thesis* implies *Pheno-Temporal Realism*, but not *vice versa).* Thus, all the deflationist theories postulate different mechanisms in order to explain our conscious experience of motion, change and persistence along with the perceptive acts.

More perspicuously, the general idea behind the snapshot conception is to reject that our perceptions alone accommodate the relational principle. Since our perceptual

[33] Even though some quotes from Chuard, may rise confusion. For example:
" *To be clear, the snapshot conception ins't trying to explain how we do, in fact, have temporal experiences. We don't, the snapshot theorist surmises. Rather, the view aims to explain what it's like to go through succession of very short conscious experiential states, to the point out how the phenomenology thus accounted for seems indiscriminable from the sort of phenomenology associated with the temporal experiences we allegedly enjoy.* Thus, the snapshot view doesn't reject the phenomenological appearances, quite the contrary. It aims to explain them without liberally assuming that such appearances must be taken entirely at face value*, as revealing the metaphysical structure of our stream of consciousness*". (Chuard 2017: 126, my emphasis)

system delivers us with snapshot of the world as it is at a certain instant, we are at the best presented with a single *relatum* each time. Thus, the *relational principle (or constraint)* cannot be met by our perceptual acts*:*

> **The relational constraint**: For any relation R, a subject S can perceive R between x and y only if S perceives both its relata x and y. (Chuard 2011: 3)

Thus, something more has to be added along with the acts of perception in order to give rise to the perception of t-events. This is why the label of *anti-realism* has to be considered carefully: *strictu sensu* it can be applied if we consider that perception is insufficient to capture the phenomenology of t-events. *Latu sensu,* the phenomenology of motion, change and persistence is real, but it requires the help of something else to be captured. That is why we will be referring as "perception" for the *strictu sensu* notion, "experience" for the *latu sensu*. Please notice that in any case perception plays a role at perceiving t-events.

Finally, since all share the assumption that our perceptual contents have no temporal depth, they are all obviously incompatible with the idea of the *specious present*, which is, by definition, the claim that our contents span over intervals. Thus, arguing for the specious present is arguing against the deflationist models and vice versa (cf. Prosser 2016, 2017).

With these observation in mind we can start to assess the various *deflationist proposals.* As we anticipated in section 1.3, they can be sub-divided broadly speaking into two kinds of approaches: firstly the *Resemblance Theories* (Chuard 2011; 2017; Crick and Koch 2003; Watzl 2013)(Section 2.2), according to which the mechanism delivering the representing is the resemblance between some temporal arrangements among the various tokens vehicles of perception and the temporal properties of the content. The Beam View described by Dainton (2008, 2018) belongs to these. The most sophisticated version of the Resemblance Theory is the *Dynamic Snapshot View* (Arstila 2016a; 2018; Presser 2016; 2017) (section 2.2.2). The other deflationist approach is the one by the *Memory Theories* (Sections 2.3.2, 2.3.3)*,* where the conscious experience of motion is achieved in virtue of the aid of memory (Le Poidevin 2007, Augustine of Hippo 398, Reid 1785).

2.2 The Resemblance Theory

2.2.1 The "pure" Resemblance Theory

The idea of behind the pure Resemblance Theory (from here on just "Resemblance Theory") is that the cinema metaphor is to be taken literally. When we are in front of the screen we are presented with a fast sequence of momentary images. Each photogram captures just an instant of the scene. However, due the *run pace* at which these images succeed one another on the screen, they give us the impression as of real motion, change and persistence. In this section I will enter into details about the resemblance theory, by exploring the virtues and the reasons why one may be sympathetic with these accounts. Many of these virtues comes from empirical data, so there will be a lot of empirical discussion. However, I will finally conclude that, in the end, the difficulties (also empirical in nature) overcome the intuitive advantages.

The most prominent endorser of this conception is Chuard (2011, 2017), who develops it in detail. It is based on the three following claims:

1) **Snapshot Metaphysics**: our stream of consciousness is composed only by short-living perceptual experiences.
2) **Snapshot Content**: there is no perceived temporal relation, apart from simultaneous events in the content of these "ephemeral" perceptual experiences.
3) The **phenomenology of temporal relations** (duration, order, succession, simultaneity) is *reduced to* the temporal arrangement of the short-living perceptions (their sequential order and succession) and their "instantaneous" phenomenology.

The idea should be clear enough. All that our phenomenology of t-events amount to is the succession of these short perceptions, presenting us with a temporal part of the perceived t-event. Let us spell it out in more detail.

The claim that Resemblance Theorists are against the idea that a succession of conscious experiences is not a conscious experience of succession is an oversimplification. Indeed, there are a couple of missing ingredients that the resemblance theorist provides to account for that.

The first one is the temporal profile of the snapshot experiences. For example, I may experience yellow (at *t1*) turning to orange (at *t2*), turning to red (at *t3*). According to this theory, I undergo the perception of yellow e: [Yellow] slightly after *t1*, a perception of orange *e:[*orange] slightly after *t2*, and the perception of red *e*:[re*d]* slightly after *t3*. This because yellow causes me to perceive yellow, orange causes me to perceive orange and red causes me to perceive red.

Metrical Mirroring, and thus PPC, Topological and Structural Mirroring, (section 1.7.2) are in place here. What is interesting is that they are not in place at the level of the single perceptual act, because of course snapshot's content cannot be equal in length to the whole perceived t-event. However, they are in place between the *stream* and the unfolding t-event.

In the example above, the felt duration of the mentioned change from yellow to red (*t1-t3*) *is reduced to* the overall duration of the sequence of the perceptions (*e*:[Yellow]*, e*:[Orange]*, e*:[Red]). Therefore, PPC is accommodated. The order of the perceptions follows the one of the contents (Topological Mirroring), and there is an overall structural resemblance between the phases of the stream and the phases of the content (Structural Mirroring).

The second element is the pace run of the acts of perceptions and comes in slightly different fashions according to our conception of the stream. Regardless of whether we conceive the stream of consciousness as continuous or discontinuous (see below), the impression of motion, change and persistence arise from the *fast pace* at which these perceptions run in our head. Here the metaphor of cinema comes at its best, since the very same idea is exploited here. This suggestion comes to be even more appealing if we take the suggestion by Crick and Koch (2003), according to which we are constantly presented with images *suggesting* motion, even though they do not represent motion, such as fig.2[34]:

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[34] There is debate in aesthetics on whether such images indeed represent motion (Le Poidevin 2017; Young and Calabi 2018). However, if it turns out that these images really capture motion, this can be seen

Fig.2. Skater's rotating motion is just suggested by this picture

Films are full of images like this and their fast run is what gives rise to both the impression that there is something genuinely moving, and the lack of awareness of the gaps between two successive photograms.

An interesting issue is the perception of discontinuous change. According to Chuard, the lack of unity among the various phases of the stream makes the snapshot conception able to explain two kinds of changes: smooth changes and discontinuous changes. Indeed, he writes:

> "Consider a succession of experiential states which might seem highly discontinuous: first you experience the layout of my office (*e1*), immediately followed by the sight of the crowd in a stadium (*e2*), after which a uniform yellow surface is instantly presented (*e3*), and then a kitten asleep on a sofa (*e4*), are experienced within two or three seconds. For the snapshot view such a succession should appear discontinuous, precisely because the snapshots' respective contents, with little representational overlap, fail to constitute a gradual and coherent progression." (Chuard 2017: 128).

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as a good consequence for the deflationist resemblance theorist. They argument for a genuine phenomenology of motion gains strength by the admission of this kind of motion in their snapshot experiences.

Thus, Chuard seems to suggest, there are conceivable cases of *abrupt* changes, along with the smooth kind of changes we have analysed so far. The idea is that the phenomenal qualities captured by our snapshot perceptions play a role at accounting for the phenomenology of our changes. Indeed, the lack of "similarity" among the various snapshots brings about the phenomenology of *discontinuous* change, instead of the smooth one. With *"similarity",* I mean here a qualitative aspect able to make a difference between what is a coherent progression and what it is not, following the suggestion of Chuard. The analogy with the cinema takes place again: if the images within a certain sequence are sufficiently qualitatively close, they give rise to the impression of smooth motion and change. *Vice versa,* sudden "*match cuts*", just to use the cinema jargon, bring about the perceptions of a disunified succession. A remarkable example of this can be found exactly in the cinema: it is the famous scene in Stanley Kubrick's "*2001 Space Odyssey*" which portraits a bone turning into a spaceship (https://www.youtube.com/watch?v=ApCPkJopI9I&frags=pl%2Cwn).

This idea about abrupt change is interesting also for another reason: it reverses the explanation order between diachronic unity and perceptions of change. It is because there is no unification between adjacent perceptual acts that *similarity* (or the lack of it) among close contents bring about the possibility to appreciate different types of changes. Thus, the concerns by Prosser (2016, 2017) about disrupt changes as supporting the specious present are misguided. Both the Resemblance Theory and Prosser's Dynamic Snapshot Theory (sharing with the Resemblance Theory the same basic framework see section 2.2.2) have the resources to account for abrupt changes[35].

The simple way in which the Resemblance Theory attempts to explain our phenomenology of t-events seems very attractive. Indeed, it has some theoretical virtues. Let us start with Dainton's principles. The Resemblance Theory has an answer to why the succession of perceptions is not a perception of succession: the temporal arrangement of the snapshot perceptions and the running pace are equally necessary.

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[35] Actually, *pace* Chuard (2011) also the specious present theories can explain abrupt changes in this way: dramatically different contents fall within the same specious present.

Thus, it can *reductively* accommodate *Pheno-Temporal Realism,* since phenomenal appearances of t-events can be explained in an elegant way in virtue of the temporal profile of the stream. Moreover, it can both accommodate the idea of a continuous stream of consciousness (*Beam View*) and of a discontinuous stream (Chuard's Resemblance Theory), which still appears *moderately continuous.* In case of a gappy stream, gaps are too short to be noticed at the fast run pace of the snapshots. Thus, *subjective continuity* is accommodated. Moreover, due to its instantaneous contents, it has no need to address for the problem of diachronic unity. Nevertheless, it is able to accommodate both the *mirroring constraints* (this latter at the stream level) and *PSA.*

Finally, the greatest theoretical virtue is that it explains the phenomenology of t-events in an economical way in respect to the competitors (Chuard 2017). Indeed it is not forced to account of how different contents at different times are bound together like in the extensionalist specious present and why the whole conscious experience of change has something more than the contents from which it is composed (section 3.2), it poses no other faculties like memory nor dubious motion *qualia* (sections 2.2, 2.3), no mechanism to avoid the *stuttering problem* (section 3.3.2) like Retentionalism. On the other hand, it is on a par with the other theories in assuming that the stream of consciousness is composed by various parts, which are connected in different ways to the parts of the unfolding t-events and that this has a role at explaining long changes.

However, the most attractive point of the Resemblance Theory is the great amount of data *empirical data* that seems to point to the direction of short-living snapshots. The first families of illusions are indeed those of *apparent motion, beta* motion and *phi* phenomenon[36]. They are similar phenomena, since both involve the presentation of instantenous, not moving, nearby stimuli within a certain spatial area, but they are different in some respects. When two or more stimuli are presented flickering in alternation with a quite high frequency, *phi* motion appears: the two stimuli are are reported not to move. On the contrary, they are reported as being simultaneous. It appears that an "indeterminate object" of the colour of the background goes back and forth in between and occluding the stimuli, generating the impression of something

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[36] Examples of both can be found here http://mesosyn.com/mental8-14.html

rapidly moving. Given the indeterminacy of the object in question, sometimes, this finding's is interpreted as involving the perception of an objectless motion (Steinman, Pizlo and Pizlo 2000). Moreover, *phi* motion can appear even if there is no interstimuli interval, namely if the flickering frequency of the stimuli allows them to be both on the screen for a while (Ekroll, Faoul and Golz 2008).

Beta motion instead involves nearby stimuli presented in sequence with a significant interstimuli interval (the optimal length is 60ms). We report to perceive the first stimulus as *moving* from its position to the following one, as in a genuine ordered succession in which motion is attributed to a definite object (Steinman, Pizlo and Pizlo 2000). At the bare minimum, apparent motion is the warrant that our phenomenology of motion can arise from purely instantanous images.

Resemblance theorists now also have the ground to make their analogy with Cinema stronger. What our conscious experience really presents to us in case of *phi* and *beta* motion, they might say, is a sequence of snapshots of this sort: the "picture" of the first stimulus, the "picture" of the blank, and the "picture" of the second stimulus. The fact that also the blank is represented is not a problem for the resemblance theorists, which can exploit the analogy with cinema once again: the change has to be taken into account over a sufficient amount of pictures. Indeed, if a coherent sequence of a scene is interrupted by a single incoherent frame, the latter is barely noticed. The same happens in case of *phi* and *beta* motion.

Other empirical findings seem to support the analogy between our perceptual system and the camera, in the sense of providing support to the idea that the stream of consciousness is not continuous. Thus, they favour the most popular version of the resemblance theory, namely Chuard's, over the *Beam View*[37]. Firstly, there is the already mentioned *saccadic suppression* (section 1.4.3), according to which our eyes rapidly move to get new information from the environment. This fits nicely with a discontinuous conception of the stream, which is very well accommodated by the Resemblance Theory. Secondly, evidence from neuroscience (EEG studies) demonstrates that there is a certain regularity in the oscillation of the membrane

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[37] I Will not try to assess the Beam View in respect to these data. Since I will ultimately reject all versions of the Resemblance Theory for the reasons I am about to explain at the end of this section, I am not moved by the fact that one of the versions is damaged by these empirical data.

potential of the neurones of the cortex, which is around 10-13Hz (one every ~100ms). It is the so-called Alpha Rhythm. The oscillation of these neurones have been proven to affect our attention (Busch and VanRullen 2014), which is a key element in our perceiving temporal properties like duration (Brown 2017). Individual differences in Alpha Rhythm seem to correlate with a difference in the fusion threshold among individuals and, last but not least, the *wagon wheel illusion* (see below) manifests itself in a very specific range of temporal frequencies, which is compatible with the estimation of 10-13 Hz of the Alpha Rhythm. It is very tempting to interpret this discrete sampling of attention by the implementation of the "ephemeral" perceptual experience by Chuard.

The *wagon wheel illusion* is considered the ultimate empirical support to the camera analogy. Indeed, while watching a film it frequently happens to see the wheels of a car, for example, to move in the opposite direction respect to the direction of the car itself. This is due to the fact that the camera takes instantaneous snapshots of the car at a very fast pace. Thus, it happens that in subsequent pictures of a wheel running clockwise, two points A and B find themselves in the position depicted by fig.3:
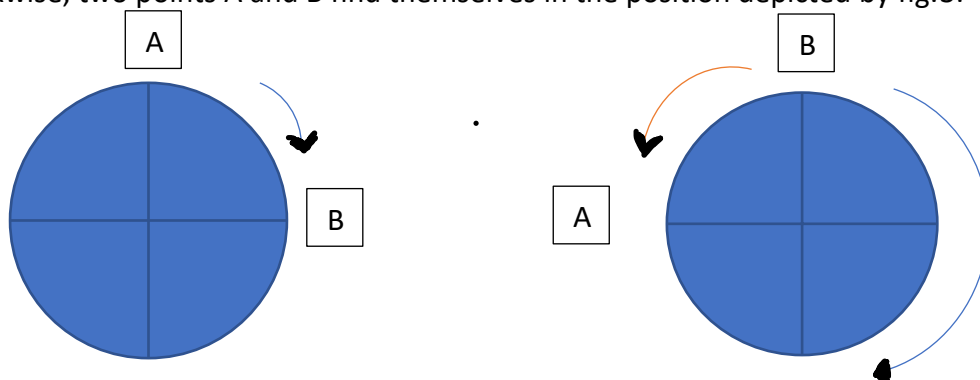
Fig 3 Wagon Wheel Effect. The blue arrows represent the actual rotation of the wheel. The orange arrow represents the perceived rotation.

Since the there is no significant qualitative difference between the A and B points, if the wheel rotated anti-clockwise, there would be much more similarity between the two snapshots (just one point moves on shorter distance), in respect to the opposite but veridical situation, in which both points move covering a broader distance. It is now recognised that the wagon wheel effect is widespread also in absence of a

video-camera as an intermediary, under conditions of constant luminosity[38] (Busch and VanRullen 2014; Holcombe 2014). This gives more support to the idea that our perceptual system works by periodically sampling information form the environment. Indeed, it provides discrete samplings of information of around 100ms, within which temporal information gets lost.

Aside to these many *virtues,* there are also inescapable difficulties, which makes the Resemblance Theory a theory to reject. The classical objection is that Chuard's proposal is anti-phenomenological (Prosser 2016; Dainton 2018), *i.e.* it is not able to deliver the phenomenology of t-events. But this is not a difficulty at all. Indeed, as it should be clear from the discussion, nobody denies the phenomenological appearance of t-events. What is denied is that temporal relations appear within the perceptual content and the Resemblance Theory gives us a way to understand why the phenomenology of change still takes place: these relations appear *somewhere else*, namely "at the level of the stream of consciousness".

However, it is not fully clear how to make sense of this idea. This because either the phenomenology of t-events is delivered by a higher-order state or it is free-floating, and by that I mean that there is no mental state to which this phenomenology is anchored. In this latter case it comes to be theoretically costly: since it is completely unclear how to understand phenomenology in abstraction of any mental state. Not even irreducible anti-representationalist qualia theorists *a là* Block (2003) admit phenomenology without mental states. Thus, the parsimony argument falls in this case.

If a higher-order state is involved, then the view comes to be empirically costly, since there is no evidence of such t-events-dedicated states. But the costs are not over. Firstly, the parsimony argument falls again, since admitting this kind of representational higher-order states makes Chuard's theory to be the only one committed to the controversial doctrine of cognitive phenomenology (Pitt 2004).

Secondly, and most importantly, a compelling objection by Hoerl (2013, 2017a, 2017b) arises: the Resemblance Theory is deeply committed to a vicious regress. The very idea of exploiting the resemblance between the temporal profile of the stream of

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[38] A nice example of the wagon wheel illusion can be found here: https://michaelbach.de/ot/mot-wagonWheel/index.html

consciousness and the temporal profile of the unfolding event is an explanatory vacuous move. By assuming that the order and durations of the perceptions make us appreciate the order and duration in the world (through perhaps high-order states), the problem comes to be pushed back on how we are able to appreciate the temporal profile of the stream. The high-order states we have postulated should give us the sense of change and succession by representing the order and succession of the perceptions: thus, the very same problem of accommodating the relational principle for temporal properties is transferred to those higher-order states.

Finally, the temporal properties of the t-events that are available in our introspection are clearly internal properties of vehicles' arrangements. Thus, this view is highly anti-transparent.

Several empirical considerations work in favour of the Resemblance Theory, but other can be interpreted to *run against*. The first one comes from *Akinetopsia,* or motion blindness, an impairment linked to a damage in the posterior visual cortex. Patients suffering from *Akinetopsia* report their inability to perceive motion. They claim to perceive the world through sequences of stroboscopic, discontinuous snapshots, of the kind posed by the Resemblance Theory. Their impairments make it difficult to perform simple tasks as pouring tea in a cup, since they perceive the tea as "being frozen". They are unable to stop since they cannot perceive any movement in the filling cup (Arstila and Lloyd 2014: 159). Dainton (2018) interprets this data as a source of damage for the Resemblance Theory, and he is right. However, his conclusion is driven by the assumption that the Resemblance Theory denies *Pheno-Temporal Realism,* and thus he concludes quite straightforwardly that, if there is no motion phenomenology from the beginning, then it we do not know what Akinetopsia patients have lost. However, we know that it is misleading to attribute *pheno-temporal anti-realism* to this theory, but the problem remains. *Akinetopsia* still shows that the "ingredients" posed by the resemblance theorist to account for the perception of succession from the succession of perceptions are still *insufficient.* Patients with *Akinetopsia* have their perceptions as temporally arranged in the right way, their contents are sufficiently similar, and there is no evidence for a slowing down in the information sampling pace. Thus, it seems that

the resources given by the Resemblance Theorists to explain the phenomenology of t-events does not make her able to meet the Jamesian Slogan.

We have seen that *prima facie beta and phi* phenomena seem to give support to the idea of the Resemblance Theory: they demonstrate that an appearance of motion can arise from the perception of instantaneous stimuli. However, there are more sophisticated versions of these experiments that *run against it*. The first one to consider is the *colour and shape apparent motion* (Kolers and von Grünau 1976). In this version of Whertheimer's experiment, the two presented instantaneous stimuli are separated by 60 ms. They not only differ in position, but they also differ in colour[39] and shape, passing from a triangle of the first stimulus to a square in the second stimulus. Participants in the experiment report to see the first stimulus changing colour abruptly, while the shape is perceived changing continuously. In these variations of the apparent motion effect, there will not be sufficient *similarity* between the two stimuli in order to get the impression of a coherent change. Indeed, the stimuli are characterised by two properties each (shape and colour), and they are different in both these respects. According to the prediction by Chuard (see above), subjects should have reported a discontinuous perception due to the dissimilarity and clearly this is not the case.

A possible line of reply is to posit at the subpersonal level a revision of the information about the first stimulus, due to the subpersonal elaboration of the second stimulus. Thus, what is going on here, is that phenomenology of change occurs after the elaboration of the second stimulus begins and we would be presented with something like the following sequence: the first stimulus, the various stages of the changes and finally the second stimulus. So, the subpersonal elaboration would supplement the phenomenology with those missing contents in order to make us perceive smooth change. This a version of the so-called the *Stalinesque* strategy (Dennett 1991, Dennett and Kinsbourne 1992). We will assess all the problems of the Stalinesque strategy in sections 2.2.2 and 3.2.6. Right now, it is worth pointing out that by going Stalinesque the Resemblance Theorist loses all the intuitive appeal of her theory given by her cinema metaphor: motion in cinema appears as long as images run, there is nothing that "fills gaps" between one frame and another.

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[39] Here a demonstration: https://michaelbach.de/ot/col-colorPhi/index.html

Finally, not even the wagon wheel effect is straightforwardly interpreted as supporting the analogy between our perceptual system and the video camera. There are accounts of the wagon wheel illusion that appeal to defects in our motion detection mechanism. According to these proposals, our system of detecting motion keeps track of two disparate positions and it usually gives the right prediction if an object first pass through the first position and then to the second. The impression of the inverted motion can be triggered by the passing of the spokes of the wheel trough the detector at the right time. In this interpretation of the wagon wheel effect no sequences of snapshots are necessarily involved, since the motion detection mechanism is always "online" (Holcombe 2014).

Other empirical and theoretical issues that seems to run against the resemblance view can be found in sections 2.2.2 and 2.3. Now, let's move to the *Dynamic Snapshot View* by Prosser (2016, 2017) and Arstila (2016a, 2018), which update the Resemblance Theory with some sophistications. Again, my strategy will be to explain all the virtues of this more advanced model, and then I will explain why it is ultimately unsatisfactory.

2.2.2 The Dynamic Snapshot View

The Dynamic Snapshot View arises with the attempt to bring the phenomenology of t-events "back into" the perceptual content. The working principle to generate the phenomenology of t-events is the same of the Resemblance Theory except for some information about motion and change which are encoded within the instantaneous contents. As we will see, this proposal overcomes some of the difficulties affecting the theory by Chuard. The two versions of this theory have been developed by Valtteri Arstila (2016a, 2018) and Simon Prosser (2016, 2017). They are very similar in spirit and much of the discussion by the two authors relies on similar considerations, heavily driven by empirical findings. For these reasons I will focus on Arstila's version, which is the most sophisticatedly elaborated. Indeed the "main" distinction between the two is that according to Prosser, at each instant we are presented with an object "moving at velocity *v*", while Arstila claims that we have a distinctive motion *quale* at each instant of the object's movement. Given the general representationalist framework by Prosser (2016), it is plausible that the information about the movement of the object at any

time, namely *that is moving at velocity v, is* the *motion quale* by Arstila (2018)[40]. I will say something about the other difference, namely the different sub-personal mechanism underling this peculiar phenomenology, at the end of this section. Let us now focus on the proposal by Arstila (2016a, 2016b, 2018).

The Dynamic Snapshot Theory tries to accommodate three *desiderata* posed by its author (Valtteri Arstila 2016a; 2018):

- **Punctuated Contents***:* the content of the perception has no temporal depth.
- **Minimal Delay***:* we perceive as soon as our sub-personal elaboration ends. There is no further delay.
- *Temporal Isomorphism:* the contents of the perceptions share the same temporal properties of the underlying neural vehicles.

We have already encountered these principles: *Punctuated Contents* is the shared assumption behind all deflationist models. It is the denial of the specious present. *Minimal Delay* shoul be assessed within the broader framework of the Stalinesque strategy (section 2.2.1). As we will see (section 3.2.4), the subpersonal manipulation is often accompanied by an extra-delay in the sub-personal elaboration, according to which the elaboration of the first stimulus remains in latence after its elaboration is ended in order to interact with the elaboration of the second stimulus. So, *minimal delay* requires either to avoid the Stalinesque strategy tout court, or to provide an alternative version of it. And, we will see in a while, the latter is where Arstila wants to go. *Temporal Isomorphism* states that the order of the neural bases of the two contents A and B of a conscious of the type "A before B" is the same of the order of which the two contents are consciously experienced. Thus, the neural realisation of content A comes before the neural realisation of the content B. *Temporal Isomorphism* is the sum of two principles we have encountered in section (1.2), namely the *identity principle*, according to which

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[40] The representationalist idea is of an intimate relation between the intentional content <x is moving at velocity v>, and the phenomenal character associated to movement, i.e. the motion quale. Moreover, Prosser (2016: 127) claims that this remark can be also accepted by a naive realist, which is indeed presented to an object moving at a certain velocity at each instant of her experience of motion. In the same vein, the peculiar phenomenal character of motion, i.e. the motion *quale*, can be accounted for by the naïve realist.

the time of a perceptual act is the same of the time of its vehicle and the *Braintime View*, according to which the temporal order in which the perceptions are realised mirrors the order of the perceived elements.

So far, it is not so different from the Resemblance Theory, since both *Minimal Delay* and *Temporal Isomorphism* view can be accepted by Resemblance Theorists. However, the Dynamic Snapshot View diverges for another point:

- **Purity of motion and succession phenomenology**: the phenomenology of motion can occur even without the perception of different locations. The phenomenology of succession may occur without the phenomenology of any order.

The core idea behind Arstila's proposal is that there is a *distinctive motion quale* which is included within the content of the snapshot perception. Let us take the case of the rolling bowling ball on the line. It occupies locations L1, L2, L3 respectively. According to the *Dynamic Snapshot Theory*, we undergo a series of sensory experiences *e1, e2, e3* representing locations L1, L2, L3 respectively and a *pure motion quale* is associated to each location. Thus, each sensory experience provides us with *two different pieces* of information: 1) the ball location at a certain instant and 2) the fact that the ball is actually moving. The coherence of the trajectory (namely its order, the fact that the ball does not move from the centre of the line to the players hands and then to the pin) is due to the fact that the order of the elaboration of the contents follows those of the vehicles (*BrainTime View*). This latter has to follow the order of the different locations occupied by the ball, due to the same causal considerations of the Resemblance Theory (section 2.1.1). At the phenomenological level this reflects the idea of smooth change. If the trajectory of the ball would have been incoherent, we would have had the conscious experience of abrupt change. However, it is also interesting to note that in accounting for the abrupt change's phenomenology, Dynamic Snapshot Theorists seem to renounce to part of their account: abrupt change is just a matter of qualitatively dissimilarity among adjacent contents. It is not delivered by *pure phenomenology* like smooth motion*.

Overall the Dynamic Snapshot View is no doubt better than the Resemblance Theory. The empirical data supporting the idea of a stream composed by momentary perceptions (Wagon Wheel, studies on the Alpha Rhythm etc...) can be transferred here. The same is true also for the theoretical virtues of the Resemblance Theory, except for the idea of parsimony (which, in the end does not stand for the Resemblance Theory either): Specious Present Theories are not committed to *pure motion and succession qualia.*

However, this is not really a cost for the Dynamic Snapshot Theory in respect to the Resemblance Theory: *pure phenomenology* may also help to overcome the difficulties posed by Hoerl (2013, 2017a, 2017b) according to which there is a vicious regress in accepting that the phenomenology of t-events arises from the temporal profile of the snapshots within the stream. According to the Dynamic Snapshot View, the phenomenology of motion, change and persistence[41] is brought back into the instantaneous perceptual experience. Moreover, their *purity* guarantees that there is no need to contrast "several sensory experiences" over time in order to have the perception of t-events, as in the case of the Resemblance Theory. This avoid the postulation of higher order states.

Of course, the core of the proposal, namely that it is possible to detach the representation of motion from the representation of different locations might strike as paradoxical. Even more, if we consider that the idea is to allow punctuated contents with no temporal depth to be able to represent a temporal phenomenon like motion.

 To draw his conclusion Arstila (2016a, 2016b 2018) relies on empirical *data.* In particular great support from this distinction comes from the *motion aftereffects,* where, after a previous phase of adapting to a constant motion which suddenly stops, a instantaneous dot image seems to move in the opposite direction in respect to the previous motion[42]. This is usually explained in terms of a "relaxation" of neurones after being overexposed to motion. However, the interesting point is that this phenomenon seems to show that it is possible to perceive a stationary stimulus "to move and not to

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[41] Although it is not explicit in neither Arstila's (2016a, 2018) and Prosser's (2016,2017) writings, it seems reasonable to me that that the phenomenology of persistence is the default mode: it arises when there is no pure phenomenology of motion or change.

[42] Here is an example of motion aftereffect https://michaelbach.de/ot/mot-adapt/index.html

move at the same time" (Arstila 2018: 4). Another common motion illusion, involving just fixed images is the *Rotating Snake illusion*[43].

Thus, Arstila postulates two different mechanisms, one to perceive the various locations of the ball at each instant, and one to detect motion. Similar lines of reasoning are goven for the separation of the *pure succession*. In this latter case there are empirical findings according to which two tones separated by less than 2ms can be heard as *nonsimultaneous,* but we cannot discern their order (Arstila 2018: 11). Therefore, we may be aware that something has changed, but this is independent on the ordered sequence of the phases of the changing t-events. Thus, the idea is that there is no need for a specious present, since the purity of the phenomenology of motion and succession is all we need for having "a conscious experience of succession from a succession of perceptions".

This helps to overcome some of the empirical and theoretical challenges faced by the Resemblance Theory. Indeed, the continuity of motion in colour and shape *phi* is explained by the presence of pure motion and not merely by the similarity among contents. *Akinetopsia* is easily accounted for as the specific impairment of the mechanism responsible for the generation of the motion *quale.* The perception of motion is not free-floating or part of a higher-order states, since it is part of the content of our perceptive acts.

It is worth to bear in mind that the whole conception by Arstila is driven by the idea that the *BrainTime View* is in place, thus that there is a correspondence between the temporal relations represented in the perceptual contents and the temporal relations of the *neural vehicles*. These mirroring constraints still make it difficult for the *Dynamic Snapshot Theorist* to account for postdictive phenomena, such as *phi* and *beta* motion. Given the *BrainTime View* underling the Dynamic Snapshot, one should indeed expect that the perception of the first stimulus is elaborated first, followed by the perception of a blank screen e and finally by the perception of the second stimulus. Thus, we should not perceive apparent motion according to this view. Moreover, we have seen in the previous section how the idea to demand the explanatory work of this

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[43] Here is an example of the Rotating Snake Illusion https://michaelbach.de/ot/mot-snakes/index.html

peculiar phenomenology on the similarity of the contents fails for the most complex cases of *phi and beta* motion. This is particularly pressing for the Dynamic Snapshot because of the commitment to the *minimal delay* thesis[44].

Arstila (2016a, 2016b) gives an extensive reply to this question. His idea is that the sub-personal elaboration of the visual stimuli follows a *Non-Linear Braintime View (NonLinear Latency View).* This is a form of Stalinesque revision (since it manipulates contents sub-personally before they reach consciousness) which puports not to have extra-delays after the elaboration endpoints. Thus, in the case of the elaboration of stimuli like those involved in postdiction effects, we should take count of the different elaboration path of visual stimuli (Kandel 2013). Indeed, in visual perception, motor information is separated from the information of other visual properties, like colour and shape, already in the retina. There are two streams to elaborate visual information: *the dorsal stream,* running to the *primary visual cortex* V1, passing to the *motor area* V5, to the posterior parietal cortex; and the *ventral stream,* running from V1 to the temporal lobe*.*

The "finer" properties (color, shape etc..) go through the ventral stream, to the *primary visual cortex* V1 and to the following areas for their elaboration. The information about motion goes through the dorsal stream through V1 to reach its elaboration area V5. This suggests that information in the dorsal stream is elaborated significantly faster than information in the ventral stream. Indeed, there is also evidence that V5 comes to be activated 30ms faster than V4, the area for the elaboration of colour (Arstila 2016b). Moreover, other evidence suggest that V5 comes to be activated also contemporary to V1, suggesting that some information about motion *bypasses* the *primary motor cortex.*

This series of internal delays is the heart of the *"NonLinear Braintime view"* on colour *phi*:

> "At t_1, A (e.g. red dot) is presented and our perceptual system begins
> to process it. Because nothing implies motion, this happens through

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[44] It is worth to point out that after presenting his Dynamic Snapshot View, Prosser (2016, 2017) relies on the same arguments by Dennett (1991) and Dennett and Kinsbourne (1992) in order to cast doubt on both the *Stalinesque vs Orwellian* account for postdiction (see section 3.2.4). As Prosser himself maintains (2016) this comes to undermines part of the reasons why the debate is framed.

the   pathway   that   processes   stationary   stimuli.

At t_2, an empty screen is presented and our perceptual system begins to process it. Because nothing implies motion, this happens through the pathway that processes stationary stimuli [the ventral stream ndr]. The processing of the properties of A are completed or nearly completed.

At t_3, the processed properties of A are used to construct an object representation and we experience A. B (green dot) is presented and our perceptual system begins to process it along two pathways in parallel. One of them concerns motion [the dorsal stream] and the other [the ventral stream] concerns other visual properties. The processing of the empty screen is nearly completed.

At t_4, the processing of an empty screen is completed. We do not experience it, however, because the motion processing is completed too and the experience of motion begins. At this point the moving stimulus is experienced as having the properties of A (red dot). (At this point an empty screen is presented again and our perceptual system begins to process it, and continues to process it as long as it is shown.)

At t_5, the processing of the properties of B are completed. They either replace the properties of A (the moving stimulus turns green) or become integrated with the properties of A (the moving red stimulus turns from red to green through being yellow).

At t_6, the properties of B form a new object representation (green dot), and we experience B." (Arstila 2016b: 352)*.

The overall strategy by Arstila should be clear: he proposes a snapshot conception, which is *endowed with* the purity of phenomenology of motion and succession. In order to overcome the difficulties posed by *postdictive phenomena,* he proposes to shift the analyses to the *neural implementation* of the snapshot conception, namely the *NonLinear BrainTime view* and explain how these phenomena are related to the timing of implementation.

For sure the Dynamic Snapshot Theory is an improvement over the Resemblance Theory, and it is interesting how it is able to account for more empirical data than its "cousin". However, I think that ultimately it has some problems.

On the empirical side, we should consider that it works well for vision, but there is evidence for postdictive phenomena for other modalities. Namely touch and audition. The famous Cutaneous Rabbit is an example. In the simplest case, participants are given three taps following regular intervals of about 40ms-200ms, on different locations of the arm. At the wrist, then 10 cm up to the arm and finally near the elbow. Subjects report taps to be mislocalised toward the next location, as if the stimuli where uniform, suggesting that the perception of the following stimuli has a "backward effect" on the perception of the previous ones (Shimojo 2014). Similarly, it is well known in psychoacoustic the diffusion of backward masking, the retro-effect a second stimulus has on the perception of the. The presence of another auditory stimulus, different in volume and frequency from the target, may prevent or alter the recognition of the target stimulus. The interesting point is that this effect can be seen also when the second masking stimulus appears *after* the target, separated by an interval of 15-20ms (Gelfand 2009).

In the case of the Cutaneous Rabbit, the snapshot conception should predict that we feel all taps at the wrist, then all taps at other locations, following the order in which they are elaborated. In the case of the auditory backward masking, we should elaborate the first sound first, followed by an interval and then the second stimulus, following the order of elaboration of the stimuli. Thus, this seems to suggest that something more has to be added to account for the *nonvisual* postdictive phenomena. Indeed, mechanisms underpinning the phenomenology of *pure change* in audition or in the somatosensory system have not been advanced yet and a *NonLinear BrainTime view* is not available yet. Of, course this is not knock down objection, since we may soon discover other ways to extend the NonLinear Braintime to other modalities.

However, I have got theoretical reasons to be skeptical about it. One of the point that Arstila (2015b, 2016a)[45] reapeatedly stresses is that these postdiction effects are due to the interaction of the elaboration of the second stimulus and the *re-entrant* process of the first one, rather than the "local" difference in elaboration of the various properties of the stimulus in different areas. Roughly, the idea is that in order to reach the elaboration-endpoint (and thus become conscious), the information of the stimulus

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[45] And I am indebted with Vallteri Arstila himself for pointing out this to me, which I admitedly completely mistook.

should, in a sense, "come back to the starting point" of elaboration, by closing an information loop. It is easy to see that, despite the lack of empirical evidence available, this model may help with auditory backward masking: the elaboration of the second stimulus in a dedicated area may disrupt the final elaboration of the re-entrant process in that area. This causes the first stimulus not to be perceived, since its information gets lost in this way.

However, this is not enough for phenomena like apparent motion and Cutaneous Rabbit, where properties mistakenly attributed to the initial stimulus can be given only after the presentation of the second stimulus . Here the difference in the elaboration time of the various properties of the stimulus have a play to role in order to justify why we perceive a temporal order different from that of the stimuli. Indeed, the violation of *Metrical Mirroring* in case of apparent motion is due to the fact that only by presenting the second stimulus, we may attribute motion to the first one. In other words, the explanandum is why we perceive motion *before* perceiving the second stimulus, since we attribute motion to the first stimulus in a coherent perceptual experience. As it is formulated now, there is still no reason why the first stimulus should be interpreted moving. Indeed, so far, the first stimulus should follow its path until V1 without having been integrated with information about motion. The second stimulus seems to pursue the same path independently. To sum up, we need a story of why a property of the second stimulus (motion) is attribuited to the first stimulus. The answer is to appeal to the difference in elaboration of varius processes (which is plausible given that different areas are involved for these). Motion is elaborated faster than the other features, also because motion signals bypass V1 in his elaboration, so becouse of this, they can end up been inglobated in the re-entrant process of the first stimulus, generating the illusion.

This brings about my first concern. The story about apparent motion is not applicable to other phenomena like the Cutaneous Rabbit. Indeed, the explanation of apparent motion is reached by appealing to the idea that *different kinds of properties* are processed differently (and this is especially true if we take into account different brain areas making the processing). It is only because motion is a different property than the other of the second stimulus, that it can be processed fast enough to be part of the re-entrant process of the first stimulus. This difference in kinds of properties (and in dedicated brain areas) is especially vivid in the in the case of *colour and shape apparent*

motion (the example in the quote)*.* Here we clearly have two different streams processing different kinds of properties: *motion* and "*static" properties* (colour and shape).

The same remarks cannot be applied to nonvisual postdictive phenomena especially the Cutanous Rabbit. It is true there is evidence of a double dorsal/ventral system distinction also for audition and the somatosensory system. These streams are connected to the visual pathways and they follow the general rule according to which the ventral stream is in charge of stimuli recognition, while the dorsal stream is in charge of spatial location and motor tasks (Kandel 2013). However, in the case of Cutaneous Rabbit, the task is to judge about properties of the *same kind*: namely participants are asked to judge only the temporal and spatial location of the taps. No recognitional tasks about the nature of the taps is involved. So, we cannot appeal to the difference in processes speed to make sense of the illusion, since there is just one kind of process involved (it seems reasonable to assume that the relevant neural activations are only in the dorsal stream[46]).

The second point that I want to make takes again into account auditory backward masking. If the idea is that the re-entrant process interacts with the elaboration of the second stimulus, this means that the loop of the information processing of the first stimulus should be long enough in order to interact with the second one. So, it seems to me that the advantages of Minimal Delay in the NonLinear Version of the Stalinesque Strategy are more apparent than real: instead of saying that the elaboration of the first stimulus ends and a delay makes it the case that the second stimulus interacts with it, we are assuming that the subpersonal elaboration is *delayed* enough before reaching the endpoint. In a way or in another, the Stalinesque Delay (section 3.2.6) is still in place.

2.3 Memory Theories

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[46] This point would be stronger if we had also "reverse cutaneous rabbit illusions", namely illusions from the arm to the wrist. This in order to avoid the obvious complain according to which the difference in latency can be due to the different length of the path from the wrist to the brain in respect to the path from the arm to the brain. I did not find anything in this respect, but there is a study suggesting that the rabbit goes "out the body", since participants feels the tap as occurring in a stick grasped by the two hands, after taps are given to the fingers of the two hands (Miyazaki, Hirashima, and Nozaki 2010). Here I take the paths of the two signals to be of the same length.

2.3.1 Standard Memory Theory

The Standard Memory Theory (from here on just "Memory Theory") has a long tradition in philosophy. Augustine of Hippo (398), one of the first to puzzle on how it is possible to measure time, notoriously held that memory acts should help. Thomas Reid (1785) explicitly endorses it. Nowadays it is supported, among the others, by Robin Le Poidevin (2007).

The idea at the base of the Memory Theory is that the perception of a succession at a time is possible with the help of another faculty in play other than perception: our memory. Thus, Memory Theorist runs up against what we have called "*the immediacy thesis*" (section 1.7.1). While, strictly speaking, the contents of our perceptions are instantaneous, information about the previous stages of the perceived t-event are stored in memory to make us aware of the unfolding of the event.

Usually, and this is the line of Le Poidevin (2007), it is the *short-term* memory to be chosen to accomplish this. This for a series of reasons. Firstly, it is not under voluntary control as other kinds of memory, *i.e.* long term memory. Secondly, it can draw a precise difference between hearing a melody (for example A-B-C) as unfolding in time and the perceptual experience of C along with the memory of A-B occurred an hour before[47].

Thirdly, it is possible to appeal to short-term memory to make sense of cases of motion aftereffects like the *Waterfall Illusion* (section 2.1.2)*.* The explanation by Le Poidevin (2007), following Gregory (1966), is that our perceptual system may be composed by two different mechanisms: one tracking pure motion as happening '*now*' (providing us with the sense of motion) and the other one tracking changing location. While the first, more primitive, keeps track of motion, the short-term memory collects the various positions of the perceived object in order to make comparisons among them. In the case of the Waterfall illusion, there is a breakdown of the two systems. They give rise to a contradictory phenomenology: the information in perception is that the object moves, but there is no changing location in short-term memory. In case of ordinary motion perception, memory is still required to deliver us the phenomenology of a

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[47] This objection is by Dainton (2000). See also Phillips (2010).

coherent change, based on the confrontation of the various phases of the change (for example, the different locations occupied by a moving object).

This is dramatically similar to the Dynamic Snapshot View by Arstila (2016a, 2016b, 2018) and Prosser (2016), since the idea of a double mechanism responsible for the elaboration of pure motion and changing location respectively is present in their snapshot view (section 2.1.2). They all agree on the fact that pure motion is included in the punctuated perceptual content. *Prima facie* it seems that the only difference regards the mechanism responsible to deal with the different locations of the moving ball. The single snapshots for Arstila and Prosser, *short term memory* for Le Poidevin (2007)[48]. However, this is a crucial point of divergence since it has to do with how to solve Kelly's paradox.

According to the Memory Theory the unitary conscious experience of t-events is guaranteed even if perceptual acts are instantaneous. The diachronic unity seems to be captured by the joint effort of the two faculties, whose respective contents generates the phenomenology of t-events. And, above all, it is reached because the memory *stores and compares* the previous phases of the t-event we are experiencing with the occurrent phase present in perception. Thus, all these contents, the present one and the past contents stored in memory are presented to the subject *simultaneously,* given both a perception-like act and an act of memory.

Let us consider the example of the bowling ball once again. According to the Memory Theory, the fact that the ball moves with a coherent trajectory from the hands of the player toward the pins is the product of the comparison of the previous locations occupied by the ball and the actual one. Then the information that the object in the perception is moving, i.e. pure motion, completes the conscious experience. This does not hold for the Dynamic Snapshot Views: in this case the coherence of the trajectory of the ball is the product of the order in which the snapshots appear, each of which includes the pure motion *quale*, as it happens for the *Resemblance Theory* (section 2.1.1).

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[48] Interestingly also Prosser (2016) postulates that short-term memory has a role, making the Snapshot Conception View even more similar to LePoidevin's.

Many complaints to the Memory Theory (e.g. by Dainton 2000, 2018) are directed at the explicit denial of the *immediacy thesis, viz.* the Memory Theory does not deliver the right phenomenology since our phenomenology of t-events is as vivid as that of colours, odours and sounds. These properties are captured by acts of perception, which are not mediated by memory. The idea by Dainton, I recall, is that generally speaking, memory contents are always less vivid than perceptive contents. Thus, an experiential content mixing both should come to be less vivid than a pure perceptive content (Section 1.8). However, we have already discussed in section 1.8 how this objection falls short: it may be the case that the vivid conscious experience of motion just is to have a single, present, vivid part and other less "vivid" phases stored in memory. This because it is not necessary that the lack of vividness of the previous phases of motion comes to be transferred to the conscious experience of the motion as a whole. Moreover, Le Poidevin (2007) does not even need this observation: by admitting the possibility of *pure motion* and *pure succession,* he can avoid appealing to previous phases of t-events in order to make sense of motion and succession phenomenology. For these reasons the appeal by Dainton (2018) to *apparent motion* as the demonstration of a vividness in the conscious experience of motion regardless on the effective presence of motion is unconvincing. In the same vein, the appeal to *Akinetopsia* is easily explained by a theory allowing for pure motion: it is the breakdown of the dedicated system.

Another line of criticism on phenomenological ground is by Phillips (2010). He suggests that if our perception of t-events ultimately rests upon two discrete, distinct conscious acts, they should be introspectable. However, whilst we have a distinctive phenomenology for short-term memory in many cases (for example, with my eyes shut I can visually remember the scene I have just seen – to borrow an example by Phillips himself), it seems that we have no introspective access to the contents our memories involved in perceiving t-events. This seems to suggest that there are no two different acts in play. This objection is very interesting because it is based on opposite considerations in respect to Dainton's. While Dainton complains that the phenomenology of motion should not be, in a sense, *real enough,* given the rejection of the immediacy thesis, Phillips reverses the problem. He admits that *Pheno-Temporal Realism is true* for the Memory Theory, but then asks why this does not disclose a

difference between memory and perception. This is important, because such a phenomenological difference *would motivate* the Memory Theory in respect to the Specious Present Theory (section 3.1).

A line of reply can be found in Le Poidevin (2007)

> "The description of the phenomenology should not be too clear-cut. For the truth of the matter may be that experience does indeed give us the impression of change and succession, but no very clear sense that this belongs to a particular moment. We are aware of it, and that is all. Describing succession as phenomenologically present does not tie it down to a moment. Allied to this is the thought, urged by Dennett (1991), that there is no definite moment at which a piece of information becomes conscious." (Le Poidevin 2007: 92).

As far as I can see, Le Poidevin bites the bullet and piggybacks on the idea by Dennett (1991) that it is simply incorrect to think there is a clear-cut divide on *when* a content comes to be conscious, that is to say, in perception. Thus, since there is no way to understand when it gets perceived, there is no way to make a distinction between perception and memory (cf. Le Poidevin 2007)[49].

I am sympathetic with this line of reply by Le Poidevin but, so stated, makes memory theory collapses in a form of specious present theory if we think that the distinction between present and past content gets blurred.

2.3.2 Non-Standard Memory Theory

A form of *Non-Standard Memory Theory* is also available according to Phillips (2010). In this form, our phenomenology of t-events is not due to two distinctive acts of conscious experience. Indeed, we only perceive the *present instant*, but the content is *constitutively dependent* on what happened in the past. The perception of a "rat" can be both being perceived as part of a larger auditory act encompassing "tat", or not, if nothing happened before. Thus, the present "rat" can be perceived "as being preceded by the tat", or "as being preceded by silence". In this way, what happened before the rat makes a constitutive difference in the formation of the content of perception, which is strictly speaking still confined in the present.

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[49] I interpret the example of sentence disambiguation he makes (2007: 92) to show exactly this.

The reason why it counts as a memory theory, according to the original proposers, should be found in the idea that all kinds of memories aim to preserve a "cognitive contact" with the past. This is to say they each maintain a relation with a content acquired in the past. For example, my semantic memory helps me to preserve knowledge on a bit of information acquired in the past. The episodic memory helps keeping a perceptual content apprehended in the past and so on… Since some cognitive contact with past contents is necessary for the perception of the present one, this theory can be considered a Memory Theory (Phillips 2010).

According to Phillips (2010), this theory overcomes the phenomenological difficulties of the standard form of the memory theory. Indeed, since no act of memory is strictly speaking in place, the phenomenological difference between perception and memory is not a problem. Moreover, introspection gives us grip on the past content, since it is embedded in the present content of perception. Finally, because only perception is in play, one may argue that the immediacy thesis is also met: the faculty of memory is not at work.

There are no supporters of this theories nowadays, and for a good reason expressed by Hoerl (2009). On the one hand, it is committed to the idea that we perceive only present contents, so there is no "cognitive contact" with the past in perception. On the other hand, the "contact with the past" must somehow be preserved in order to make a constitutive difference among contents preceded by different past facts. The perceptual content should have no temporal depth, in order not to boil down onto a Specious Present Theory, but it should provide temporal information about past elements in order to constitute the present content. It is hard to resolve the tension between the two requirements in a way that does not open up for Retentionalism (see section 3.3) (cf. Hoerl 2009).

2.4 Deflationist Models, Taking Stock

Broadly speaking there are two kinds of deflationist models, the Resemblance Theories (the Resemblance Theory and the Dynamic Snapshot View) and the Memory Theories (standard and nonstandard) (Hoerl 2014a, Hoerl 2014b). The common point of all is that

our perceptual contents are instantaneous and therefore perception alone is not able to account for the phenomenal appearances of t-events.

What is more appealing about the resemblance approach (Resemblance Theory and Dynamic Snapshot View) is the great amount of empirical data supporting the discrete view of the stream of consciousness, and the idea that the visual system literally works like a camera generating sequences of snapshots. However, this force is, in a sense, also a weakness: the resemblance approach is too heavily modelled on vision, generating puzzlement about how it is possible to have unified conscious experiences from other modalities.

As it is sometimes claimed (for example by Lee 2014a), instantaneous nonvisual experiences of sounds are not even conceivable. It is often argued that since sounds intrinsically requires time, due to the waive-like nature of their transmission, they cannot fit into pictures of the world as visual images do. Whilst it is possible to break down motion as being the sum of instantaneous images, the same does not help with sounds, since instantaneous sounds can be only pitch-less clicks. A possible reply would be to appeal to a Dynamic Snapshot Conception for sounds. In the case of vision, the phenomenology of motion and succession is due to mechanisms responsible for pure motion and pure change. In the case of sounds, the instantaneous clicks are encoded with information about "pure pitch" or something along these lines. This may be viable, but it is extremely costly: the proliferation of such mechanisms for all modalities (which they must be all structural isomorphic to vision) seems very demanding from a computational point of view and it requires a lot of empirical confirmation to be fully accepted.

As we saw, the BrainTime View which is supposed to implement the resemblance models at the neural level suffers from the theoretical problem by Dennett and Kinsbourne (1992) of being committed to a centre of control where all perceptual experience converges and becomes conscious at a certain time: the "Cartesian Theatre". As we will see in section 3.2.6. The cost is either a Stalinesque revision (with either the rejection of *minimal delay* or the problems of the NonLinear Latency about nonvisual modalities) or an Orwellian rewriting which, we will see in the next chapter, is incompatible with any interpretation of Metrical Mirroring.

The other family of deflationist theories are the "Memory Theories", the appeal to memory, which is multimodal, may help at overcoming the difficulties of the resemblance approach. Moreover, it does not suffer from the problem of the vicious regress, since memory makes us available the previous phases of the t-events in order to make order and duration judgments. However, Memory Theories are unstable, since both the Standard Version and the Nonstandard Version seem to boil down to Specious Present Theories. The Nonstandard Approach requires that a cognitive contact with the past has to be maintained, and thus that temporal information other than the present must enter in our perception. The Standard Memory Theory has to face the objection that it is somehow arbitrary to pose a divide line between memory and perception in our conscious experience of motion, since the two are not separated in introspection. Again, this feature makes the Standard Memory Theory similar to a form of the Specious Present Theory.

In a recent paper Jack Shardlow (2019) argued that Deflationism, in any form, lacks motivation in support of the view. He makes three cases that may be interpreted to provide support for the idea that our contents are bound in an instant and he makes strong cases against all of them. In particular, he shows that empirical data (especially the waterfall illusion) are not *per se* a reason to endorse Deflationism. I agree, whilst I think that also deflationists think so. The point with the waterfall illusion etc... is to show that the most controversial claim, namely the distinction between motion and location-change is supported empirically, rather than a direct motivation of their view.

Secondly, Shardlow shows that phenomenologically speaking there is no reason to think that our perception of t-events is made by instant-like contents, since the analogy with space suggests quite the opposite: we do not have a perception of an extended area via a sum of micro-perceptions of points. Finally, he makes some considerations about transparency to pin down the need of having both Metrical Mirroring and PSA at once.

All the point Shardlow makes are very convincing, but I believe that he did not touch upon what are the real motivations that, arguably, incline the common sense toward Deflationism. *Firstly*, the intuition according to which we cannot perceive past or future things. It seems straightforward to say, pre-theoretically, that we cannot perceive dinosaurs, but probably neither what happens one second ago. In the same vein, I cannot perceive my lunch tomorrow, but neither what is just about to happen. *Secondly*, this intuition may be motivated by some commonsensical idea that we cannot perceive non existing things and past and future things do not exist. *Thirdly*, this latter claim may be motivated in turn by presentist-like inclinations, according to which only the present moment exists, and therefore can be perceived. These three ideas, jointly, makes instantaneous contents the only option and one can grant that, at a commonsensical level, the idea of an object of perception and that of content are very close. So close that if the content is instantaneous, so must be the content. We will see in section 5.4.2 that there is only one Specious Present Theory, namely Tense Retentionaism, able to accommodate Presentism, but at the cost of the first two

intuitions. However, I side with Shardlow against Deflationism, so I am sure that we both

agree on the fact that some of these "motivations" are to be rejected.

Chapter 3: The Specious Present Theories

The deflationist models form just one approach to Kelly's paradox. The other main strategy is to deny that our acts of perception present us with merely instantaneous contents. The idea is that each one of our perceptual acts provides us with temporal information going beyond a single instant. It is immediately clear that this provides us with a way to make sense of the phenomenology of t-events: the temporal depth of the content is what is needed to capture a t-event unfolding through time. If deflationists models aim to capture the phenomenology of t-events by rejecting the *immediacy thesis,* the Specious Present Theories, aim to explain it by assuming it. They indeed perception to be sufficient alone to get *pheno-temporal realism.* The general notion of specious present will be assessed in section 3.1. The two main Specious Present Theories, namely Extensionalism and Retentionalism will be assessed in sections 3.2 and 3.3 respectively. In chapter 4 I will explain my own version of a Specious Present Theory, derived from Retentionalism.

3.1 The Specious Present

3.1.1 A Theoretical Overview:

The *locus classicus* for the specious present is William James's *Principles of Psychology*:

> "In short, the practically cognized present is no knife-edge, but a saddle-back, with a certain breadth of its own on which we sit perched, and from which we look in two directions into time. The unit of composition of our perception of time is a duration, with a bow and a stern, as it were—a rearward- and a forward-looking end." (James: 1890, 609)

How exactly to interpret what James has in mind is controversial (Le Poidevin 2015 for a review). Here, I would like to focus on the interpretation of the Specious Present which best fits the debate about perception of t-events. In particular, I would like to focus on

two interpretations suggested by Le Poidevin (2015): namely 1) the idea of the specious present is the duration which is directly perceived (cf. Kelly 2005) and 2) the idea that the specious present is the duration which is perceived as being both present and extended in time[50].

The first is a metaphysical claim about perception, while the second is a phenomenological claim, thus a description of how our perceptual experience appears to us. Perhaps LePoidevin (2015) is right at complaining that the second interpretation is the closest to what James was really after. However, I would propose to reject it in favour the first one. The reasons are straightforward: many theories of the specious present do not accept that all contents presented in our perception are presented as *equally present* (section 3.3.3). According to these theories there is a difference among the various contents presented in a single act of perception: a degree of variation in *presentedness* or different temporal modes of presentation. These theories do justice to the idea that the present is *"specious",* in the sense that it is "fake": a duration that includes the instantaneous present moment. Secondly, if it were immediately clear on introspective bases that we are presented with a duration, then the dispute between *specious present theories* and *deflationist models* would have been solved long ago. Thus, it is fair to all positions in play to interpret the Specious Present Doctrine in the first way. Thirdly and related, it could be true that we are presented with an interval in our perceptions, but given temporal transparency, this says nothing on the temporal length of contents, which is a property of the vehicle (Prosser 2016, Rashbrook-Cooper 2011).

The notion of Specious Present we are dealing with would be more metaphysical in flavour. Indeed, I take it to be an explanation of why we report that t-events are immediately perceived. All the parties in the dispute about the Paradox of Temporal Experience agree on the fact that there is a phenomenology to be explained. That is to

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[50] Le Poidevin (2019) proposes also an interpretation of the specious present in James as the life span of short-term memory. This would do justice to the extraordinary length estimated by James, 12s, as well as the idea that the specious present is necessary to understand long and complex sentences. Another interpretation suggested by Le Poidevin (2019) is the idea of the specious present as the duration which is not perceived as a duration, but as instantaneous. This is close to the "atomic" specious present proposed by Arstila and Lloyd (2014), according to which the specious present is the real time within which two successive events are not discriminated as occurring non-simultaneously. Of course, this latter interpretation is just another way to spell out the snapshot conception of the perception and it is not the notion of specious present discussed and rejected by Arstila (2018) himself.

say they all agree on the fact that we are presented with motion, change and persistence. However, they all make metaphysical claims about the structure of both the vehicle of perception and the perceptual content in order to give an explanation of these reported phenomenological facts. Thus, interpreting the specious present doctrine as a metaphysical claim helps to better understand its role at *explaining* why we report to immediately perceive t-events.

The core idea behind the Specious Present from James (1980) is that our perceptual experience does not present us with an instant, it presents us with an interval. A nice definition can thus be found in Ismael (2011):

> "The Doctrine of the Specious Present (**SP**): says that if we consider a particular temporal cross section of experience at a point t in time […], the content carried by the [cross section] has temporal breadth. It spans a finite interval of time centered on t (Ismael 2011)".

Before going on, a clarification. It is difficult to find a formulation of the specious present doctrine which is sufficiently informative, but neutral in respect to the two main specious present theories, namely Extensionalism and Retentionalism. An extensionalist would probably reject the idea of a cross-section of the experience centered on a certain instant. However, we can meet these concerns by saying that in order to account for a perceptual experience of the world at instant *t,* also Extensionalism assume that we should take into account contents occurring in previous and subsequent instants. Nothing more than this sense of "centred interval" is needed.

Ismael (2011) discloses the first main point to bear in mind: the *Specious Present Doctrine* is a claim about the temporal depth of the *content.* It is silent on the duration of the perceptual vehicle. Indeed, as it will be clear in the next two sections, the major Specious Present Theories differ on the relation between the temporal depth of the vehicle and the temporal depth of the content (Dainton 2018).

Admitting that perceptual contents are extended, i.e. that we are not presented with how the world is at single instant, opens up a way out from Kelly's Paradox. Indeed, the *relational principle* (sections 1.1 and 2.1) is safe regarding temporality: both *relata* of any temporal relation (order, succession, duration etc.) can figure in the content of a single act of perception (Ismael 2011).That is, we may *perceive* the order and succession

of various phases of t-events along with their durations within the specious present span. Thus, the idea to underline is that every theory admitting a specious present accepts the *Immediacy Thesis.* Every specious present theory is committed to the idea that perception alone is sufficient to deliver the phenomenology of t-events. Single acts of perception are able to explain how we are able to experience change, motion and persistence, without the help of other psychological mechanism like memory, pure phenomenology trackers and so on. Thus, at least in this respect, the Specious Present Theories are simpler than most deflationist models and, since the acceptance of the *Immediacy thesis* brings about the acceptance of *Pheno-Temporal Realism* (section 1.4), the Specious Present Theories are realist regarding temporal phenomenology.

Secondly and relatedly, admitting the specious present opens up the possibility of a diachronically *unified content* captured by the act of perception. The *unfolding* character of the perceived t-events is thus maintained within the single acts of perception and it is clearly different from the mere inference of change. Let us come back to Broad's clock: our perception of the second hand's movement is *genuine,* since the second hand covers enough space within the specious present to be noticed. Its movement is seen as having a *continuous motion-like* character*.* Since the hour hand does not cover enough space for its movement to be noticed, each perception (no matter how deep its content is) ends up presenting a non-moving image of the hand. Thus, we are given just a series of instantaneous snapshots of the hour hand, from which we can just *infer motion.*

This latter point opens up for a clarification. Applying the idea of the specious present to Broad's clock case may be misleading in so far as one may rightly observe that also the hour hand moves but we do not perceive it. Two related questions arise: why should not we discern the hour hand movement, since it covers as well some space within the specious present? And *vice versa*: why should we see the second hand moving, since its perception is made up by the sum of non-moving images like the hour hand case (Fara 2001)? This second question is very pernicious since it seems that it puts the Specious Present Theory back to *Kelly's Paradox*, by assuming that also within the specious present snapshots are allowed.

I guess the answer to these questions is unitary and it is just a matter of our *temporal resolution*, which is our ability to discern events on microscale. The idea is that there is simply a lower bound in the specious present under which we cannot discriminate the temporal properties of t-events. Think of it like a digital TV, we cannot discern nothing more *fine-grained* than *pixels,* however the composition of such pixels gives us the image. On the other hand, we cannot perceive images outside the screen either. The same idea applies here: our experience of t-events ranges from the lower bound to the max length of the specious present.

Empirical findings about fusion and coincidence thresholds (section 2.2) may help to understand how fine grained our temporal resolution may be. Moreover, they shed light on why sometimes the specious present is dubbed as that duration which is perceived as instantaneous (Arstila and Lloyd 2014; Power 2012): it sometimes indicates the lower bound instead of the upper one. This may be useful if, given a snapshot conception like Arstila, the upper bound has to coincide with the lower. However, for the sake of exposition, I propose to adhere to the conception of the specious present as ranging between the two, upper and lower, extremes.

Whilst it is still the dominant approach to the perception of t-events, the Specious Present Theory is more controversial to what it seems. Thus, it is worth to point out the main motivations behind its acceptance, as well as the puzzles it generates. The reasons in support are those we have just sketched: the solution of Kelly's Paradox, which implies making sense of *pheno-temporal realism,* by the full acceptance of the *immediacy thesis*. Versions of this argument are proposed among the others by Broad (1923) himself and Grush (2007). Here is a formulation by Prosser (2016):

> "P1: Motion can be detected only over a non-instantaneous interval
>
> P2: An instantaneous content cannot include anything that can only be detected over an interval
>
> P3: The content of experience includes motion
>
> C: Experience does not have instantaneous contents" (Prosser 2016: 121)

The connection with Kelly's paradox should be clear enough. The paradox of temporal experience arises because our alleged punctuated contents (P2) should not include t-events like motion (P3), because they require time to unfold (P1). Assuming that in this quote by Prosser (2016) "experience" is synonym with "perceptual experience", P3 configures itself as the acceptance of the *immediacy thesis.* The phenomenology of t-events is fully[51] captured by perceptual contents alone. The answer by the Specious Present theorist is thus to deny that contents are punctuated.

As simple as it may seem, this argument is all but uncontroversial. Neither the Resemblance Theory, nor the Memory Theories accept P3, *i.e.* they reject the *immediacy thesis*. Moreover, in rejecting just partially P3, meaning that *pure phenomenology* is still part of our perceptual experience, Dynamic Snapshot Theorists reject also P2 (cf. Prosser 2016: 121). The focus on P3, the immediacy thesis, is crucial. An argument *for* the immediacy thesis would support the Specious Present Doctrine and *viceversa* an argument against it would undermine the specious present.

Unfortunately, there is no argument in literature which supports the immediacy thesis, with the exception of some *phenomenological considerations* (Dainton 2000, 2018). In other words, there is no piece of literature in which the specious present is defended in a different way than reporting from introspection that we have perceptual experience of t-events. But this is again a statement about *pheno-temporal realism*, and thus that there is phenomenal contrast between receiving information about motion via our senses in respect that merely judging that motion has taken place (section 1.1 and 1.3)*.* Nobody in the dispute discards the idea that perception has a role in reaching *pheno-temporal realism*, thus these phenomenological considerations fall short to make a clear divide between specious present theories and deflationist models (chapter 2). The difference is whether it is possible to do it without assuming that only perception alone can do the work. And it is on this difference that the dividing line between deflationists models and specious present theories is drawn.

This is to say that P3 is not really motivated. So, the argument offered by Prosser stands *as long as* the deflationist models rejecting the immediacy thesis do not work. What I want to point out here is that the *Specious Present Doctrine* is ultimately

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[51] We have seen in 2.1.2 how Dynamic Snapshot Models restore partial of the phenomenology of t-events into perceptual acts.

accepted just as an inference to the best explanation, when the more intuitive deflationist models[52] are ruled out[53].

However, the Specious Present Doctrines are not immune to criticism. The most famous one is by Kelly (2005) who challenge the very idea of being *immediately aware* of durations. In order to have durations in our perceptual contents, one has to be presented with things in the past and things in the future. This means that we are literally presented with objects which are no longer there (the past), and object not existing yet (the future). This sounds as incredible if we think that intuitively we veridically perceive only the present: it seems that our perception is always misleading about the temporal location of what we perceive.

The import of this line of criticism is deeply connected with metaphysics of time (cf. Power 2012). To make a long story short, this point come to be problematic only if we have a conception of time ontology according to which only the present time is *real.* In this *presentist view* only things at a certain instant exist and thus we would be doomed to have false contents about future or past things[54]. Other theories of time admitting the existence of nonpresent things[55] may accommodate the full-blown veridicality of

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[52] Hoerl (2017b) does not agree with this claim. His diagnosis is that this intuitive appeal is just the fruit of a continuous misconception internal to the deflationist models, namely the constant oscillation between resemblance-like approaches and memory theories. I do not fully agree on the diagnosis. Indeed, I believe that the ultimate source of the intuitive appeal of deflationist models is the reaction to the paradoxical nature of the specious present, which presents objects occurring in the past (which are taken not to be around anymore) as well as things in the future (about to come). Hoerl (2017b) is right at underlining the difficulties of the deflationist models, which we assessed throughout chapter 2. Thus, the burden of proof against the specious present reverses.

[53] Prosser (2016) summarises some other reasons to accept the specious present. However, some are challenges to the deflationist models (namely its difficulties to capture temporal relations or nonvisual experiences). In this case the strategy of accepting the specious present because of the flaws of the deflationist models still stand. Other are based on phenomenological remarks, but we have seen at the beginning of the chapter why it would be better not to give a phenomenological reading to the specious present doctrine.

[54] You can see this point also in analogy with Time-Lag cases (Kelly 2005), namely those common cases in which we see a distant star that is no longer there. I think that the most natural reply for cases like this on the behalf of the presentist is to treat these cases as illusions (cf. Almäng 2014), given that there is no truthmaker that makes our perception of distant stars veridical. In analogy, also contents in the near future/past would result to be illusory within presentism. Finally, it is open to the presentist with the specious present inclinations to provide a theory of time-lag cases wihch makes our perceptions of distant stars veridical and argue that the same theory holds for the specious present. However, I do not see how to do it and I will not explore this possibility here.

[55] Growing Block and Moving Spotlight, which are along with Presentism the main A-theories. Power (2012) believes that this problem of experiencing durations affects the A-Theories in general but it is quite untrue: it is a problem only by assuming presentism.

the specious present: we are presented with such things as long as things at the present moment. Under a B-Theory, the order of explanation is even reversed: it is because we perceive a certain temporal segment of reality that that segment is present. If the specious present holds in an eternalist block of reality, then, contrary to what we have assumed so far, it is the present time to be extended (cf. Power 2012). Therefore, the first line of reply for a specious present theorist is to settle the metaphysics of time she prefers: by rejecting *presentism* she can hold its theory as it stands.

The second line of reply is to formulate the Specious Present Doctrine in a way compatible with all theories of time. This is usually done by assuming that the specious present spans over an interval which just *includes* the present moment: in such an interval some contents are perceived as *being-present*, others *as-past*, others *as-future*. Thus, tenses are exploited as different modes of presentation (Almäng 2014, see also Soteriou 2013: 94): in this case representing something which is no longer there or that it is about to come is not a problem anymore. We still have veridical perceptions of *non-present* contents[56].

To sum up, the objection based on perceiving durations does not pin down the specious present theory as long as we may either reject the only metaphysical view generating it or introduce temporal modes of presentation. However, there are costs for each move: a theory of t-events perception which is compatible with any position in metaphysics of time would be generally preferable to one which rejects one. On the other hand, introducing temporal modes of presentations would violate temporal transparency (section 4.5). Since I keep transparency, I would go for rejecting presentism. This would come not to be a surprise since, as it will be clear in chapter 5, I endorse an eternalist view of time and my task will be how to make sense of feel of flow of time in that perspective.

The second objection by Kelly (2005) is quite straightforward: how can we perceive events longer than the span of the specious present? This question is misplaced. As Hoerl (2013) points out, the specious present is all about *discrete* perceptions, which in our terms means "single acts of perception". In other words, the

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[56] Admittedly, I am unfair to Kelly (2005) since his objections to the specious present should better apply just on some forms of specious present, namely those which do not admit temporal modes of presentation.

specious present tells us the lengths of the events we may perceive just via a *single act of perception,* without the help of any other perceptual act. Thus, we may add, what Kelly is after is how these single acts compose in order to give rise to perceptions of longer events. This does not damage the *specious present* qua *specious present*: the deflationist models are also concerned with this. Indeed, there is an ambiguity in this question by Kelly that we should rule out. We encountered a similar point in section 1.5.3: this objection fails to distinguish between the problem of composing the stream from the problem of reaching diachronic unity in the single act of perception. In this respect it is not an objection to the specious present *qua* having phenomenology of t-events in perception, but it is a question on how single acts of perception compose in a stream able to guarantee the *continuity of the represented* (section 1.5.3). Both Retentionalism and Extensionalism have stories to tell about this and they will be soon assessed.

3.1.2 The Specious Present: some empirical findings

One natural question one may ask about the specious present is how long the interval it encompasses is. A hard question if it is true that temporal transparency does not make us able to discern the boundaries of the temporal field (Rashbrook-Cooper 2012). Thus, estimations based on introspective data should be discarded. Nevertheless, some empirical data have been interpreted to give estimations of the temporal depth of our acts of perception. The first thing to specify is that none of these estimations is meant to be granitic, indeed individual and environmental differences matter at determining the temporal length of the specious present of anyone.

Following Pöppel (1997), Wittmann (2016) and Gallagher (2011), we may make a distinction between the *narrative* timescale, the *integration* timescale and the *elementary timescale*[57]. The first one is above the specious present and it allows to estimate time (i.e. judging time over our perceptual capabilities) instead of perceiving it (Pöppel 1997). Our phenomenal awareness and the contents available to action are at the *integration timescale*, where information from all modalities about temporal

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[57] I borrow the labels by Gallagher (2011), which are very intuitive compared with the labels used by Wittmann (2016) and Pöppel (1997).

properties elaborated at the *elementary timescale* (which is occupied by the intrinsic rythms in neurons' discharge) are bound together in order to give rise to our perceptual experience of t-events. According to Wittmann it is at the integration timescale that we have the *sense of temporal present,* namely the specious present. This suggests that the upper bound has to lay in between the lower bound of the elementary timescale, and the upper limit of the narrative timescale. In APPENDIX3 there will be presented some upper bounds estimations. It is not clear whether they are effective.

The lower bound is the minimum amount of time required to perceive "before/after relation", *i.e* the minimal length of the specious present. It is differently estimated between 30ms (Pöppel 1997) and 300ms (Wittmann 2016), with Gallagher (2011) pointing at 100ms. This latter result is linked to the oscillatory Rhythm of neurones implementing the information sampling. The estimation of 30ms is linked to the coincidence threshold, since it is the interval over which we can discern the order of two stimuli in each modality. 300 ms is the interval allowing the order discrimination of four stimuli. Also Rick Grush (2005a, 2005b, 2007) converges on this estimation, by taking into account the time after which a stimulus start being elaborated and the amount of time before the action available to the system. In general, the lower bound is highly modal sensitive and it is sensitive to a high degree of variation. This should not be a surprise: the reason why the *integration window* is necessary is because different events, elaborated at different times need to be synchronised in a unified experience. For example, it is well known in TV industries that we are not able to discern the asynchrony between an audio track delayed up to 200ms in respect to a video sequence. As Durging and Sterberg (2002) claim in a picturesque fashion, it is better to have a specious present to integrate audiovisual information than "demons" responsible to the alignment of the "visual snapshots" with the "audio track".

Some empirical evidence can be seen as the main reason to reject the specious present doctrine. Arstila (2018) appeals to the findings by Di Lollo (1980) and Di Lollo and Wilson (1978) to make his point. In the simplest version, participants were asked to individuate the missing dot in a five-per-five matrix. The success depends the perceptual availability of all twenty-four dots. A "diachronic" version of this task present to the subjects two different matrixes in a sequence, containing twelve dots each. The

arrangement of the dots for each matrix was randomly chosen but, in each trial, the second matrix is complementary to the first one such as that no superimposition occurs. The result is that a missing dot is not represented in either of the two matrixes. The different trials differ only in regard of the amount of time of the first (leading) display is shown to the subject (10, 40, 80, 120, 160, 200 ms). Then an empty screen and the second display are shown. They both last 10 ms in every trial. The task was not so demanding up to 80ms. After 120 ms more than the 80% of wrong answers were given.

Thus, let us recap. There are two different scenarios to explain, one in which participants *succeed* at giving the right answer, and this is correlated with the length of the first stimulus. If it is shorter than 100ms, people succeed. The second scenario is when people *fail* to find the missing dots. Again, this is correlated with the length of the first stimulus. If it is longer than 100ms, people fail.

According to Arstila (following Di Lollo's own interpretation) this focus on the *onset* of the event is damaging for the specious present theories. In particular, each stimulus presented less than 100ms come to be "perceptually available" for 100ms in order to be identified. Thus, a 10ms-long stimulus is perceptually available for 100ms (90ms extra). Over 100ms there is no such "dilatation": the system simply keeps track of its presence as long as it unfolds. At 120ms the stimulus comes to be perceptually available for 120ms. Arstila maintains indeed that after the "identification threshold" there is no need for the system to retain the information about the first matrix, which disappears as soon as the white screen is presented.

In the 80ms session, the first stimulus comes to be dilatated in perception until 100ms and the success rate is preserved. Probably, the idea behind Arstila's remarks is that the dilatation of the first matrix is sufficient to make it superimpose the second matrix: after all if it is presented for 80ms plus 20ms (=100ms), this extra time covers the 10 ms interval between the two matrixes allowing the perceiver to see them both. This would explain *success* by Arstila's lights.

In trials presenting the first stimulus over 120ms this should not happen and, therefore, we have information loss of the first matrix (and the consequent decrease of succession rate) as soon as it stops being presented. This would explain *failures*: the first

matrix is not available together with the second one in order to give observers the chance to make the right judgments.

Here is the challenge to the specious present according to Arstila (2018): arguably a specious present theorist would explain success cases by saying that the two stimuli fall within the same specious present, and therefore they are both perceptually available to compare. However, given the experimental design, the two matrixes should be perceptually available in *each condition.* This because the specious present is meant to be longer than 10 ms[58] and therefore in each conditions information about the two stimuli must fall within the same specious present. Thus, people should always be able to compare them in order to find out which is the missing dot. Thus, the explanatory strategy for a specious present theorist explaining success is not able to explain failures!

What may a specious present theorist offer in alternative to this interpretation? The task for a specious present theorist is double: she has to provide a story compatible with the specious present for both the success and failure cases, in response to Arstila's challenge that only success cases can be addressed by the standard specious present, explanatory strategy.

Firstly, she may say that It is not clear that Di Lollo's perceptual "availability" has to be necessarily interpreted at the personal/conscious level. In this case, it is not a worry concerning the specious present theory, which is a theory of the perceptual content (Shardlow 2019). However, I concede that this is the case and therefore that the specious present theory is in trouble.

The general strategy by the specious present theorist is to deny that Arstila's is after the right way to explain successes within a specious present theory. Thus, also the specious present theorist can explain the difference between success and failure cases, by appealing to different mechanism as the snapshot theorist does. As Shardlow (2019) rightly suggests, the specious present theorists can allow to give the same answer than Arstila in respect of *successful tasks*: dilation may well happen within the specious present and give an answer of why people are successful in respect to trials in which the first matrix is presented up to 80ms. We can go along with Shardlow and assume that

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[58] Arstila (2018) brings about empirical reasons I won't discuss. I accept the point since it is coherent with the estimations we gave for the lower bound of the Specious Present.

the specious present theorist can agree with the deflationist theory that there is an extra mechanism that "artificially" dilates the first stimulus in the experience, if it is less than 100ms long in reality. This explains success at Di Lollo's task and we can leave it to psychologists to understand its nature.

Moreover, it is worth to point out that the admission of such a mechanism on Arstila's behalf is already the acceptance that explanatory machinery he poses for his theory (see section 2.2.2) is not sufficient for explaining success. This may be true also for the specious present theorist who appeals to the same mechanisms as the opponent. Success for stimuli of this sort cannot simply be a matter of having both stimuli within the same specious present. Some interesting consequences follow.

Firstly, this artificial dilatation of the stimulus makes it the case, counterintuitively, that success is a kind of illusory perception, while failures are not. Secondly, immediacy is preserved: if the specious present is accompanied with a naïve realist conception, then successes are not perceptual acts in the first place. So, it is even more reasonable to postulate such a mechanism to account for the illusion. If another theory of general perception is in place, the opposite may be true: such a mechanism can be part of our perceptual resources. In both cases immediacy holds.

Unfortunately, however, this is not the whole the story. Because the crucial point against the specious present doctrine is the idea that people can *fail* at recognising the dot when the perceptual availability of the stimulus is more than 100ms. This is the datum challenging the specious present, since it must be always the case that the second matrix has to be retained within the specious present along with the offset of the first matrix. In each trial there should be a moment in which both matrixes are available to in perception to be compared. My proposal is to deny that perceptual availability implies that we are able to compare the two matrixes.

The answer I am about to propose is very speculative, but it is necessary to be in my position since the only way out is to provide an alternative explanation for Di Lollo's (1980) and Di Lollo and Wilson's (1978) findings. Let us begin with an analogy, let us contrast the specious present with the visual field: both present us with *regions,* either of space (the visual field), and of time (the specious present). Nobody denies that there is something like "the visual field": there are also clinical exams that rely on it in order

to detect diseases like glaucoma. We tend to report that the information about colours and other details are uniform throughout the visual field. Thus, intuitively a colour source at the periphery should be there to be compared with a colour source near to the focal centre. However, these are false judgments. Dennett (1991) proposes a "do-it-to-yourself" experiment:

> The visual field seems to naïve reflection to be uniformly detailed and focused from the center out to the boundaries, but a simple experiment shows that this is not so. Take a deck of playing cards and remove a card face down, so that you do not yet know which it is. Hold it out at the left or right periphery of your visual field and turn its face to you, being careful to keep looking straight ahead (pick a target spot and keep looking right at it). You will find that you cannot tell even if it is red or black or a face card […] You will probably be surprised at how close to center you can move the card and still be unable to identify it. (Dennett 1991: 53-54)

There are two possible interpretations of this passage. The first one is Dennett's own, according to which our phenomenology is simply mistaken, since our visual field contains much less information of what it *appears* to us. The second one is that appearances are true, but we cannot correctly report what is at the periphery of the visual field (Alsmith 2012). Therefore, in both interpretations, subject cannot report details of the card, either because our phenomenology is poorer than it seems or because of some post-hoc cognitive defect in reporting judgments. Plausibly, the fact that, at the minimum, we are not able to report the details of the card in the periphery, makes us unable to make verbal contrastive judgments between the card in the periphery and another card that we can put in the centre of the visual field.

Now the analogy with my answer to Di Lollo's findings should be clear enough. Arstila (2018) clearly works under the assumption that if two bits of information fall within the same specious present then they are available to comparison. And a comparison is required to figure out the missing dot between the two matrixes. Since the comparison cannot be made, Arstila goes, then there cannot be a specious

present[59]. My challenge is indeed direct to this very assumption: the fact that two bits of information fall within the same specious present (*i.e.* perceptually available) does not necessarily imply that they are available for comparison. I propose to split up the explanation of the succession and the failure cases in the same way as the snapshot theorist does. Success are explained by the very same overlap-generating mechanism. Failures are explained by information loss. This can be done either because our temporal phenomenology is poorer that what we take it to be (cf. Durgin and Sterberg 2002), or because we are unable to report after having the experience. However, none of this implies the absence of a specious present, exactly in the same way in which the difficulties at figuring out details about the card at the periphery of the visual field does not imply the denial of the visual field. At the best, Di Lollo's findings show the interesting results that this inability to report within the specious present starts very soon after the present moment, giving us information about how the specious present is configured.

In this section we have spelt in some detail the doctrine of the specious present, which is at the base of the two most popular theories of t-events perception, namely Retentionaism and Extensionalism. The latter will be the main topic of the next section.

3.2 The Extensionalist Theory

At the bare minimum Extensionalism tries to answer to the Paradox of Temporal Experience by making the following two claims:

1) The contents of our experiences are temporally extended
2) The temporal extension of the vheicle is isomorphic to the extension of its content

Claim 1) is the admission of a specious present. Every act carries temporal information broader than an instant. Our perception presents us with contents spanning over an interval, thus it can allow for the representation of t-events in the way envisaged by a

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[59] Unfortunately, neither Di Lollo (1980) nor Di Lollo and Wilson (1978) provide a transcript of the phenomenological reports by the participants.

Specious Present Theory. Change, Movement and Persistence figures in our phenomenology since different temporal parts of t-events are all presented to the extended vehicle of perception. That is to say, the *relational principle* (sections 1.1 and 2.1)*,* according to which both *relata* have to be presented in the same content, in order for a relation to be perceived is fully satisfied: extended vehicles of perceptions make it possible to perceive temporal relations, like succession, order, duration and simultaneity.

Claim 2) is the distinguishing feature of Extensionalism in respect to Retentionalism. It is the idea that the perceptions themselves are temporally extended, in an isomorphic way, in respect to the content. This result is the direct upshot of the acceptance of *Metrical Mirroring,* namely the idea that 1) both content and vehicles are composed by parts, 2) there is one-to-one correspondence between parts of the content and parts of vehicles (*Structural Mirroring*) 3) the order and duration of each content part matches the order and duration of each experiential part (PPC and *Topological Mirroring* respectively) (section 1.7.2).

Let us put these pieces together with an example: I see the sunset sky changing from light blue to orange to dark blue. All this process lasts for a certain amount of time *dt*. Simplifying a bit, it is composed by three phases: the sky's being blue (*e1*), the sky's being orange (*e2*) and the sky's being dark blue (*e3*). Let us assume they lasted *dt1, dt2, dt3* respectively. According to the extensionalist account. My overall experience lasts *dt,* which is the sum of the durations *dt1,dt2,dt3*. It is composed by phases that follow the same order those of the process: *e1-e2-e3*. I Indeed perceive the sky's being light blue first, then I undergo the perception of the sky's being orange and finally I perceive the sky's being dark blue [*fig.3*].

dt1 dt2 dt3

Overall
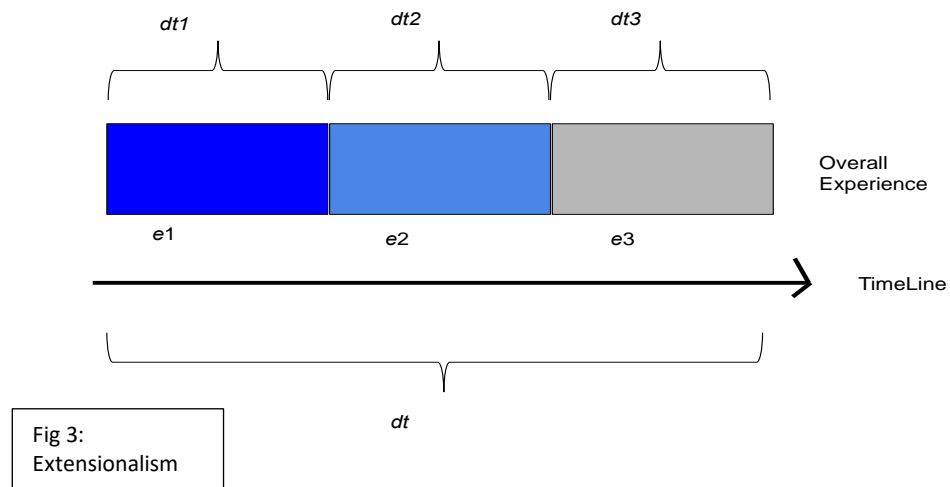Experience

e1 e2 e3

TimeLine

dt

Fig 3:
Extensionalism

The core of the Extensionalist proposal is the idea that whilst a succession of sensory experiences is not *sufficient* for an experience of succession, it is still *necessary* (Hoerl 2013; Rashbrook-Cooper 2013). Pheno-Temporal Realism is achieved by the assumption that perceptual experience has to be sequential in character in order to deliver the correct phenomenology of t-events. As far as I can see, this line of thought is ultimately the upshot of taking perceptions to *unfold* parallel to the t-events we perceive. With an analogy, perceptions are like download-bars extending in time along with the download of the "content-data". This intuition pushes the extensionalist toward the idea that the phenomenology of t-events has to be explained by this parallel between the temporal properties of the act (order, succession, duration and simultaneity) and those of the t-event under issue[60]. Of course, this leads to the question of how *diachronic unity* is reached, given that phenomenal unity seems not to be possible since the *Principle of Simultaneous Awareness* is not available for extensionalists (see section 1.6 and 1.7).

The various Mirroring principles behind the Extensionalist theory are undoubtedly elegant and intuitive. Indeed, when asked to report how long a perceptual experience lasts, it seems quite natural in the latter example to state that our perception

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[60] In particular, Rashbrook-Cooper (2013) expresses this point by assuming that metaphysical PPC is the best explanation of phenomenological PPC (section 1.7.1), which by his lights is a component of the phenomenology of t-events Extensionalism has to explain.

of the sunset lasts as long as the sunset lasts. Moreover, we may report that our perception of the sunset's light blue sky comes before the perception of the dark blue sky. Moreover, the idea to distributing contents over extended acts of perception puts Extensionalism in an enviable position in respect to accounting for sensory experiences longer than the specious present. According to the Extensionalist, our acts of perceptions literally unfold over time in order to encompass different contents: it is the same way in which we intuitively think about the *stream of consciousness.* Indeed, it seems quite easy to think about the flowing character of our stream of consciousness as a process, composed by these *unfolding parts.* So, Extensionalism seems to kill two birds with one stone. On the one hand, it explains why we undergo the phenomenology of t-events, by telling us that we are presented with extended contents. The appeal to Metrical Mirroring makes the extended acts able to account for the phenomenology of temporal relations like duration, order, succession and simultaneity. On the other hand, it can explain the perceptions of changes longer than the specious present, in virtue of this privileged position in respect of the continuity of the stream (although with differences among the various extensionalist options)[61].

Finally, a clarification has to be made: as we saw in sections 1.2 and 1.7, Metrical Mirroring is a principle relating the perceptual conscious experiences to their parts. In this sense it is not straightforwardly coincident with the BrainTime View (section 1.2), which makes a correspondence between the temporal properties of the vehicle and the time of contents[62]. Both the BrainTime View and Extensionalism (given the acceptance of Metrical Mirroring) are *Time as its Own Representation (TOR)* views[63]. They come to be coincident only if one between the temporal correlational principle or the temporal identity principle is in play. These, I recall are the principles connecting the time of the

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[61] Indeed, it is not a case that the majority of extensionalist-oriented people, for example Rashbrook-Cooper (2011) and Soteriou (2007, 2013), are primarily interested in developing an account of the continuity of the stream. In the same vein, it is worth to point out that the Dainton's (2000) book originating the debate about the perception of t-events is named "*Stream of Consciousness. Unity and Continuity in Conscious Experience".*

[62] The difference is echoed in the TOR-c (conscious) vs TOR-u (unconscious) distinction by Arstila and Kiverstein (2013).

[63] In their 2013 paper Kiverstein and Arstila interpret Chuard's Resemblance Theory as not being a TOR view, since it denies that single acts have a temporal structure. Arstila would change his mind in his later papers (2016a, 2017).

perceptual experience to the time of the vehicles[64]. In dealing with Extensionalism, I will still adhere to the physicalistic idea that the time of the act of the sensory experience is or is rightly correlated to the time of the vehicle. I will be explicit in which case the two falls apart and Metrical Mirroring comes to be detached from the BrainTime View.

These are the core ideas with which every extensionalist may agree. However, there are still some issues with this characterisation that should be spelled out. The first issue concerns the claim that every extensionalist is committed to *Metrical Mirroring* (section 3.2.1)*.* The second one is about the main extensionalist concern, namely how *diachronic unity* is reached within a single act of experience, given that contents are distributed over time. This problem is closely linked to the way in which Extensionalism is supposed to differ from the Resemblance Theory: if ultimately perceptions are composed by parts realising parts of the contents, the collapse into the Resemblance Theory seems just one step further (section 3.2.2). Different answers to this question would illuminate two broad conceptions of Extensionalism: the *Overlap Model* (Dainton 2000; 2002; 2008; 2014b; 2014a; 2018) (section 3.2.3) and the *Naïve View* (Phillips 2010, 2014a, 2014b, 2014c; Rashbrook-Cooper 2013; 2016; 2017; Hoerl 2013; 2017a; Soteriou 2007; 2013)(section 3.2.4)*.*

As before, I will proceed as follows: I will formulate the best Extensionalist options on the table in order to assess their virtues and flaws. Then I will discuss the problems according to which the Extensionalist theory should be finally discarded.

3.2.1 Extensionalism: PPC and the Mirror intuition

The first clarification is about the way in which Extensionalists frame their position. We have said in chapter 1 how, following I. Miller (1984), it is commonly assumed that Extensionalism holds the *Principle of Presentational Concurrence* PPC, contra Retentionalism, which endorses PSA, *the Principle of Simultaneous Awareness* (section 1.6).

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[64] I recommend the reader to notice that in discussing Arstila's proposal in section 2.2.2, we encountered the thesis of *temporal isomorphism*, which connects broadly mirror constraints to the time of the acts.

It is a true claim that can be found in many extensionalist authors trying to characterise their position, like Rashbrook-Cooper (2013) and Soteriou (2013). For example, Rashbrook-Cooper (2013) assumes that metaphysical PPC, namely the idea that our perception has itself a significant duration, ultimately explains why we perceive temporally extended items. However, as we saw in section 1.6, there is no implication from metaphysical PPC to Metrical Mirroring, since the implication works on the other way. The reason is because PPC, which is a claim about duration of the act, may be logically detachable from *Topological Mirroring,* the idea that the order of the perceptual vehicles follows the order of contents. However, it would be very weird to endorse a theory allowing for the visual experience of the sky's change in which the transition from orange to dark blue precedes the change from light blue to orange. A reversed phenomenology of this sort would be really awkward and very unhelpful form an evolutionary point of view, assuming that perception be a reliable guidance for our actions in the world. Thus, given these trivial remarks, the fairest characterisation of the Extensionalism is the position accepting *Metrical Mirroring*: a criticism invalidating Metrical Mirroring would invalidate Extensionalism.

It is worth to point out that the example of the sky's change has been taken to be deliberately long, in order to give an example of a visual experience outstripping the length of a single specious present. The idea here is that the same Metrical Mirroring applies also at the level of the *stream:* the *continuity of the represented* of a long visual experiece is guaranteed by the idea that the extensional acts of perception compose themselves in a longer stream, of which they are part. The composition obeys to Metrical Mirroring: a 5 minutes long visual experience of a football action in which there are continuous turnarounds, lasts 5 minutes and the internal parts are organised as to follow the order of the various actions of the two teams. This last suggestion leads us to another point to clarify here, namely how Extensionalism should not collapse into the Resemblance Theory we encountered in section 2.2.

3.2.2 Extensionalism and The Resemblance Theory: accounting for Diachronic Unity

The similarity between Extensionalism and the Resemblance Theory is mainly due to their acceptance of the Metrical Mirroring at the level of the stream. Also, a resemblance theorist would agree that, for example in seeing a football game, our

perceptual stream is 90 minutes long and follows the order in which the various actions develop. However, as we have seen in section 2.2.1, the resemblance theorist claims also that the stream ultimately boils down into disconnected short-living perceptions, while the extensionalist insists that also experental parts have to be extended.

However, so stated, this distinction cannot be satisfying. As Hoerl (2017a) points out, there are versions of extensionalism, like the *Pulse Theory* (Sprigge 1984), according to which our stream is made by discrete blocks of perception succeeding one over another, presumably with small gaps in between. Both the Resemblance and the Pulse Theory work on the assumption that there is similarity between the order of the perceptual phases and of the content phases. At this point is easy to have a regress according to which the parts of the perceptual acts are made up by subparts, until reaching the minimal short-living perceptual acts required by the resemblance theorist.

To avoid the regress is sufficient to give an account of how the single acts of perception in a Pulse Theory meet the *relational constraint* (sections 1.1, 2.1), which is rejected by the resemblance theorist. This leads to the obvious problem of how reaching diachronic unity. And it is a particularly pressing point since the *Principle of Simultaneous Awareness* does not hold for Extensionalism (in opposition to what the Resemblance Theory claims)[65]. Here is where we can draw the main divide in the extensionalist camp: the one between the *Overlap Model* (Dainton 2000; 2008b; 2014b; 2014a; 2018) and *The Naïve View* (Ian Phillips 2010; 2014a; 2014b; 2014c; Hoerl 2013; 2017a; Rashbrook-Cooper 2013; 2016; 2017; Soteriou 2007; 2013). To make a long story short, these two interpretations of Extensionalism diverge exactly on how to make sense of diachronic unity.

3.2.3 The Overlap Model:

The Overlap Model is linked to the name of Barry Dainton (2000, 2008, 2014a, 2014b, 2018). He explains his model starting from the *Pulse Theory* (section 3.2.2), and

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[65] Indeed, we are again adhering to the classification I suggested troughtout the dissertation, according to which Deflationist models accept both PSA and Metrical Mirroring, Extensionalists reject the former and accept the latter, Retentionalism accept PSA and reject Metrical mirroring. The ask for diachronic unity for the Extensionalist is just another way to cash out the idea that Extensionalist do not accept PSA, while the Resemblance Theory do. Indeed, the lack of diachronic unity is the upshot of the acceptance of both intuitions.

by making the observation that, if within each block there is perceived continuity (continuity of the represented), the same cannot be true for adjacent contents in different blocks. Thus, let us say that we are undergoing an auditory experience of an ascending scale: C-D-E-F, and, for sake of simplicity let us assume that the first block contains C-D while the second E-F (fig.4).

$e1$ $e2$

C	D	E	F
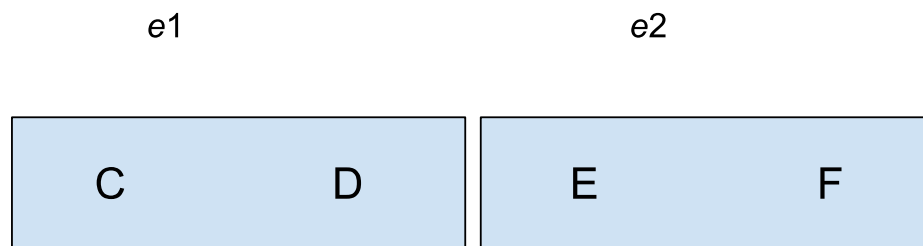
Fig.4 Pulse Theory

The driving idea by Dainton is the observation that in the first act we may perceive the content D following the content C, and the same happens in the second act of perception with contents E and F. However, because by hypothesis we are listening to the unfolding of a scale with no significant interruption, there has to be continuity of the represented even in between D and E, a felt continuity that seems to be broken down due to the gap between the two acts of perception. The proposal by Dainton is simply to fill the gap: there is a third act of perception encompassing both D and E, which guarantees, by using Dainton's terms, the "flowing of D into E" (fig.5). This is the Overlap Feature giving the name to Dainton's theory.
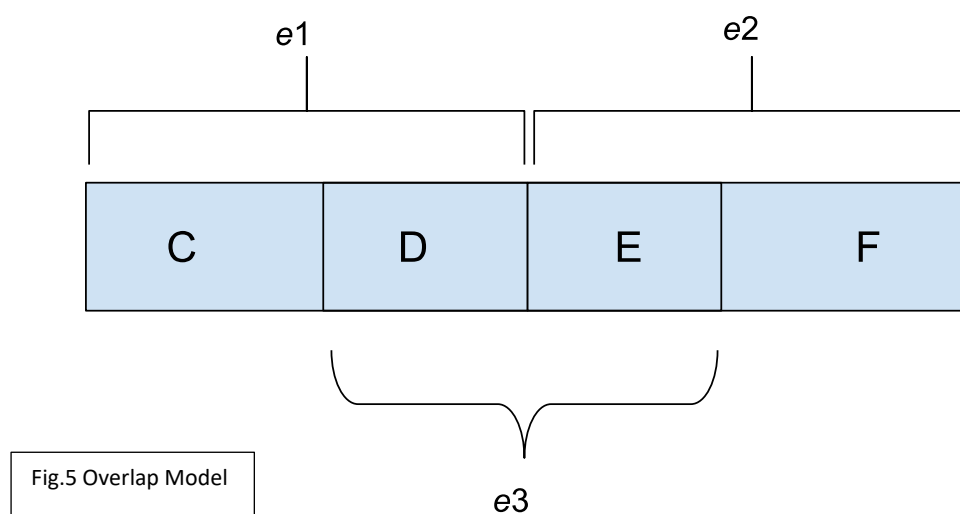
Fig.5 Overlap Model

Within the Overlap Model, the Mirroring principles are interpreted as being implemented by an *Experiential Part Strategy* (section 1.5.2). Each acts of perception present different contents over time, following the usual isomorphism between parts of the content and parts of the act recommended by Metrical Mirroring. However, each briefer perceptual part is a *full-blown act of perception* according to this model, which is again made up by briefer perceptual parts that are made up by briefer perceptual parts and so on and so forth. Thus, at the bottom it seems we have momentary acts of perception. Morever, it is a crucial part of the theory the idea that these briefer perceptual parts come to be shared by the adjacent, overlapping, extended acts. As a result, the briefer parts falling within different acts are numerically identical, in the same way in which two different houses may share the numerically identical garden.

There is an important reason why Dainton chooses to elaborate this model this way. It is linked to the challenges he poses to Retentionalism (the Stuttering, the Ballooning and the Surplus content problems), which we will see in detail in section 3.3.1 and 4.6.3. The common features of these problems is that the subject is presented with a distorted phenomenology. This because retentional acts in the retentional stream present the subject with "more content" than what they should. I postpone the details. Here it is sufficient to notice that much of the difficulties arise from the facts that different acts present the same contents, involving a repetition of these contents. The

sharing of numerically identical perceptual parts avoids these problems. With an analogy: if two close houses share the same garden, the garden is not doubled. In the same way if two overlapping acts share the same experiential part, that part is not doubled and neither it is the content (We will see later on why, Retentionalism is committed to such a duplication according to Dainton).

Please notice, this is the most metaphysically parsimonious way to construct the position: denying that this is the "bottom" of the Overlap Theory comes to be metaphysically more demanding, as we are about to see in a while. Moreover, as we hinted in the previous sections, this makes the Overlap Theory close to fall down onto the Resemblance Theory.

The solution by Dainton (2000, 2008, 2014a, 2014b, 2018) is to postulate a peculiar relation, *co-consciousness* to characterise the phenomenal unity among contents at different times. According to Dainton, co-consciousness is a primitive, irreducible, and inexplicable relation that binds together different perceptual experiences in a single one. The intuitive analogy is with synchronic unity: I undergo a single act of visual perception. I see the silver surface of my laptop and the blue of the screen, these are *co-conscious* since they are both present to the single act of perception. Dainton (2000) maintains that the same works for diachronic unity: different parts of an unfolding t-events are *co-consciously* given in the same single act of stretched sensory experience.

The appeal to co-consciousness makes the Overlap Model interesting for several respects. The first point is that, the Overlap Model has co-consciousness as a characterisation of diachronic unity. The very presence of this relation tracks a clear difference between the Overlap Model and the Resemblance or Pulse Theories.

Secondly, since co-consciousness characterises the unity of contents over time, its extension determines the extension of both the single act of perception and the maximal span of the *specious present*. Diachronically co-conscious contents follow within the same specious present, while contents that are not so related do not fall within the same specious present.

Finally, the co-consciousness is what constitutes the overlaps: between *any two* adjacent acts of perception, there is a third act made up by co-conscious contents overlapping the previous two. As co-consciousness is able to unify contents within a

single act of perception (diachronic unity), the overlapping structure derived from co-consciousness gives us the *unification of the stream,* able to capture the continuity of the represented for longer periods. The resulting structure is the following (fig.6):

TimeLine

Fig. 6 The Overlap Steam.

(The acts have been separated for reasons of clarity. They do overlap indeed.)
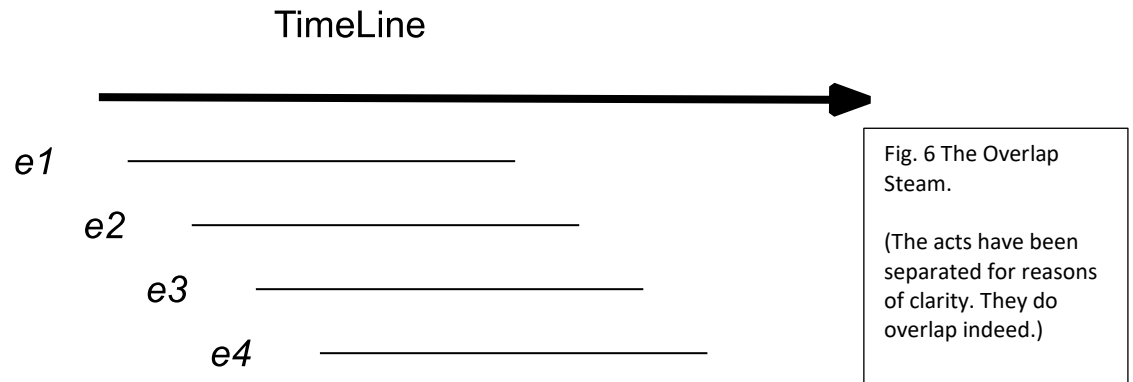
The final remark to make is that Berry Dainton (2000) explicitly rejects representationalism for a *Sense-Datum* theory of perception. I do not believe that this feature is necessary for the Overlap-Model, whose description I provided can be accepted by theorists with any inclination about general Perception. It has been suggested to me[66] that the Overlap Model equipped with Sense-Data can accommodate Allport's (1968) view of a "travelling-psychological moment", namely the idea of a continuous perceptual vindow in a continuous stream (in opposition to the view that perceptual experience undergoes discrete sampling). I will not evaluate this statement, but I just point out that, along with this advantage, coupling the the Overlap Model with Sense Data brings about all the problems notoriously affecting *Sense Data* (Cf Crane and French 2017 for a review).

Dainton's theory is tailor made to account for the *desiderata* he poses: *Pheno-temporal realism, the immediacy thesis, diachronic unity* and *the continuity of the stream* (section 1.2.1). However, as it should be clear from the discussion in chapter 1, this is a kind of Pyrrhic victory. Pheno-Temporal Realism is accepted by all the theories in play, since achieving it is just another name to say that the Paradox of Temporal Experience has been solved (section 1.4). The immediacy thesis loses its strength once it is decoupled by the rejection of temporal modes of presentation and, as we have

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[66] Many thanks to Vallteri Arstila for this point.

interpreted it, it is just a way to admit the specious present. In this respect it is just a strategy to reach Pheno-Temporal realism, it is not a virtue (section 1.8). Let us discuss the other two.

As we see in a while partially rehearsing our discussion in section 1.5, the two issues are connected. The heart of the Overlap Model is the relation of co-consciousness which is in charge to provide both *diachronic unity* and the account of *the continuity of the stream* Dainton his after. However, the two things should be kept separate. To make things even more complicated, there is the problem that both diachronic unity and the continuity of the steam may have a double reading.

Here is a recap of section 1.5: *diachronic unity* is ultimately a *phenomenological issue,* according to which successive contents are presented to a single act of perception. However, there are different metaphysical strategies to reach it, and the Experiential Part Strategy by Dainton is one of them. *The modest continuity of the stream* can be just a *phenomenological claim* (subjective continuity) or a metaphysical claim (objective continuity) (Section 1.5). The continuity of *the represented* is a phenomenological claim: it is the idea that a certain t-event is not perceived as being composed by discrete phases. In what follows, I will assess how co-consciousness is related to the issue of the continuity of the stream and diachronic unity respectively[67].

As we know, the Overlap Model ultimately aims to reach a notion of continuity which is not among the one I have just presented. Indeed, the Overlap Model is designed to reach the *strong continuity* of the stream (section 1.5.3), namely the idea that there are experiential connections among the various streamal phases. As we said in Chapter 1, this is a claim that needs disambiguation. Here the formulation by Dainton (2014a:125) of Strong Continuity:

> "**Strong continuity**: A stream of consciousness is strongly continuous over an interval if each of its briefer phases is experienced as flowing into the next. (Dainton 2014a: 125)"

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[67] It is not surprise that the tension between a metaphysical reading of Diachronic Unity and a phenomenological one is in place: this echoes the considerations we made in section 3.1 about the various readings of the Specious Present.

According to Dainton (2014a, 2018) Retentionalism does not accommodate Strong Continuity, even if the Retentionalist stream of consciousness may be composed by a continuous series of momentary experiences. This because "*Strong Continuity Requires a good deal more: real experiential or phenomenal connection between neighbouring stream-phases* (Dainton 2018)". Here is all Dainton's ambiguity: Strong Continuity oscillates between being a metaphysical (regarding *real* experiential connection) and a phenomenological claim (regarding phenomenal connections). Moreover, as we saw in section 1.5, it is not clear whether it is a claim about the *continuity of the represented,* or a claim about the stream itself.

If Strong Continuity is a phenomenological claim about the continuity of the represented, then also Retentionalism has it: it boils down onto be just the idea that adjacent specious presents share part of their content (section 3.3.1). Even Deflationist Models have it, since, as we noticed in section 2.2.1, like in a film, gaps are too short to be noticed, resulting for the experience of a continuous t-events. In this case, we may have a discontinuous stream of experience representing a continuous t-event.

If Strong Continuity is a claim about the stream than, given Dainton's formulation, it is transparency violating. Regardless of whether the stream really is continuous, it is still a property attributed to the stream that is introspectively available. This concern is even amplified by noticing that Dainton (2014b) endorses a *Sense Data* theory of perception, which is traditionally considered at odds with transparency.

Finally, if Strong Continuity is a metaphysical claim about the stream, it runs against the various empirical findings we encountered throughout the dissertation, namely the *saccade suppression* (section 1.5.3), the *wagon wheel illusion* (2.1.1) and the various remarks over the oscillatory neural periods (2.1.1). These seem to be naturally interpreted in the opposite way, as supporting the idea that our visual perception works with a *discrete pace*. This suggests that, quoting Holcombe (2014), there are cracks on the "apparently" continuous façade of the visual perception. Of course, there is still margin for a dispute here[68]. However, as long as the discontinuous interpretation is

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[68] Indeed, as Valtteri Arstila points out to me, it may be the case that Allport (1968) is right and we have a travelling psychological momentum requiring that the stream is really continous.). I agree with Arstila on the fact that Dainton's is the best theory to make sense of Allport's view, but I am not completely sure

open (and it is indeed popular among psychologists), it would be better not to rule it out, by assuming that the stream *is* completely gapless. Assuming that we simply take it to be so would be safer in this respect.

Thus, the upshot of this discussion is simply that the Overlap Model is designed to account for Strong Continuity, but then one of the two: either the latter boils down into the continuity of the represented, and this gives no substantial advantage to the Overlap Model over the competitors; or it is a claim about the stream. In this latter case the Overlap Model comes to be transparency violating and, in the worst case, may run against some well-established empirical findings.

Of course, an Overlap Theorist different from Dainton may join us at denying that Strong Continuity is a good achievement and show that, ultimately, the Overlap Model may be constructed in a way ignoring the bad outcomes of the admission of strong continuity. This pushes us to look closer at the Overlap Model indeed.

The first point to clarify is the relation between co-consciousness and the overlap structure. Co-consciousness represents the maximal length of the specious present. And given the acceptance of the mirroring principles, it reflects the length of the single act of perception. By departing from the *Pulse Theory,* the Overlap Theorist assumes that the contents within each pulse has to be co-conscious (like in the Pulse Theory), but there must be also co-conscious acts overlapping the pulses (unlike the Pulse Theory). These make contents belonging to different pulses co-conscious as well. Now, what is difficult to assess, once again, is the *metaphysical import* of these claims. One may assume that the overlapping acts bring about the actual unification of the *pulses* in a continuous stream (let's call it MET-Co-Consciousness). In alternative, one may simply state that co-consciousness represents a specious present connecting two *pulses,* by having phenomenological diachronic unity between the two, with no unification of the acts in an extended continuum (NonMET- Co-Consciousness). Of course, MET-Co-

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that the other specious present theories cannot make sense of it. A retentional stream can be gapless (as described by Dainton 2014b himself), meaning that at each instant there is a specious-present window open (rather than an ongoing snapshot-like window). The Naive View as well can easily accommodate a continuous stream and an always going-on window. The important point here is that, while the Naive view and Retentionalism can be open on whether the travelling momentum is true or not (since they can admitt a discontinuous stream), the Overlap Model is not.

Consciousness brings about the obvious concern that it is better to leave open the possibility of a discontinuous stream of consciousness for the reasons given above.

NonMET Co-Consciousness is less compromised, but equally puzzling. It relies on the observation that eventual gaps between the pulses would not be noticed (section 1.4). However, one may ask what co-consciousness adds to the explanatory machinery of the *Pulse Theory*. By admitting that gaps between pulses would not have been noticed, the overlap theorist is already assuming that both the continuity of the represented and subjective continuity hold, regardless of the objective continuity of the stream. But then, why one has to bother at assuming *overlaps*, given that the phenomenology of t-events is already delivered by the explanatory machinery of the pulse theory. Under this respect Phillips (2010: 189) is right at complaining that overlaps seem like "*unwholesome food served to a man already full*". If the kind of continuity the Overlap Theorist is after is the *continuity of the represented* and/or *subjective continuity,* then co-consciousness is *redundant* (Rashbrook-Cooper 2012).Things would be different if the Overlap Theorist is after *something more,* namely the idea that it is the objective continuity of the stream that *explains* both *subjective continuity* and *the continuity of represented.* This would surely require overlaps between pulses and a MET-Co-Consciouness. But again, we have seen that is unwise to accept it.

Another point concerns co-consciousness and diachronic unity. As we will see many of the observations we have just made will come back, given the undue conflation of issues relating diachronic unity and continuity. Co-consciousness is clearly meant to provide a way to diachronically unify non-simultaneous contents. However, co-consciousness seems just a way to describe what is for contents to be part of the same specious present, more than an explanation of *how* different contents are bound together. Of course, this does not affect Dainton, who repeatedly insists that this relation has to be understood as being *primitive, irreducible and inexplicable.* A rejoinder that, as we are about to see, it is all but satisfying.

A second observation is that *co-consciousness* is the only thing standing in between the Overlap Model and the Resemblance Theory. The threat is of course based on the fact that both the Resemblance Theory and the Overlap Model assume *Metrical*

Mirroring as part of the explanatory machinery of the phenomenology of t-events. As Chuard (2011) points out, the idea of having experiential parts within the act of perception brings about the suggestion that the *phenomenology* of t-events has to be *reducible to the phenomenology of these parts.* In the end it seems that the most natural way to interpret the role of an Experiential Parts Strategy at solving Kelly's Paradox is to think about an explanatory role played by the resemblance between the temporal properties of experiential parts and the order of content parts (i.e. duration,order, succession and simultaneity). At this point one should ask what co-consciousness may add to the explanatory resources of the Resemblance Theorist (section 2.2.1). Probably Chuard is too harsh with his conclusion, since co-consciousness is meant to give us a specious present where there would be none (i.e. to accept the immediacy thesis)[69]. But there is still something correct: we accepted the specious present because the alternative, the deflationist models, ultimately fail. Thus, once again, it seems quite *ad hoc* to postulate co-consciousness to accommodate the specious present, even though the explanatory resources of the Overlap-Model are the same of the "failing" deflationist model.

This charge gets concrete if we think that co-consciousness has no other echoes in any account of the mind. Firstly, the analogy with synchronic co-consciousness falls down at this point: while it may be obvious that properties falling within the same synchronic content are co-conscious, the same is not straightforward for diachronic co-consciousness. The intuitive appeal of co-consciousness at the synchronic level seems to be (at least partially) given by the idea that that contents are *simultaneously* presented to the single perceptual act, *i.e.* because of PSA. As Phillips (2010) maintains, Dainton's characterisation of diachronic co-consciousness seems nothing over and above a brute denial of PSA.

Secondly, given temporal transparency, what our introspection tells us is, at the best, that the content is unified. It tells nothing about whether the acts are unified[70]. Thus, at the best, introspection can tell us that nonMET Coconsciousness holds. If acts

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[69] It is no surprise since Chuard (2011, 2017) rejects the specious present.
[70] I believe that the naïve realist at this point may translate this claim in a different way. Given transparency, nothing tells us that our perceptual experience *is experienced* as unified. This makes it clear the charge of a collapse of the extended acts over short-living ones.

are not unified, then, on one hand we are closer to the pulse theory and to the resemblance view, given that eventual gaps are unnoticed. This, again, makes co-consciousness useless.

Thirdly, as admitted by Dainton (2000) himself, diachronic co-consciousness must be intransitive. Given the general structure of the Overlap Theory, if content A is co-conscious with content B, and the latter is co-conscious with content C, it does not follow that content A is co-conscious with content C. Otherwise, all contents would be part of the same specious present and we would be aware of all the stream at once. A result I find unpalatable. Synchronic co-consciousness, on the other hand has to be transitive, since it is trivial to say that, if I perceive the silver of the surface of my laptop along with the blue of the screen, and I perceive the blue of the screen along with my hands on the keyboard, then I have got one perceptual experience encompassing both the silver surface, the blue screen and my hands on the keyboard. It is not surprising after all: at the synchronic level contents are given *simultaneously* to the perceptual act, and simultaneity is a transitive relation. This does not happen at the diachronic level. Following remarks along these lines, it is easy for us to conclude along with Rashbrook-Cooper (2011) that the two kinds of co-consciousness cannot be the same relation. And the *ad hoc* charge in front of the treat of collapse into the Resemblance Theories comes to be more concrete.

A line of reply by Dainton (2000) that puts his position on a better ground in respect to the treat of collapse can be found in his formulation of the doctrine of *Subjective Dynamism*[71]. It is the idea that there is an intrinsic and irreducible dynamic character in each conscious experience. Thus, also the briefest one has to present us something that has the structure of "something after something else"[72]. If this doctrine were correct, it would save Dainton from both the treat to collapse and the *ad hoc* charge: there is a way in which the resemblance theory cannot be viable, because of its

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[71] The name is given after Pelczar (2010a).

[72] The disambiguation of this doctrine would require a chapter on his own. Both Dainton and Pelczar seem to agree upon the idea that our perceptual acts always present us with "something following something else". Indeed, they clearly include persistence as opposed to motion. Moreover, as we will see in chapter 5, Subjective Dynamism also includes a sort of dynamic *quale* not completely reducible to cross-temporal relations. I will postpone the discussion of this latter idea, and now we will just take subjective dynamism to refer to the idea that every act of perception presents cross-temporal relations.

clear incompatibility with the Subjective Dynamism. In this view, co-consciousness would characterise the fact that each perception contains diachronic relations, and, *ipso facto*, extended in content. Perception has to contain the various phases of the t-event giving rise to this dynamism[73].

However, as both Pelczar (2010a) and Dainton himself (2014a) point out, this is not helpful. In Dainton's models the single acts of perceptions are themselves composed by briefer experiential parts, which are perceptual experiences themselves. Given the continuity of these, it follows that an instantaneous bit of content is associated to each point in time. However, since the overlap model is committed to explain how the diachronic character of our content arises from the composition of these brief perceptual experiences, it cannot be the case that these are ultimately diachronic, otherwise it would be circular. At this point the Overlap Theorist has to bite the bullet and assume that the diachronic character in content *is reduced* to the instantaneous character of the snapshots. But this move is incompatible with the very doctrine of Subjective Dynamism: such conscious experiences are impossible by definition. Thus, they cannot be the bricks of the extensional stream and, therefore, we cannot have the extensional stream in the first place. To sum up, *Subjective Dynamism* puts the Overlap Theorist in front of dilemma, either the theory is circular or impossible.

To pass through the horns, the response by Dainton (2014a) is to pose *extended* phenomenal atoms at the base of his model. According to him our minimal conscious experiences still have a "minimal temporal depth". However, it is possible both that contents present temporal relations and that they do not (for example quasi-instantaneous thoughts or pinpricks pains). Thus, on the one hand, he opts for avoiding instantaneous contents at the base of the extensionalist stream. On the other, he ends up reducing the import of Subjective Dynamism, since there are extend atoms[74].

The committal to extended phenomenal atoms is surely a cost *per se*. No other theory of t-events perception is so metaphysically loaded. The Overlap Model relies on

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[73] The charge of whether co-consciousness is apt to acts unification still remains.
[74] Dainton (2014a) reports an example by Walker (1978), according to which there may be in a time-less world where inhabitants are able to instantaneously apprehend scripts presented on signs. This might count as a completely instantaneous perception according to Dainton.

a lot of metaphysical and mereological assumptions that are not straightforwardly accepted: the idea of extended simples, the idea that there is a mereological compositions of experiential parts, the subsequent assumption that the global act of perception must have something more than perceptual parts like co-consciousness[75]. But the metaphysical burden is not over, the admission of such extended phenomenal atoms brings about further objections and costs. Please notice that the issue is not just that "atoms" in general are postulated, this would simply be the direct upshot of an Experiential Parts Strategy, on a par of a NonExperiential Part Strategy like Philips's (2014a). The point is that a *particular kind* of atoms, namely *Extended Atoms,* are required, and this is metaphysically costly.

Firstly, since Extensionalism should explain how we come to have "subjectively dynamic" perceptions of t-events, the circularity charge remains for "dynamic" atoms. It seems that the explanatory power of why we undergo perceptions of temporal relations is ultimately resting on these already extended atomic perceptual acts. The subjective dynamist may insist on the irreducibility of the extension of the act, but this sounds as a surrender for the Overlap Theorist: the Overlap Model cannot explain the phenomenology of t-events delivered by perceptual atoms.

Secondly, if short perceptual acts of this sort are still extended, they present extended contents. These contents must be unified, thus the information they present have to be co-conscious. If they are co-conscious, they have to count as full-blown single acts. But then how can we make sense of Overlaps? These atoms, *qua* atoms cannot have parts to share and the conscious experience unfolds by these discrete blocks. Thus, we seem to be back to something close to the *Pulse Theory* (Sprigge 1984) we departed from.

Thirdly, the extended atoms still require a unification in order to present the various phases of movement, otherwise we are still back to the Paradox of Temporal Experience and to the collapse threat. The solution by Dainton (2014a) is to assume that these "dynamic" atoms are such that they enjoy a "Minimal Independent Duration" (MID), according to which, conscious experiences shorter than this MID cannot count as conscious experiences on their own. The most natural interpretation of this claim is that

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[75] According to Chuard (2017) it is the absence of this latter assumption that makes his Resemblance Theory more parsimonious than the Overlap Model, which is committed to that instead.

there are no parts of the atom in abstraction from the whole. But then one may wonder why this does not count as a form of *Naïve View,* which is based on the same assumption about the priority of the whole over the parts.

The last line of suggestion by Dainton (2018) is to assume that the extensionalist structure is to come back to the dilemma posed by Subjective Dynamism and argue that, ultimately, atoms are not the way, and the conscious experience is *gunky* in structure. Probably this move gives the Overlap Theory the metaphysical resources it needs, but still, it is a theoretical cost to be committed to such another controversial metaphysical view.

It seems in the end that the source of all problems is the tension within the Overlap Model between some phenomenological claims about co-consciousness and the role metaphysics plays at accommodating it. It is difficult to keep all the *tenets* of the Overlap-Model together without assuming that co-consciousness has a metaphysical import (MET co-consciousness). But this makes the Overlap Theory close to an objectively-gapless (and empirically disputable) theory of the stream. The obvious option to have MET co-consciousness and a discontinuous neural realisation of the stream is to give up the correlational or the identity principle, rejecting the idea that the time of perceptual experience is determined by the times of the neural vehicles. And, as we will see in section 3.2.6, this brings about a form of dualism[76].

On the other hand, if one wants just to adhere to NONMET co-consciousness, and allow for gaps, then the irreducible, inexplicable, primitive character of this relation sounds like a profession of faith. If we admitted pulses with gaps, then it would be reasonable to consider these as two acts of perceptions with unified contents. It seems that, at the minimum, contents within the pulse are unified in virtue of being presented to the same pulse. On the opposite, overlapping NONMET co-consciousness should express that a form of diachronic unity is in place among contents belonging to different pulses.

My last objection is directed against this latter proposal and it is based on the idea that there is no match between the metaphysics of perception and its

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[76] The sense-datum theorist Dainton (2000) may accept this conclusion.

phenomenology (since diachronic unity leaps over the pulses of perceptual experience). My question is how it can be that contents belonging to two different pulses comes to be unified whilst violating the *minimum requirement* that belonging to the same act is necessary for the unification of the content. Let us see this with an analogy: I may have two numerically different stones on which I draw two halves of a heart. As long as I keep them separated, the drawing cannot compose a picture of a whole heart. In the same way, contents belonging to different pulses cannot *ipso facto* be diachronically unified to compose a whole new content[77]. Hence, overlapping NONMET co-consciousness is not just useless. It is wrong.

Things are different if we assumed a kind of explanatory machinery similar to the one of the Resemblance Theory: in this view contents are not diachronically unified but the *continuity of the represented* is guaranteed by the fact that we do not notice gaps and that perceptions run at a *fast pace*. But we have repeatedly stressed that this is not where the Overlap Theorist wishes to go.

Taking stock. The Overlap Model is built up to accommodate many principles of the debate (1.2.1). However, the price to pay is a metaphysical commitment to problematic phenomenal atoms or to a gunky structure of conscious experience. None of the other theories is so metaphysically committed. This is mainly due to the fact that the overlapping co-conscious acts either have a metaphysical import or they do not. In the first case the Overlap Model is committed to an implausible metaphysical continuum of the stream, in the second case co-conscious seems just *ad hoc* to make a differentiation between the overlap model and the pulse or resemblance theories. And, if Hoerl (2017a) is right, the boundaries between these two are not so sharp, making the Overlap Theory near to the collapse onto a Deflationist Model.

3.2.4 The Naïve View

Arguably, the Naïve View is the mainstream in the extensionalist camp. It is endorsed in various forms by Ian Phillips (2010, 2014a, 2014b, 2014c), Oliver Rashbrook-Cooper

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[77] This works also if we take some forms of unrestricted fusion according to which two detached pulses can count as one fusion-entity. This kind of fusion is not sufficient to have the fusion of the content, as the analogy with the drawn heart suggests.

(2013, 2016, 2017), Matthew Soteriou (2007, 2013) and Christoph Hoerl (2009, 2013, 2015). It is based on the idea that our perceptual experience *unfolds* along with the content it presents, in a way respectful of *Metrical Mirroring*.

The Naïve View is based on a series of cornerstones. The first of one is the extensionalist idea according to which a succession of perceptions is necessary for a perception of succession. Indeed, the basic, *naïve*, mechanism for the explanation of t-events' phenomenology is the idea that we are successively acquainted with the various phases of the t-event. Let us suppose I am looking at a geometrical shape rapidly changing colour from red, to blue to yellow. This sequence causes me to undergo a series of perceptions, namely the perception of the shape being red, followed by the perception of the shape being blue and finally the perception of the shape's being yellow. Order, duration and succession of perceptions follow the order, duration and succession of the content, following the assumption of *metrical mirroring.* Let's call the first cornerstone of the Naïve View "Pseudo-Jamesonism".

The second cornerstone is related to the temporal location of the perceptual experience in respect to the temporal location of the t-event. The idea is that there is no need for a certain t-event to be *completed* in order to be perceived: the perception occurs along with its content. This makes the Naïve View an "occurrent model". It contrasts the "completion model", according to which t-events (or some significant parts) may be perceived only when they are already in the past (Rashbrook-Cooper 2013). Let's call the second cornerstone "Occurrency".

The third cornerstone is the acceptance of the *specious present*. This is important: it implies that the Naïve View is committed to both the *immediacy thesis* and *diachronic unity.* Hence, the Naïve View denies that other faculties than perception are involved in our conscious experience of change, motion and persistence. To make a long story short, Naïve Viewers like Rashbrook-Cooper (2013), Soteriou (2007, 2013) and Phillips (2014a) have in mind a NonExperiential Part Strategy, according to which the extended whole has a form of metaphysical priority over the perceptions occurring at specific instants. The development of this idea will be the topic of the rest of this section.

Finally, Naïve Viewers are usually inclined toward a Naive Realist View of general perception (Soteriou 2007; 2013; Hoerl 2013; 2017a). This is no surprise since Retentionalism is commonly understood to be the natural approach for people with

representationalist inclinations (Section 3.3). I do not think that it is straightforward that Extensionalism goes with Naive Realism and that Retentionalism goes with Representationalism (see Appendix4). However, all the Naïve Viewers I mentioned accept Naive Realism and assume it for their arguments. Therefore, the story simply goes, in experiencing "A before B" we bear an acquaintance relation with the objects of perception and this relation *unfolds* over time. Firstly, I see A, secondly, I see B. Therefore, the idea is of a parallel *unfolding* of the awareness relation and the unfolding of t-events in time and this delivers the phenomenology of t-events.

To recap the Naïve View is committed to the following:

- **Pseudo-Jamesonism**: a succession of perceptual experiences is still necessary for a perception of succession.

- **Occurrency**: the perceptual act occurs along with the t-event, rather than at its endpoint.

- **NonExperientialParts**: diachronic unity is reached by assuming the whole extended perceptions be metaphysically prior than the parts.

- **Naïve Realism**: the phenomenal character of a t-event is constituted by the real temporal properties of the t-event outside.

In what follows, we will spell them in more detail, especially in relation to how the Naïve View reaches diachronic unity. In section 3.2.2, we underlined how reaching diachronic unity is of double importance for extensionalist theories, since on the one hand they are committed to a form of specious present, on the other, they are under the collapse threat into some deflationist models. This is especially true here.

In contrast with the Overlap Model, in which co-consciousness was ultimately responsible for diachronic unity, in the Naïve View it is *prima facie* less clear how to achieve a perception of succession from a succession of perceptions. The brute admission of a specious present is not enough without an account of *how* the subsequent contents presented to a perceptual experience come to be diachronically unified, *i.e.* an account of how the specious present arises as the source of our *immediate* awareness of t-events. Naïve viewers are still in charge to reply to this question, since both the overlap theorist and the retentionalist have a sketch of an

answer (co-consciousness and PSA respectively)[78]. Providing an account for how to reach diachronic unity is of double importance for the naïve viewers: from the one hand, it allows the Naïve View to explain the phenomenology of t-events by accepting the *immediacy thesis, i.e.* by avoiding the appeal to mental faculties other than perception. On the other hand, it avoids the collapse charge of the Naïve View on Deflationism, since, as we saw in sections 1.8 and 2.1, diachronic unity is what marks the distinction between these kinds of Deflationist Models and a Specious Present Theory.

We can start illustrating the collapse charge by noticing how the Naïve View is dramatically close to the *Beam View* described by Dainton (section 2.1). According to the Beam View, a punctuated ray of awareness (i.e. awareness of instantaneous states of affairs) simply "moves" along time giving the subject the impression of motion, change ad persistence. In section 2.1, we described it as the "continuous" version of the Resemblance Model (although this "continuity" element is not strictly speaking necessary).

The collapse charge seems more vivid if we endorse a line of reasoning like the following: 1) we should ask what it means for a relation to *unfold over time.* Since relations are quite abstract things, it is plausible to say that it means that the *relata* keeps this relation on for an interval of time *dt*. Thus, If a subject holds an awareness relation with a t-event, he is holding it for an interval of time *dt*. 2) It is plausible that at each instant *t* of the interval *dt* the subject holds a relation of acquaintance with a single phase of the t-event (the one occurring at *t*). But at this point we have the full-blown *Beam View*, with all the problems of the deflationist models (chapter 2)[79]. Thus, diachronic unity is central for understanding the Naïve View and understand whether it is viable.

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[78] I disagree with Hoerl (2013) on this. It is true that reaching diachronic unity is a problem that *both* Retentionalism and the Naive View face in order to account for the phenomenology of t-events. However, Retentionalism can enforce its claim by stating that PSA is both necessary and sufficient for diachronic unity, and thus it has a clear answer that the extensionalist lacks. Here it is sufficient to treat PSA as merely necessary in order to carry on the dialectic between Extensionalim and Retentionalism.

[79] However, the commitment to Naïve Realism would at least spare the charge of circularity (Hoerl 2013). The other side of the coin, as we will see in a moment, is that the Naïve Realist cannot exploit the temporal profile of representations to secure a perception of succession from a succession of perceptions.

The way in which the Naïve View replies to this objection sheds light on how the cornerstones interact. At the base we have the so-called *occurrent model* (Rashbrook-Cooper 2013):

> "On [Soteriou's model][80] (we can call it the 'occurrent' model), we have a picture according to which it isn't the case that the fact that it seems to the subject that P entails that it *seemed* to the subject that P. In the case of the subject being aware of the red ball, this model tells us that, unlike on the 'Completion Model', we can say of S that 'it seems to S as if the red ball is moving from P1 to P5' *before* the ball reaches P5 [...] We no longer have to agree that it only seems to the subject that P after the relevant appearance has been completed" (Rashbrook-Cooper 2013: 604-605, *original italics*)

(P is simply a t-event, like the ball that moves from position P1 to position P5). The idea is that our perception of a t-event is *state* whose obtaining is dependent upon a process. In the case under issue the process is the t-event P itself, involving the ball moving from P1 to P5. The take home message here is that it makes sense to say that the perception of P does not require that the P is concluded in order to occur. A key feature of this model that should help with the collapse charge is explained by Soteriou (2007, 2013), who stresses that perceptual awareness is actually dependent on a t-event, which is not "*homogeneous down to instants*". Thus, Soteriou makes the following example, contrast:

1) I have loved Mary for ten years
2) I have walked for the interval *t1-t3*

Sentence 1) represents a state of affair which is homogeneous down to instants: at each instant of the 10 years interval I loved Mary. Thus, in whichever instant in the middle of ten years, it would *have been true* that I loved Mary. My action of loving Mary is *completed* at each instant. 2) represents an activity: at *t2* I probably stood with the foot lifted on the ground, which is not walking. Hence, at *t2* the action of walking is not complet*ed*: the action of walking is occurr*ing.* And the fact that at *t2* I am *walking, (i.e.*

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[80] Rashbrook-Cooper (2013: 604) is explicitly making an exegesis of a quote from Soteriou (2007:554), which he reports in his paper.

that an activity is occur*ring*), instead of simply standing with the foot lifted, depends on what happens before and after that instant, namely along all the interval *t1-t3*. In conclusion, claim 2) does not represent a state of affairs which is homogeneous down to instants.

The mistake in the collapse charge, according to Soteriou (2013), is to believe that perceptual awareness is something resembling the state of affairs in claim 1) instead of the state of affairs in claim 2). As far as I can see, Soteriou seems to suggest that the charge of collapse would not properly take into account the second *relatum* (*i.e.* the unfold*ing* t-event). Indeed, from the fact that a subject is aware that I am walking, during the interval *t1-t3*, it does not follow that at t2 the *subject's awareness* of walking is completed. In Soteriou's (2007: 553) words: "*From the fact that S was aware of x phi-ing during the interval t1 to [t3], it does not follow that at [t2] S had already been aware of x phi-ing*". However, it still follows that at *t2* the subject is aware that I am walking. My walk is the occurring t-event to which the subject is perceptually related. In other words, to define what one is perceiving at *t2*, one has to take into account the whole interval *t1-t3*, since the t-event is not homogeneous.

Unfortunately, this is not enough to secure the Naïve View from the collapse charge. So stated, the occurrent model brings about the idea that at each instant we are perceiving the *same* process (of walking), but it cannot be the case that at each instant we perceive *the whole* process (of walking). The latter would be a breach within Metrical Mirroring. Thus, the fair conjecture is that at each moment in which the subject perceives me walking*,* she does so *in virtue of* being aware of a certain *stage* of the process, for example that my foot is lift*ed* at *t2*. The same line of reasoning can be applied at *t3*: the subject is aware of me walking *in virtue* of perceiving my foot having hit the ground at *t3* (and so on). The obvious drawback is that now it seems that the perception of the occurring process boils down again in the succession of *completed* stages of the process, *in virtue of which* the subject is aware of the whole process. This is both what the Beam View predicts and a return to the *Completion model*.

The answer by Naïve Viewers (Soteriou 2007, 2013, Rashbrook-Cooper 2016, Phillips 2014a) is the denial of the legitimacy of this rejoinder. By their lights, this version of the collapse objection does not take seriously into account the NonExperiential part

strategy cornerstone of the Naïve View. The Naïve Viewers start by analysing that this move by the Beam Viewer is based on the assumption that the whole perceptual awareness of a t-event is metaphysically dependent on the point-like perceptual awareness of instantaneous stages. In other words, the "*in virtue of which*" story by the Beam Viewer hides the idea that a complex perceptual experience, like that of a t-event, is based on the mereological sum of experiential parts *grounding the whole.* Indeed, the Beam Viewer is question-begging in this case: she has already assumed that the NonExperiential part strategy of the Naïve View is not in play. That is to say, she has already assumed that there is *no diachronic unity*.

By assuming the NonExperiential part strategy, the Naïve Viewers take the "*in virtue of which*" story to go exactly in the opposite way. It is *in virtue of* being in relation with the process of walking, that the subject perceives the *lifted* foot at t2 (and not *viceversa*). In conclusion, naïve viewers suggest that at least three related but of high importance tasks are devoted to the NonExperiential part strategy: *firstly,* it is an account of diachronic unity, thus it is an account of how the extensionalist specious present is generated. *Secondly,* because of this, it avoids the collapse charge into the Beam View. *Thirdly,* it "disambiguates" what one perceives at a certain instant: only by taking into account the *whole perceptual experience* over a longer interval, the subject *recognises* that she is perceiving me walking at *t2*, rather than standing with a lifted foot at *t2*.

Given the vital importance of the NonExperiential part strategy for the Naïve View, it should not be a surprise that the main objections are against this cornerstone. Firstly, the NonExperiential part strategy seems to render the extensional character of the act *explanatory useless*. While in the Overlap Model it was the adding of new perceptual experience (its *extension*) that would create a new whole perception with a new specious present encompassing the various t-event' phases, here it seems that the explanatory story is reversed. The whole-first strategy seems to take it for granted that there is a specious present (the extended experiential whole itself) and impose the extension to the vehicle[81]. Thus, it seems that the extension of the perception has no

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[81] Compare this with *inheritance* (Phillips 2010, 2014a,2014b,2014c) (Section 1.7.3).

role in solving the Paradox of Temporal Experience: on the opposite, it is its solution, *i.e.* the diachronically unified/whole-first specious present itself, along with the acceptance of Metrical Mirroring that brings about the Naïve View in turn[82]! The Naïve View comes to be a view about the metaphysics of perception rather than a view about how the perception of t-events is possible[83]. It rejects the idea that the temporal properties of the vehicle have a role at solving Kelly's paradox.

However, there is a second objection to the Naïve View. It is about the strange metaphysical inflation for which the NonExperiential Strategy is responsible for. This inflation is the direct upshot of a NonExperiential Part strategy for *diachronic unity*. In order to explain this objection, we should recall the idea that at the heart Extensionalism is the position according to which our sensory experience *unfolds* parallel to the t-events we are perceiving. The analogy is with a *download bar* increasing along with the amount of downloaded data on a computer. However, this "download bar" idea has to be rejected in order to accommodate the NonExperiential part strategy.

Let us start with a little example: let us assume that we are perceiving a ball moving, from location L1, to L2, to L3. For the sake of simplicity, let us assume that we perceive it at *t1,t2,t3* respectively, and there is no distinction between the temporal location of each content, and the temporal location of the occurrence of the perception (*i.e.* let us ignore all the physiological delays at elaborating the stimuli). The most straightforward, *naïvely conceived*, way to account for the perceptual experience of the ball is to say that at *t1*, I see the ball at L1[84]; at *t2*, my vehicle extends and I have got an extended perception (lasting *t1-t2*) of the ball at L1 and L2; at *t3*, my perceptual experience stretches again and I have got a longer perception (lasting *t1-t3*) of the ball moving (L1-L3). In this simple scenario, we are assuming that some form of *diachronic unity* is in place, since we are presented with the movement of the ball at different

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[82] This is not a problem for the Overlap Model which reaches diachronic unity through Co-consciousness.
[83] A thought may be that extended vehicle avoids the problem of the chord, which rises from the momentariness of the act. But this advantage is lost when we have to appeal again to the temporal order and duration of the phases of the t-event in order to account of why contents presented together to the subject are perceived as non-simultaneous (Dainton 2018).
[84] This is an instantaneous act, thus something which is not admitted by the extensionalist. However, on one hand we may say that this is just a simplification, plausibly my perception at this moment extends from previous perceptions. On the other hand, the extensionalist should recognise that there is a certain point in the morning in which our act starts *unfolding*. That would be an instantaneous act.

locations. How should we interpret the diachronic unity in place here? Let us compare the two Experiential and NonExperiential strategies, to explain it.

The Overlap Theory, which exploits an ExperientialPart strategy, assumes that simply some more perceptual experience is added to the previous stretch. Let us recall the ExperientialPart strategy at the synchronic level. Let us make the example of a multimodal, unified sensory experience of a motorcycle. When we pass from the sensory experience of the shape of the motorcycle to the perception of the shape and the rumble of the motorcycle, we are actually undergoing two *numerically distinct* perceptual experiences (the perception of the shape of the motorcycle and the perception of its rumble) that are somehow fused together to deliver the unified content. In the diachronic case, by analogy, when we pass from the perception at *t1* of the ball at L1, *new* visual experience, which is numerically distinct from the previous stretch, is added to form the content.

In the Naïve View this cannot be possible, and the reason is simple. Let us recall what happens in the NonExperiential Part strategy in the synchronic case: when we pass from the perception of the shape of the motorcycle to the multimodal experience of the shape and the rumble of the motorcycle, we have a *completely new act* replacing both the perceptual act of the shape and the perceptual act of the rumble. This comes not to be a surprise, if we added numerically distinct acts, we would be back to the ExperientialPart strategy. At the diachronic level this means that when we pass from the perceptual experience at *t1* of the ball at L1, to the extended act (*t1-t2*) of the ball at (L1-L2), we cannot simply add new bits with the same metaphysical status as those composing the previous stretch. Obviously, this is because it would imply that the whole sensory experience is ultimately composed by more fundamental atomic perceptual acts.

The alternative is to claim that when a new sensory experience is added, a new whole is created. But in doing so, we should admit that at each instant the created whole is a different one. Thus, when we pass from the perception *a* at *t1* of the ball at L1, to the extended perception *b* (*t1-t2*) of the ball at L1-L2, a new whole sensory experience comes into being. But now it becomes the case that the whole at *t2* is numerically different from the whole we had at *t1*. It is indeed *more extended* and encompasses a wider content. The same line of reasoning can be applied when the sensory experience

unfolds from *t2*, to *t3*: another whole *c* is created at *t3* which is more extended and, *ipso facto*, is numerically different from both the previous wholes. The resulting structure is the following (fig.7):

TimeLine

Fig.7 Infinite Many Perceptions
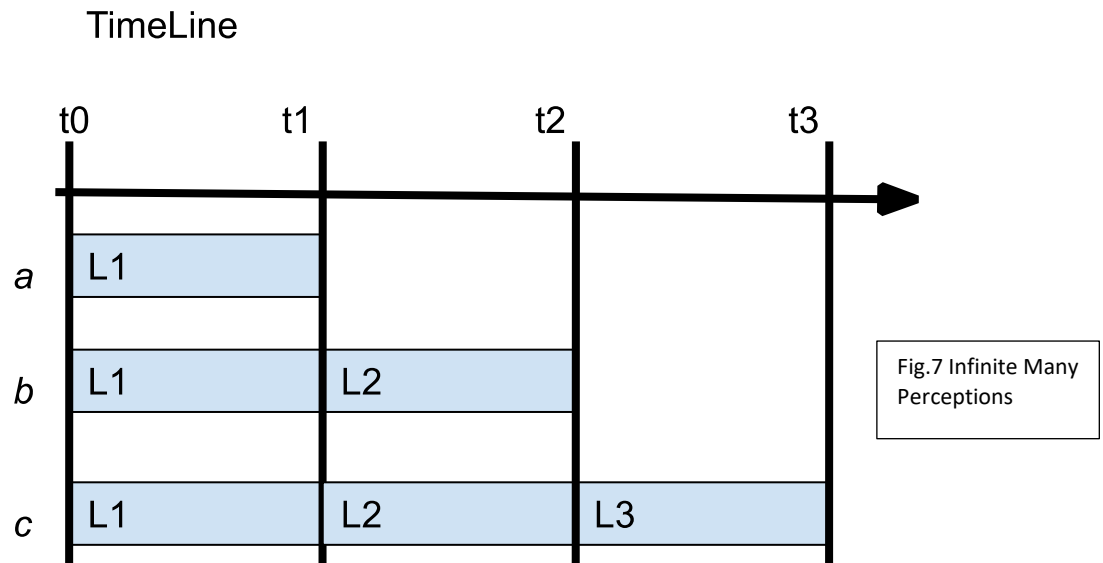
It comes to be clear at that at instant *t1* a subject undergoes three different perceptual experiences. From here it should be easy to generalise the point. By taking into account longer perceptions unfolding over a broader interval than this one, it would be easy to reiterate this line of reasoning in order to build a schema in which at each instant infinite many sensory experiences are presented to the same subject[85]. A naïve viewer may say that in the end, this is not unbearable phenomenologically speaking: after all, if we see a ball rolling from location L1 to L5, we would also describe our perceptual experience as presenting us the ball rolling to L1 to L4 and so on, and so forth. However, this reply neglects the fact that these perceptual acts have to be realised, and given the NonExperiential part strategy, each require a different vehicle which is not related to the others by any mereological relation. That is to say each vehicle has to be realised independently from the others.

An obvious reply is that this conclusion is too harsh. Because it may be the case that the new whole *literally* replaces the previous one when perceptual experience unfolds. This means that the previous whole comes to be annihilated by the generation

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[85] This may be done by taking into account the continuous character of time and experience, according to which in between two instants there always be another one.

of the following one. Thus, by following my schema, what really happens is that when perceptual experience *b* occurs, perceptual experience *a* is not around anymore. When *c* occurs, then *b* is no longer there. This reply does not work. Probably there are many questions to ask about annihilation and the strange backward impact that a subsequent perceptual experience has on the previous one. However, the easiest way to counter this rejoinder is to consider that it implies a real change of the past, which is a metaphysical impossibility (at least assuming the linearity of time toward the past). Thus, the naïve viewer should adhere to the metaphysically more demanding view, according to which at each instant[86] infinitely many perceptions are given to the subject, and this is computationally implausible.

These considerations about annihilation makes also clear why it cannot be possible to appeal to whole perceptions *lasting as long as the specious present lasts*. Let us suppose that the specious present lasts from *t1* to *t3*. The unfolding of the perception at *t4* would generate a new whole lasting *t2-t4*, creating the same repetition as before in the instant *t1*, *t2*. The generated structure is the following (fig.8):

Fig.8
Moving Specious Present
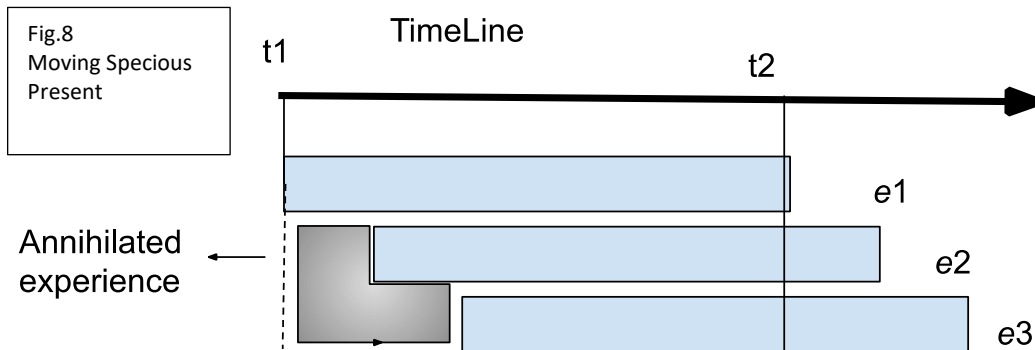
What is worst of this proposal is that it suffers from *both* the difficulties of the annihilation *and* the multiplication of perceptions at each instant. In the same vein a

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[86] Please notice that it is possible to argue that at any interval, multiple acts are presented to the subject. This can be seen by taking into account the interval (*t1-t2*) in which, according to my schema two acts (*b* and *c*) are presented to the subject. With longer acts, it is possible to reiterate my line of reasoning also for intervals instead of instants.

Sprigge-like pulse theory does not help. The *generation of each pulse* would follow the same pattern: at instant *t1*, a new perception occurs; at instant *t2*, a new perceptual experience is added, and so on and so forth, until reaching the *length of the pulse*.

One may be willing to accept that multiple sensory experiences are presented to the subject at each instant. The case of *postdictive phenomena* (sections 2.2.2, 3.2.5), however, puts some further pressure on the acceptance of this model. *Postidictive phenomena* are temporal illusions according to which the perception of a latter stimulus affects the way in which a previous stimulus is perceived. Let us analyse again what goes on in the case of the Cutaneous Rabbit, which is the one addressed by Phillips (2014a). In the Cutaneous Rabbit illusion, batteries of taps are given at different locations of the arms. In every condition they are given at the wrist. The two conditions differ in what happens after that: either further taps are given up to the elbow, or not. The subject perceives a mislocalisation of the taps only if taps closer to the elbow are given.

The fact that in the one condition taps are actually sensed at the wrist gives us reason to think that taps at wrist are, by default, felt at the wrist (since there is no way for our brain to decide whether following taps would occur or not). When new perception is added, i.e. when a new whole perception is created, and this encompasses batteries at different locations on the arms, the new whole presents the first battery of taps to be mislocalised. The result is the following (fig.9):

Fig.9 The cutaneous rabbit case
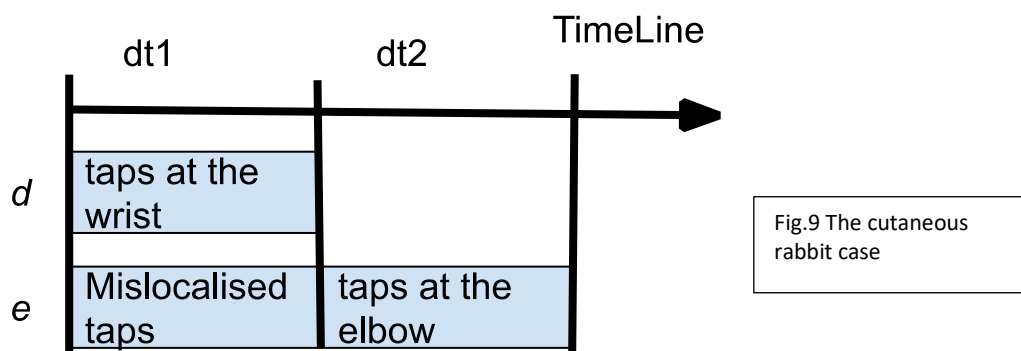
Now, as Phillips (2014a) recommends, if we asked to a subject what she perceived at *dt1*, we should take into the account the broader whole of which that tactile experience is part. If we take into account sensory experience *d*, the subject perceives taps at the wrist. By taking into account sensory experience *e*, the very same subject perceives

mislocalised taps. Given that the two tactile experiences *d* and *e* co-occur at *dt1*, it seems difficult to avoid the conclusion that both taps at wrist and taps mislocalised are contemporary present to the subject at *dt1*. This would not be a so bad result in a representationalist framework, which can accommodate illusions of impossible states of affairs (cf. Crane 1988). The naïve realist cornerstone of the naïve view, on the other hand, which has traditionally problems with illusions, would face the extra charge of accounting for the fact that the subject is presented with both an illusory experience (*e*) and a veridical one (*d*) and these contradict each others (this point has been rised, among the others, by Prosser 2016: 154). However, this latter point leads to the major concern at accepting this structure: It seems that we are *undermining synchronic unity* by admitting that at each instant we are presented with contents from different whole perceptual experiences, that are numerically distinct and, in some cases, even contradictory.

A diagnosis is needed here: what is flawed according to me is the fact that the naïve viewer wants both a) the idea that the perceptual experience one has at *tn* is somehow causally dependent from the sensory experience the she had at *tn-1* and b) a NonExperiential part strategy, according to which the perceptual experience a subject is undergoing at *tn* is independent from the previous perceptual experiences (see section 1.4). The tenet a) follows from the very extensionalist idea that the perceptual vehicle is *extended*. This kind of dependency is necessary for the following reasons: *firstly*, let us take again the example of the perception of the ball moving from L1 to L5. At *t1* we see the ball at location L1 (perceptual experience *e*). At *t2* we see the ball at location L2 (perceptual experience *e'*). Now let us assume that *e'* is not dependent from *e*: this means that the ball at L2 is alone sufficient to cause the occurrence of *e'* and *e* has no role at causing it. *e'* may have either an instantaneous or an extended content. If the content is instantaneous, then it makes sense that *e* has no impact on *e'*. But this means that we have two instantaneous perceptions which cannot be fused together because of the NonExperiential parts Strategy. So, the collapse on the Resemblance Theory is once again in place. *Secondly*, if we admitted for the sake of the argument that the content of *e'* is not instantaneous, there would be no obvious reason why the content of *e'* should show the temporal profile of the content of *e*. Indeed, without a sort of dependency of *e'* upon *e*, it may well be the case that at *t2* the subject undergoes

the perceptual experience *e'*: [L17, L2] when a *t1* she underwent *e*: [L1]. This brings about again the undermining of synchronic unity, since at the same instant *t1* the subject perceives both L17 (by *e'*) and L1 (by *e*). *Thirdly*, let us assume that, for whichever reason, the ball at L2 causes the occurrence of e', which overlaps in content with *e.* So, e' is extended and its content is [L1, L2]. There is a strange backward causation, since the ball at L2 at *t2* is sufficient to bring about the occurrence of some sensory experience of the ball at L1 at *t1*. This is unavoidable: metrical mirroring is in play. So, the vehicle's past *coda* must be backwardly caused in order to mirror the content. *Finally,* and conversely, let us now consider a perceptual experience *e''* presenting the ball in L3 at *t3*. If we want to say, along with the extensionalist that its content is [L1, L2, L3], we cannot say that L1 has a direct causal impact onto its content fixation, since it is too far in time from the moment *t3* in which *e''* occurs. The most plausible way to assign the content [L1, L2, L3] to e'' is via a causal chain connecting e' = [L1, L2] to *e"* (and of course *e'* should be equally causally connected to e = [L1] in turn).

The tenet b) is the NonExperiential parts strategy and it characterises the Naïve View in respect to the Overlap Model. However, applying it for diachronic rather than synchronic unity is not a good idea after all: the point of the NonExperiential part strategy in the synchronic case is exactly that perceptual acts renew rather than being retained as long as time elapses.

A natural option for the naïve viewer is to appeal to perdurantism, the idea that objects exist as a whole with metaphysical priority over the parts. If this theory were true, then perhaps it is not really the case that our perceptual experience *unfolds*, rather it exists tenselessly as a whole (so there is no really issue on whether at each instant a new bit of perceptual experience is added or a new whole is created). Perhaps a *Frozen Pulse Theory* is true, and the subject has some access to these pulses, which are already given, immutable, in reality.

As natural this thought be, it does not address my challenge. Indeed, it is question-bagging. Let us just ask this simple question: "Still, why under a perdurantist metaphysics, the Naïve View is committed to one single perceptual experience at each instant, instead that infinite many as predicted by my objection?". There is no answer and the reason is that Perdurantism alone is not sufficient to guarantee the uniqueness of the perceptual experience at each time. It is simple to see why: I described a

mechanism according to which the Naïve View generates too many perceptual experiences within a *temporal perspective.* Indeed, it is ultimately based on the causal network connecting stimuli and past acts of perception to new ones. And this causal network is required to make sense of Extensionalism in respect of other theories. Taking an *atemporal* outlook, as the endorser or Perdurantism does in order to describe his theory, does not spare the Naïve View from the generation of infinite many perceptual experiences *in time.* Indeed, the Perdurantist-Naïve Viewer is assuming against me that at each time we have just one perceptual experience, but there is nothing in Perdurantism that prevents that too many sensory experiences exist tenselessly at each instant. In other words, we are still owed with a story of why just one perceptual experience can be *only one* at each instant instead that infinite many. The shift to the atemporal outlook gives just the impression of solving the problem, but the problem is related to how things are *in* time: the atemporal perspective is neutral about this.

We have sketched some of the virtue and specific problems of the Overlap Model and the Naïve View. In what follows we will assess some problems for Extensionalism from empirical data.

3.2.5 Extensionalism and illusions

The vast majority of objections to the extensionalist theory are given on empirical bases and many efforts from the extensionalist camp have been advanced in order to make the position stronger in respect to empirical findings. The major contributions in this direction may be found in a series of papers by Ian Phillips (2014a, 2014b, 2014c), who discussed in length how empirical data may or may not affect the extensionalist position.

An important suggestion by Phillips (2014a, 2014b, 2014c) has to be taken into account. *Metrical Mirroring* must hold between the structure of the vehicle and the *apparent* content. That is to say, in cases of illusions involving changes or motion, the Mirroring Constraints have to hold between the temporal properties which are (inaccurately) represented in the content and those of the act[87].

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[87] This is interesting because a Naïve View coupled with Naïve Realism has to hold that Mirroring constraints also hold for different states than perception, namely *illusions*. This assuming that Disjunctivism is the standard way for a Naïve Realist to go to account for illusions and hallucinations.

In what follows, I take advantage from the review by Phillips (2014b) himself, who divides the empirical challenges to Extensionalism in three categories: the motion silencing effect (Suchow and Alvarez 2011; Watzl; Phillips 2014b; 2014c), the duration illusions (Lee 2014a; Eagleman 2008; Phillips 2013; 2014b) the already discussed postdictive phenomena (Dennett and Kinsbourne 1992; Shimojo 2014; Phillips 2014a; Phillips 2014b). In this section we will discuss the most problematic cases of duration illusions and postdictive phenomena. Silencing is postponed to APPENDIX3.

Some of empirical findings appealed to in order to counter the extensionalist proposal are related to illusion durations (Lee 2014a, Phillips 2013, 2014b and Eagleman 2008 for a review). Some cases are quite anectodical: people report that time slows down in frightening circumstances. In the Eagleman's (2008) review, it is reported an attempt to measure how much time slows down. People are pushed down from a 50m tower into a net below. The fall was 3 seconds long and participants reports that the fall lasted longer. Since participants were not able to increase their temporal resolution (for example they were not able to better discriminate stimuli running at a very fast pace), the experimenters concluded that there is not just one mechanism dedicated to time[88].

One interpretation of this phenomenon is by Stetson, Fiesta and Eagleman (2007): they pose the emphasis on the fact that there is no unitary mechanism of time perception, in order to say that memory is involved in duration perception. The slowing-down effect is due to an increase of mental activities which are recorded into memory. The duration judgments are thus biased by the great amount of information previously stored. Of course, this interpretation is not available for the extensionalist, whose commitment to the *Principle of Presentational Concurrence* implies *the immediacy thesis* about duration perception.

However, such mirroring constraints seem to be implausible in scenarios like this one: an account of this duration distortion based on mirroring would imply that the perception lasted as long as the felt duration. This is the direct application of the *Principle of Presentational Concurrence and/ or Inheritance* (namely Phillip's idea that the temporal profile of the content is imposed to the vehicle. Section 1.7.3). This comes

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[88] Analogues suggestions follow studies on the effect of drugs like methamphetamine on duration discrimination (Meck 1996).

to be implausible, since it would create a significant lag between perception and reality that could always increase in absence of compensations (Lee 2014a).

The reply by Phillips (2013, 2014b) is to go for a *relational view* of duration perception. The most important feature of his proposal is that we should not be deceived by the reports of participants. In cases of frightening situation, people tend to judge that everything in their environment slows down, and this may lead to think that people misperceive the *absolute duration* of t-events in these circumstances. As far as I can see, with "absolute duration" Phillips means the duration of the event *simpliciter,* which does not depend upon anything other than the temporal location of the t-event itself. A useful analogy by Lee (2017) helps to understand the point. Probably the very same table look like bigger to a mouse than to me. This because the mouse represents the table to be of a greater size *relatively* to its own size and the same is true for me. However, *absolutely speaking,* we are perceiving the same object with the very same size. Phillips (2013) is trying to capture the same point with duration of t-events, whose perception includes an element related to the perceiver. As Lee (2017) suggests and Phillips (2013:229) recognises, there is a trivial pitfall to avoid here: there cannot be anything like the duration of the t-event as related to a certain objective unit of measurement of time like seconds or centuries: our perception does not present things this way (Peacocke 1992).

In order to pick up the element we should relativise duration to, Phillips (2013) starts noticing that that there is usually a double report by people undergoing frightening experiences. As well as reporting that "time slows down", they also report an increased speed in their thoughts. In other words, in frightening circumstances, we have an augmented *non-perceptual* mental activity. That is to say, in frightening circumstances we have more thoughts, emotions and other states than in the same interval in normal circumstances. Thus, the phenomenology of duration has to be anchored to this underling mental activity, in the same way in which our visual experience of a *big* skyscraper is related to our comparatively *small* size.

The following is a caricature of the view, but I think It is not so distant from what is going on here. It seems to me that what Phillips has in mind is that our perceived duration of a t-event is something like the following: instead of presenting a t-event *lasting as n seconds*, the system may present the t-event *as lasting as* n *thoughts,*

assuming that, in normal conditions, there is constant *pace* at which thoughts unfold (in the same way as the pace of the clock is constant at producing ticks) (cf. Phillips 2012). Moreover, Phillips (2012: 296) is explicit about the fact that the amount of mental activity involved in perceiving duration is made up by *conscious non perceptual activity*[89].

At this point two considerations follow: 1) the actual duration of the vehicle (the *inherited duration,* in Phillips's terms) is that of this relative duration which is equal to both the actual duration of the t-event and the interval of time occupied, in normal condition, by a certain amount of mental activity. 2) The fact that people tend to make judgements about an *absolute* slowed down duration of t-event is due to *post hoc* judgments: people tend to retrospectively judge that the absolute duration of the t-events lasted more because they refer to the amount of non-perceptual activity as a valid indicator of duration. If the fall lasted 3 seconds, the amount of non-perceptual activity may be equal, for example, to the one that at normal pace would have occurred in 5 seconds (let us say). People make the mistake to treat this mental activity as occurring at the usual pace and therefore they estimate the duration to be longer than what it is. It is the same mistake of a person looking a chronometer which runs faster than usual: it signs that more time has elapsed than what is really the case.

At a closer look this proposal is unpromising. The move by Phillips assigns a great role to non-perceptual mental activity in order to make duration an *inherited* property. The proposal comes to be that whenever we perceive the duration of a certain t-event, we come to do it in relation to the amount of conscious mental activity in place. This comes to be implausible. Indeed, given the definition of *inheritance* (section 1.7.2) we should claim that the properties *of the content* are inherited by the structure of the perceptual act. The idea of considering duration a relational property, presenting the t-event in relation to non-perceptual activity, means that in normal circumstances the perceptual content presents both *relata*: the t-event *and* the non-perceptual mental activity[90]. Now given that our perceptual experience of duration is ubiquitous

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[89] Please note that stating that this conscious states are part of the phenomenology of duration is different from saying that other internal states like affect duration measurament (cf Wittman and van Wasshenove for a review of these).

[90] Compare this with the general formulation of the Relational Principle (section 1.1 and 2.1).

(everything has a duration), it follows that our perceptual contents are *massively invaded* by this amount of non-perceptual mental activity. And we should bear in mind that the properties captured by the content, in both a representationalist and a naïve realist theory, *constitutes* our phenomenology.

This makes the proposal by Phillips strange for a series of reasons. Firstly, it is a kind of perceptual phenomenology which is not caused by anything outside, but which is still primarily related to things outside[91]. In this case it is not even assimilable to "proprioception", since the latter targets exclusively internal states. Secondly, it is common to assume that we can access to the amount of internal/ non-perceptual mental activity only via a second-order introspective act, targeting that very amount of mental activity. But here it seems that we are immediately given with our mental activities in the first-order perceptual states, in the same way in which we are given with redness in the environment. It seems strange to me that we are aware in this way of what goes on inside, namely by eluding introspection. Thirdly, this strategy is also suspicious for the Naive Realist endorsing the Naïve View: there is a strange amount of *cognitive penetration* in our perceptual content. This usually goes with a representationalist account of perception (Cavedon-Taylor 2018). Finally, as Arstila (2017) suggests, Phillips's proposal has been accused to conflate two things that we have empirical reasons to take separated, namely retsopective judgements about durations and judgments about how fast time passes (Wearden 2015)[92].

Another case against Extensionalism is about other discussed findings, according to which under a certain threshold we are able to perceive events in succession, but we are not able to perceive their order (Mitrani, Shekerdjiiski, and Yakimoff 1986; Hirsh and Sherrick Jr. 1961). The move by Phillips (2014b) is to drop *topological mirroring* (the idea that the order of the content is mirrored by the order of experiential parts). He stresses that his own interpretation of Extensionalism correctly predicts that the two perceptions are in a succession, but the order is not *inherited*. Thus, he says that, in this case, the properties *inherited* by the perceptual experiences are not topological, and we

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[91] Thanks to Giuliano Torrengo for underlining this point to me.
[92] This is true even if we do not believe (contra Wearden 2015) that there is no phenomenology of the passage of time. *Reports* rather than phenomenology about time's rate are what are at issue.

are left with just *Structural Mirroring.* This seems to leave us with a so watery mirror constraint that it is doubtful that it is of any use. We have already said in section 3.2.1 that a theory dropping *Topological Mirroring* may allow for weird perceptual experiences that do not follow the order of the events in reality and this is not plausible from an evolutionary point of view. Here Phillips seems to go exactly in this direction by assuming that, in the end, it happens there is a structural correspondence between the two stimuli and the experiential parts, but perceptions may be ordered in any way. One may adopt a *Time-Marker* (section 1.8) view to settle this at the level of realisers, but this has unpalatable consequences for the extensionalist, as we are about to see in a while. Moreover, the main concern remains: the explanatory work of metrical mirroring in account for our phenomenology of t-events gets significantly weaker, since order and, arguably, duration are not accounted for in terms of order and duration of the perceptual act[93].

Other empirical cases on duration illusions that are supposed to challenge Extensionalism are and the slow-down of duration perception in subjects assuming drugs like methamphetamine and the Oddball Effect. The latter is the well-known phenomenon according to which when we are presented with a sequence of identical stimuli but one (the oddball), we report the first of the stimuli and the oddball to last longer than the others, even though they have the same quantitative duration[94]. As far as this phenomenon is concerned, Phillips may pose compensation mechanisms in order to have a correspondence between the absolute duration of the whole sequence and the duration of the perceptual experience. This accommodates the perceived dilation of the oddball by subtracting time to the other stimuli. As far as drugs are concerned: they are phenomena belonging to wider time scales, so they outstrip perception.

The last group of empirical data to assess in respect to Extensionalism is the already mentioned postdictive phenomena, like the Cutaneous Rabbit illusion, and apparent motion. Phillips (2014a, 2014b) is one of the few that discusses the Cutaneous

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[93] Vallteri Arstila points out to me that there may be theoretical reasons to reject the idea that the findings question show that we can perceive unordered succession. This would spare Phillips at least from this charge. However, more work is needed here.

[94] Here an example of the Oddball effect: https://www.youtube.com/watch?v=W7uLwUHuxRM

Rabbit Illusion. Thus, I will stick to that. Again, the challenge is why we have two different conditions in which different reports are given to the same data. In one condition, two batteries of taps are given to the wrist, while in the second condition two batteries of taps are given one to the wrist and one to the elbow. Part of the taps at wrist in the second condition are sensed as shifted toward the elbow. Recall, this is puzzling, since the position of the taps cannot be elaborated without the occurrence of the stimuli located closer to the elbow. It creates a paradox: the data show that the occurrence of the following stimuli actually affects the sensed location of previous ones. The usual strategy by the extensionalist is to provide a *Stalinesque* elaboration of stimuli (section 2.2.1), according to which there is a "supplemented content" (the stimulus being at the intermediate location) (Dainton 2018). As Hoerl (2015) points out, the cost of this strategy is to give up the naïve realist assumptions behind the Naïve View: whatever the supplemented content is, it cannot be something real in order to explain the phenomenology of the postdictive phenomenon under issue[95]. This reason pushes Phillips to the direction to a third way to account for postdiction phenomena, the "Extensionalism without Stalin view".

As far as I can see, the aim of Phillips is to accommodate Arstila's (2016b) *minimal delay principle* according to which a stimulus becomes conscious as soon as its elaboration is over. The idea by Phillips is to capitalise the claim that the whole perception is metaphysically prior than its parts, thus, in order to account for the location of the second batteries of taps, one has to take into account also what happens in the instants following that in which the misperception of the location occurs. Phillips stresses that, according to Extensionalism, it is illegitimate to ask what a subject perceives at a certain instant in abstraction from the extended perceptual experience of which it is part. Since the whole perceptual act is different in the two conditions, *i.e.* the fact that there are (or there are not) taps closer to the elbow makes a difference in the

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[95] Hoerl (2015) is primarily concerned with *beta motion.* I believe that this supplementation point he makes can be translated to the cutaneous rabbit case, since also here there is a mind-fabricated content regarding the location of the second battery of taps. In order to defend the naïve realist assumptions behind Extensionalism, his strategy is ultimately to reject the accuracy of the reports in case of *beta motion.* Indeed, he claims, following Wertheimer (1912), that in case of *beta motion* people are able to distinguish apparent motion from genuine motion and that, in the end, our act is of two instaneous dots whose occurrence is sufficiently similar to those of motion that people are induced to misreports.

nature of the two conditions, the perception just after the first stimulus must be constitutively affected by what happens next.

An extensionalist may follow Phillips and be apparently safe: the two considered perceptual acts are actually different. However, it seems that this answer misses the point. What is at stake here is not what is perceived at a certain instant, but *how* to conciliate the acceptance of Metrical Mirroring and the fact that the control condition (the one in absence of the following stimuli) proves that we do perceive all taps at the wrist after in the first battery. It seems that the tactile experience of mislocalised taps can occur only concurrently with the perception of the following taps (or even later), since there is no way for the system to *predict* where the taps of the first battery should be localised. This is clearly a breach in the Mirroring Constraints and this is what Phillips does not explain with his whole-first strategy. However, it should now be clearer why the Stalinesque strategy comes in play for the extensionalist: it restores the correct order of presentation of the contents in virtue of the subpersonal elaboration.

Secondly and relatedly, the overall strategy by Phillips is to claim that it does not really make sense to ask what a subject perceive at *t*, without taking into account what happens in the interval. However, given the formulation of Phillip's own *inheritance* (section 1.7.3), this move is like cheating. If the perceptual vehicle inherits the temporal structure of the content: it must inherit also the temporal order of the phases. What postidictive phenomena show at the heart, is that, without a subpersonal elaboration (and its costs in terms of extra delays and/or the issues rised against the NonLinear Latency), the vehicle does not inherit the order of the content: the content has a temporal order, and, at best the vehicle has another (since motion can be perceived only when the second dot appears). And this is independent from the fact that the two conditions are different. Probably we can relax the requirement of asking what a subject perceive at a determinate instant *t*. But still, asking for the order of the vehicles in respect of the order of perceived contents is a legitimate question.

Finally, I find it a little bit suspicious this overall move: an extensionalist going this way seems just to pursue an ostrich strategy, she brutally denies that the whole perception conforms to the way in which Extensionalism conceives the *unfolding* of the perceptual act (*i.e.* the idea that the order of the experiential phases is determined by the order of the perceived phases). The condition without the taps at the elbow clearly

shows that after the first battery of stimuli we perceive taps at the wrist. So, one should expect that at the moment of presentation of the following battiers of stimuli the resulting perceptual experience *coheres* with the perception that has been unfolding until the instant before. It is strange that the extensionalist is happy that in the second condition the overall perceptual experience is *e*:[taps at wrist-mislocalised taps- taps closer to the elbow]. The perceptual experience *e'*:[taps at wrist – no taps – taps closer to the elbow] should be the most natural upshot in the second condition.

To close this section, it is worth to point out to other phenomena that clearly breach the mirroring principles. These are the recalibration processes that happens between the elaboration of stimuli in different modalities. It is well known that audition takes less time to elaborate its stimuli than vision (Pöppel 1997). Let us assume that we *veridically* perceive a tone as being simultaneous to a flash. If *Minimal Delay* is in play, then we should perceive the tone to be prior to the flash. And this is not the case (Viera 2019)[96].

3.2.6 Extensionalism: in between Stalin's regime and a too liberal Dualism

We have seen how the ultimate goal by Phillips (2014a) is to avoid the Stalinesque account of postdiction (section 2.2.1), according to which there is a sub-personal manipulation of the stimuli such that the presentation of the following stimulus may affect the presentation of the previously presented stimulus. The Stalinesque strategy for postdiction is *costly*. In one version it implies that the elaboration of the first stimulus is long enough in order to be affected by the elaboration of the second stimulus. This has been accused of implausibility. Arstila (2016b) rightly points out that in order to have this revision, the second stimulus should reach the cortex in order to affect the elaboration of the first stimulus. Thus, at the minimum, the first stimulus should be elaborated for an amount of time which encompasses the interstimuli interval

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[96] Viera (2019) also refers to a theoretical model by Cai a*t al* (2012) based on nodes of activations. In this model the perceptive content representing simultaneity would be the weighted sum of the activity of some neural nodes which are each sensitive on the possible temporal orders between the two (i.e. "a before b" and "b before a"). Since the activity goes in parallel, mirroring is violated. The most interesting point is that it is does not require delayed contents for recalibration.

(up to 200ms), the time for the complete transduction of the information of the second stimulus and its arrival to the cortex. Moreover, also the second stimulus itself requires time to be elaborated. The estimation by Arstila (2016b: 349) is that we become conscious of motion 345ms after the second stimulus is given[97].   If such estimation is right, then the Stalinesque delay comes to be implausible from an evolutionary perspective: we would be able to perceive, and react to, motion more than half a second (345ms+200ms) after that an object (such as a predator for instance) starts moving[98]. Moreover, if the NonLInear Latency view is in play, the theretical issues about multimodality we addressed in section 2.2.2 comes back again[99]. Given these unpalatable results, it is not surprise that an extensionalist like Phillips tries an alternative route.

The Stalinesque strategy is one of two standard options for a BrainTime view in respect to postidictive phenomena. The other option is the Orwellian Rewriting, which is not available for the Extensionalist. Indeed, according to the Orwellian Rewriting, in the case of *Phi* phenomenon, let us say, we consciously perceive the first stimulus, then the white screen and finally the motion plus the second dot. The motion experience replaces the former perceptual experience of the white screen (either by erasing the memory of it, or by impairing our reports). This strategy violates *structural mirroring:* the bit of content representing motion would not coincide with any realiser[100]. The Extensionalist apt to go Orwellian can claim that perceptual experience still unfolds following the mirroring constraints. We experience no motions, but the judgments are based on false memories[101]. The obvious concern is that now it seems that our

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[97] And this already conflict with the estimations by the endorsers of this account, namely Rao, Eagleman and Seijnowski (2001). Eagleman and Seijnowski 2000, who put the delay between 80 and 100ms.

[98] Please notice that Grush 2005b makes the same remarks for even shorter estimations.

[99] And if what I said in 2.2.2 is correct, probably neither the NonLinear Latency is immune to costly delays of some sort.

[100] One may hold that actually one act the first dot, the white screen, motion and the final dot, and they are all realised by different realisers in the brain. But this would violate PPC, since the reported duration of the overall act does not include the white screen.

[101] This is closer to what Dennett (1991) actually says, for he presents the Orwellian Strategy as involving memory. However, at the time Dennett writes there was no a sharp distinction between memory theory vs retentionalism. Moreover this is a distinction that he probably would reject since part of his powerful idea is that there is no a line where perceptual contents end and memory begins. Surely Dennett's remark would deserve much more discussion. For now, I think that formulating the Orwellian Strategy in terms of successive perceptions, rather than involving memory is much more faithful to how the debate is currently framed. Many thanks to Simon Prosser for pushing me to better explain this point.

perceptual judgements are not based on perceptual contents but on memory contents, inflating the number of cognitive mechanisms responsible for judgments. This has also the drawbacks to make it mysterious what extensional contents are for: a memory theory would have all the explicatory powers of extensionalism in respect to grounding judgments, making sense of apparent motion and delivering contents to downstream elaborations, without assuming extended perceptual experiences in addition to the work of memory.

Thus, the Extensionalist is in front of a dilemma with postdictive phenomena. Either she has to embrace a costly Stalinesque Braintime view or, she has to reject the Braintime View in favour of a Time Marker view (section 1.2). However, this latter proposal comes to be at odds with a physicalistic interpretation of conscious experience, since it drops the idea that the time of the act of perception is the same of the vehicle/realiser. Indeed, if we think that the temporal properties of the realisers are distinct from those of the conscious experience, then it is hard to deny the dualistic implications of this view. If not located at the time of the realiser, the act must be located somewhere else in time. But if so, there is no obvious physical candidate to share the same temporal location with, and it seems that our perceptual acts come to be free floating.

Therefore, the first conclusion is that Extensionalism (in every form) is committed to an unpalatable trade off: either 1) it becomes metaphysically more demanding, by being explicit dualistic, and this solves the plausibility of the Extensionalist Braintime View, or 2) it formulates his theory in a more metaphysically neutral way (by accommodating also physicalism), but this brings about the costs of the various Stalinesque strategies.

A physicalist extensionalist may try to follow Hoerl (2015) and deny the phenomenology of the *postidictive phenomena* in the first place. But this is not enough: the dualistic implications of Extensionalism can be also pointed out in respect that, in the end, Extensionalism treats perceptual experiences as processes. Treanor (2018) makes it the case that if physicalism is true, then conscious experience in general cannot be process like. This because, according to Treanor an experience of continuous pain, for example, is qualitatively homogeneous down to instants, while the neural processes are not. So, the two cannot be identical. Probably a Treanor-like argument can be

advanced against Extensionalism in respect to persistence: the visual experience of an object resting is qualitatively homogeneous down to instants, while the realisers are not. So, the two cannot be identical.

Tacking Stock. We discussed Extensionalism in depth. Despite of looking like very attractive views, in which the phenomenology of t-events is delivered with simplicity, both the Naïve View and the Overlap Model seem to be committed to very extravagant metaphysical assumptions in order to work. This is especially true when they are challenged on the basis of the temporal illusions widespread in the empirical literature. In order to avoid the problems of the Stalinesque Strategy, Extensionalism is committed to Dualism.

3.3 The Retentional Theory

The last group of specious present theories we are about to assess is composed by those theories that accept the *Principle of Simultaneous Awareness* (PSA) and reject the *Principle of Presentational Concurrence* (PPC). The Retentional Theory relies on the assumption that contents from the past in respect of perceptual experience's temporal location are *retained.* Contents are presented to an act of perception presenting us along with contents occurring now. Thus, at the minimum, all forms of Retentionalism share the following two common features:

1) The contents of perception are temporally extended
2) The vehicles of perception are momentary (in the sense explained in section 1.6. *i.e.* the briefest possible, approximately momentary).

Claim 1), is on a par with Extensionalism, the claim that the specious present is in play. Claim 2) is the distinguishing feature of Retentionalism, namely the idea that momentary vehicles of perceptual experience realise simultaneous contents from different temporal locations. In other words, *PSA*.

Traditionally, Retentionalism goes with a Representationalist conception of perceptual experience. It is easy to show why: the temporal properties of the single acts of perception are dramatically *different* from those of their contents. PPC is rejected, since the duration presented in the content is significantly longer than the perception

itself. There is no *Structural Mirroring* between content and vehicle (section 1.7). Since, traditionally Representationalists rely on this dramatic difference between properties of the vehicles and of the contents[102], it is no surprise that sometimes it is referred to as the representationalist or intentionalist theory (for example by Hoerl 2013). However, this may be misleading, since also other theories of perception, like some form of *sense data* theories, accept the difference between properties of the vehicle and content's (Crane and French 2017). That is why I avoided (and I keep on avoiding) the labels 'Representationalism' and 'Intentionalism' to refer to Retentionalism. Moreover, the theory I am about to defend is compatible with Naive Realism, which is traditionally taken to be the natural companion of Extensionalism (Hoerl 2017a).

It is sometimes claimed (for example by Phillips 2010) that the acceptance of PSA brings about the idea that a succession of perceptions is neither *necessary* nor *sufficient* for a perception of succession. This is strictly speaking true, since a single momentary act may contain change (see also section 1.5). However, a superficial interpretation of this claim may make the Retentionalist Theory similar to what Rashbrook-Cooper (2013) calls the *Completion Model* (section 3.2.4)*:* the idea that change, duration and persistence can be perceived only when they are fully occurred in the past. This is true only in dependence on two factors. Namely 1) the duration of the change itself. 2) whether our perception includes a conscious *anticipation* of contents (the so-called *protention*). Let us consider the t-event of change. If the change in question is longer than the specious present, then, of course, the Retentionalist Theory can be a Completion Model only by putting attention on a significant part of the t-event: the idea is that every perceived t-event's part can be perceived only when it has already occurred[103]. If we, as philosophers, take into account a change which is shorter than the specious present, then we may assume that Retentionalism is a Completion Model only by ruling out *protentions* from the board. Strictly speaking, if protentions are in play, our perceptual experience presents us with change *before* it is actually completed. Given

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[102] I will argue in chapter 4, that this is not straightforwardly the case.
[103] I point this out because some like Pelczar (2010a) really takes the whole t-event to be perceived only at once.

these rather trivial considerations, it is ungenerous to take the Retentionalist Theory to be a full-blown *completion model*[104].

The next two sections will be devoted to explain the general characters of the Retentionalist Theory, especially according to the two features that make it different from the extensional account: the way in which it reaches diachronic unity (section 3.3.1), and the way in which it accounts for long t-events in relation to the retentional stream (section 3.3.2). In doing so, we will present also some problems that arise with this account. I will close by sketching the main divide between the Retentionalist Theory: the dichotomy between Tense and Tenseless Retentionalism (section 3.3.3).

3.3.1 PSA and its problems

As we saw in section 1.6, the Principle of Simultaneous Awareness is the idea that being presented to a momentary vehicle of perception, is what brings about diachronic unity. According to the full-blown Retentionalist perspective, the answer to the question of how the retentionalist specious present is generated is very simple: it is necessary and sufficient[105] for the unification that contents are *simultaneously* realised. The simultaneous realisation of the content is given in this view by the "momentariness" of the vehicle relatively to contents at different times. That is to say, contents must *a fortiori* be realised together in a simultaneous manner.

Just to make a little analogy with space perception, we are able to perceive the window to be right to the blackboard, because *both* the window *and* the blackboard are presented to the same perceptual act. This enables us to perceive the spatial relation between the two. According to the *relational principle* indeed, both *relata* must be in place to perceive the relation. The case of diachronic unity should be analogous: we perceive the movement of the ball, by entertaining different contents about the ball's location at different instants. Thus change, succession and duration, which are indeed cross-temporal relations, can be the object of an instantaneous mental state in the same manner.

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[104] A point Rashbrook-Cooper (2013) himself is after in his paper.

[105] Please notice that now we are taking PSA to be both necessary and sufficient for unification. For the dialectic it was more useful to treat it just as necessary: since it is what Extensionalists argue against. I adhere to this doctrine, even though another Retentionalist may take PSA to be just necessary, rather than necessary and sufficient.

However, an obvious difficulty arises in respect to this picture. We may call it *the problem of the chord.* In the spatial case the objects standing in some spatial relation to the simultaneously given contents are indeed perceivedd as *simultaneous.* The window and the blackboard are both occurring at the same instant, in the present, and a momentary act of perception can capture them both. Things seem different in the case of the diachronic unity case. Let us take a simple mid-tempo *arpeggio,* A-C-E played by a guitarist. Let us assume that the specious present is able to encompass all tones. Thus, the guitar player actually plays A, then she plays C, and finally E, and we are able to grasp them all within a single perceptual act. If it is true that all contents simultaneously given to the same act are represented as being simultaneous, then it follows that the tones are perceived as occurring at the same instant. The result is the perception of an Aminor *chord* instead of the *arpeggio.* Thus, a theory accepting PSA must respond to the challenge of giving an account of why contents simultaneously realised are not perceived as simultaneous.

The second objection to the endorsement of the Principle of Simultaneous Awareness is the problem of the "*Law of Experience*" b Pelczar (2014. He attacks the conjunction of philosophical materialism and PSA[106]. The objection is made on the basis of a physically possible reversal of our laws. His starting point is the widely accepted[107] idea that everything in physics can be reversible in respect to Time, Space and Electron Charges[108]. That is to say, it would be possible to create a world, Unworld, in which events are the exact symmetrical of those happening in the actual world. Thus, they happen in reversal time order, in a spatial location mirroring the actual one and the subatomic particles have the opposite charge. If in our world I have the visual experience of a pendulum, moving from position A, to position B, to position C and then back from position C to position B to Position A.

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[106] It is curious that Pelczar (2014) conceived this objection as a charge to the Overlap Model. However, Dainton (2014b) rightly points out that it is an objection to retentionalism as well.

[107] Simon Prosser points out to me that actually there is also disagreement in Physics about the acceptance of the Time, Space, Charge invariance. So, the starting point by Pelczar isless establibed in respect to how he advertises it. This makes the point by Pelczar even less convincing.

[108] This tracks the difference between Newtonian and Contemporary Physics. The latter is not reversible if not by taking into account all space, time and charge.

Therefore, given Unworld's time symmetry, we may assume that we undergo four different perceptions here *e1:*[A-B], *e2;*[B-C], *e3*[C-B], *e4:*[B-A]. If materialism were true, these perceptions should be spatio-temporal entities played *reversely* in Unworld. Thus, these perceptions occur in this order: *e4:*[B-A], *e3:*[C-B], *e2:*[B-C], *e1:*[A-B]. What is important here is that contents within one perception cannot be inverted if we assume, as PSA suggests, that more than one content is given by the same vehicle. Otherwise *e4* would be no more identical to itself (it would be identical to *e1*). Thus, in Unworld, what we should perceive is the sequence "B-A-C-B-C-A-B". If both physicalism and PSA were true in Unworld, people would not have incoherent perception in respect to the physical laws governing Unworld (in which the pendulum would have a movement analogous to the one in our world). In other words, inhabitants of Unworld cannot interpret their own perceptions as presenting things conforming to our and Unworld's laws of physics.

Thus, taking stock, PSA is a neat way to generate a Specious Present, which is a good solution of the Paradox of Temporal Experience. However, it brings about the problem of the chord. Moreover, a materialistic retentionalist, like myself, also faces the problem of the *Law of Experience.*

3.3.2 The retentionalist stream and its problems.

As the main competitor of Extensionalism, it is no surprise that, *prima facie,* Retentionalism faces the opposite problems of its rival: it has a neat account of how to make sense of diachronic unity in the single act, since PSA is fully in place, but it struggle more with the account of the continuity of the *represented* in case of t-events outstripping the length of the specious present (namely the majority of the t-events we perceive). Extensionalists try in the end to exploit the extension of the acts of perception to both guarantee the continuity of the represented for long t-events and provide an account of the continuity of the stream itself (see section 1.4 and 3.2). Retentionalists cannot obviously adopt this strategy, since they are committed to momentary acts of perception. But this also mean that adjacent specious presents are not obviously connected like in an extensional stream. The challenge comes to be how to account for

a stream, or a sequence of perceptions, that is able to guarantee the perception of t-events for a longer period than the specious present itself.

Prima facie, the simplest retentionalist stream should take the following form, suggested by Rashbrook-Cooper (2017). Let us assume that we are experiencing a sequence of tones, A-B-C-D. This continuous perception can be the product of two specious presents: one encompassing A and B, and the other encompassing C and D (fig 10):

Fig.10 Simple Retentionalist Stream
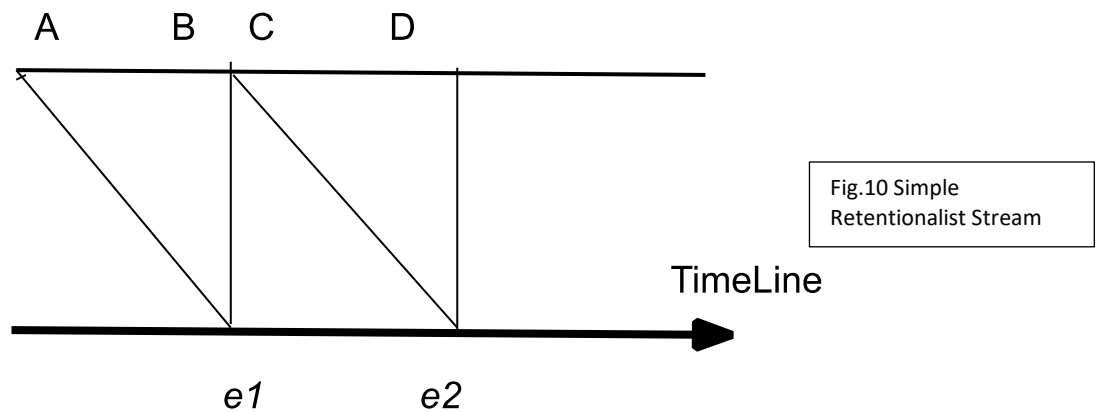
In this structure, which we may call *the simple model,* the two adjacent specious presents *do not* overlap. The obvious objection to this theory is that, if there is no overlap between two adjacent specious presents, we cannot perceive the connections between successive bits of contents falling within two specious presents, namely between B and C. This pushes many retentionalists to find a solution to the problem of how *unify* adjacent specious presents.

Admittedly, in accounting for the composition of the stream at this point, retentionalists can be very bizarre. We may have a retentionalist version of the One Experience view (Tye 2003)[109], according to which a NonExperiential part strategy produces a whole simple perceptual experience, lasting as long as our wake. Since this perceptual experience is simple, and metaphysically prior in respect to the parts, it is the only candidate available for enabling action. But this means that, for example, contents about my coffee in the morning are available to the action as long with

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[109] Tye (2003) does not explicitly endorses PSA, but he notoriously claims that the order of the represented does not necessarily reflects the order of the vehicle. A thesis that does not fit Extensionalism.

contents representing that *now* is 5.00 PM. As Bayne (2010) rightly suggests, this is implausible.

Then we have Kiverstein's (2010) proposal, according to which each retention does not present us merely with past contents, but we retain the whole previous acts. This renders possible the phenomenal connection between adjacent specious presents, since the whole past specious present is part of the new one. However, as Kiverstein himself explains, this means that all the contents retained in the old act of perception occur in the new one. Thus, the new specious present retains the whole old specious present, which retains the whole previous specious present and so on, and so forth. The result is, once again, that at the present moment, you experience everything you have been experiencing since you woke up.

The true radicalisation of this position is however by Pelczar (2010a), who explicitly endorses a kind of Idealism. He writes:

> "I not suggesting that it is an illusion that my conscious life includes the various experiences that I ordinarily think of as having occurred in me in the past.
>
> The suggestion is just that it is an illusion that these experiences occurred in the past. All (or at least, very many) of the conscious experiences that I ordinarily take to have occurred in me (or to be going to occur in me) do occur in me; it is just that they occur in me all at once." (Pelczar 2010a:60)

Pelczar is really committed to the idea that all our stream is presented in at the present moment. And please note that he speaks not only about perceptual experience but of experiences *tout court.*

In order to avoid such metaphysical oddities, which all imply that a huge amount of contents is simultaneously presented to the subject (or that all the stream occurs at once), the retentionalist has two options. Either she has to deny that we do feel the connection of adjacent contents in adjacent specious presents and so gaps between the contents *get unnoticed;* or she has to drop the *simple model*.

The first proposal should work under the assumption that gaps in adjacent specious presents are too short to be noticed. It may be the case that since we are perceiving "A before B" and "C before D", then we are simply misled to assume that there is a connection between B and C, which is not really perceived. Whilst I take this to be a viable option, I would not go this way. This because I take perceptual experience to be somehow connected to action. perceptual contents about the environment should be available to the subject to properly behave. As the figure (10) above suggests, this proposal implies that a distinct amount of time has to elapse between two adjacent acts of perception. This amount of time increases the longer the specious present is. But this can mean that if the specious present is significantly long, the new perceptual may be generated with a remarkable delay in respect to the previous one. Therefore, if something requiring a peculiar action happens in between, the perception is not yet available. The alternative is to shrink the specious present, in order to have two successive perceptions to be remarkably close in time. But this makes the proposal less attractive, since the we have a higher number of neglected changes. Finally, the stream in this view is necessarily discontinuous, since there must be always an interval between two adjacent acts. A neutral position on the objective continuity of the stream is preferable.

For these reasons, it is useful to consider dropping the *simple model*. The retentionalist assumes that between two specious presents, there is another one sharing parts of the content with both. Like in the following figure (fig.11):


Fig.11. Moving Window
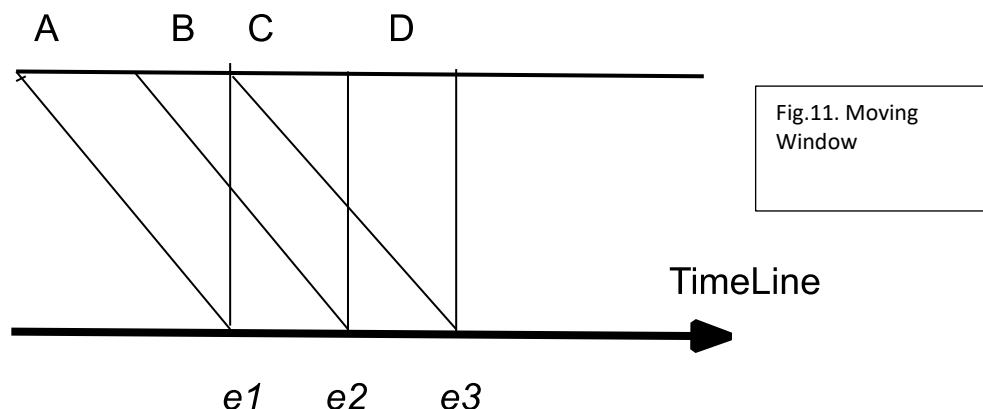
As the figure shows, the contents of adjacent perceptions overlap. This reminds a "*moving window*" presenting the subject at different instants with a new specious

present having many contents in common with the previous one (and eventually the following ones) (cf. Grush 2005a, 2005b, 2007). However, this is a different kind of overlap in respect to Dainton's theory, in which numerically identical parts of perception are shared by different specious presents. Here perceptions are isolated one from another. It is just a part of the content that is shared between two adjacent specious presents.

A little advantage of the *Moving Window* model is that it can be compatible with both a continuous and a discontinuous conception of the stream. In a continuous conception, an objective interval is filled with these experiential acts, such that there are no gaps in between. Gaps may be there, but they obviously go unnoticed since the vehicle after the gap still share a great amount of content with the vehicle before the gap.

The most discussed objections in literature to Retentionalism are directed to the *Moving Window* version of it. These are three distinct problems that comes to be often conflated: the *Surplus Content* (Dainton 2018, but also Rashbrook-Cooper 2017), the *Ballooning Content* (Dainton 2000) and the *Stuttering* (Dainton 2000, 2008, 2014b, Pelczar 2014, Chuard 2017). We may refer to them as the *streamal problems.*

The *Surplus Content* is the simplest one. Let us assume that we perceive an instantaneous flash at *t1*. This enters in different specious presents, for the example, it is included in the contents of acts *e2* and *e3* which, taken together, last for an interval *dt*. Thus, a subject perceives a certain item for a much longer duration than its actual one (fig.12):

Fig.12 The Surplus Content

TimeLine

e1   *(t)*   *e2*   *e3*

dt
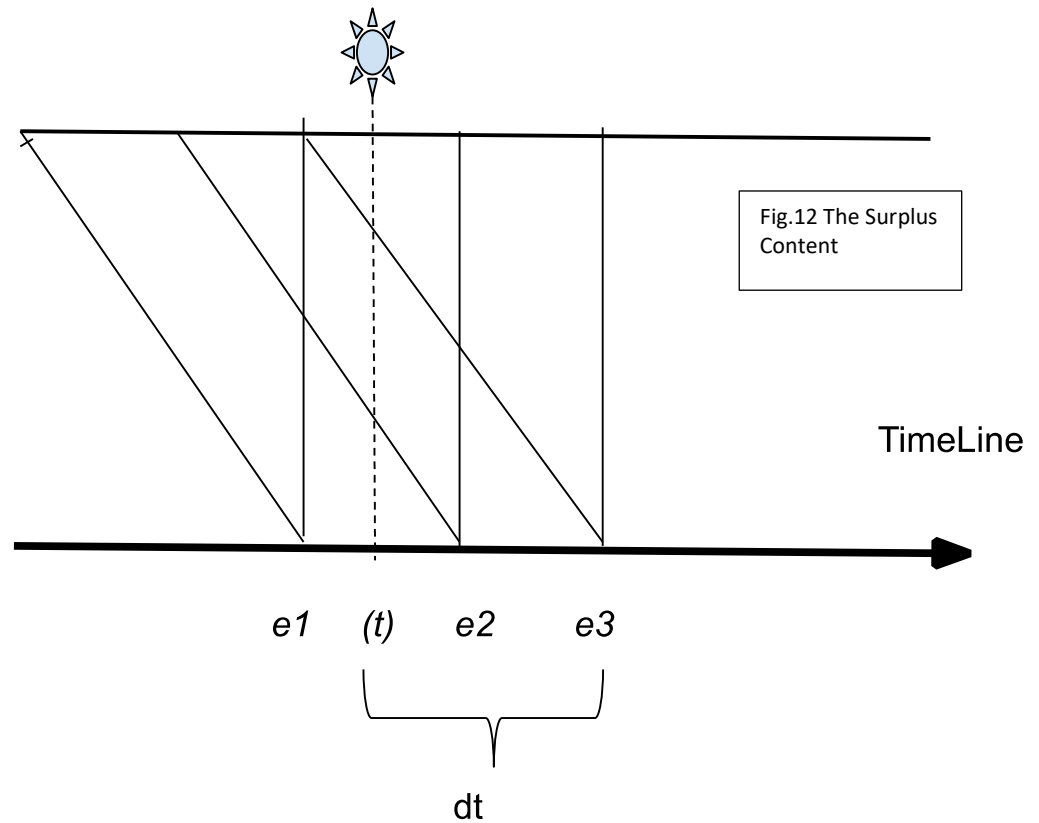
This may impact on the effectivity of our judgments of what is going on now, since it should be perceived as-*present* throughout the temporal interval *dt*. Actually, this can be seen as the application of the problem of the chord to the stream: contents are perceived *as-present* in every window they come in. This means that, on the one hand, the perceptual acts are a misleading base for our judgments about the duration of brief items; on the other hand, given the intimate link between action and presence, we may be disposed to perform an action toward the item after its actual occurrence (Rashbrook-Cooper 2017).

The *Ballooning Problem* is again a problem of duration perception (Dainton 2000)[110]. It is, in a sense, the converse of the *Surplus Content Problem.* Let us assume that we are perceiving a process composed by the phases A,B,C,D (see the fig.13 below). Let us take for guaranteed the retentional stream of consciousness, composed by a

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[110] This has been formulated as an objection to theory Dainton (2000) attributes to Broad (1925), who hold a theory which is a mix between Retentionalism and Extensionalism. Here I am exploring the effects of this objection to Retentionalism, without claiming that Dainton himself sees this as an objection to Retentionalism.

sequence of momentary acts. Let us consider an *interval dt,* which, we may assume, is filled by this series of instantaneous acts encompassing different specious presents each. Finally, we can consider a wider interval *dt',* which is the sum of *dt* plus another duration filled by other acts (thus *dt'* includes *dt*). The resulting structure is the following (fig.13):
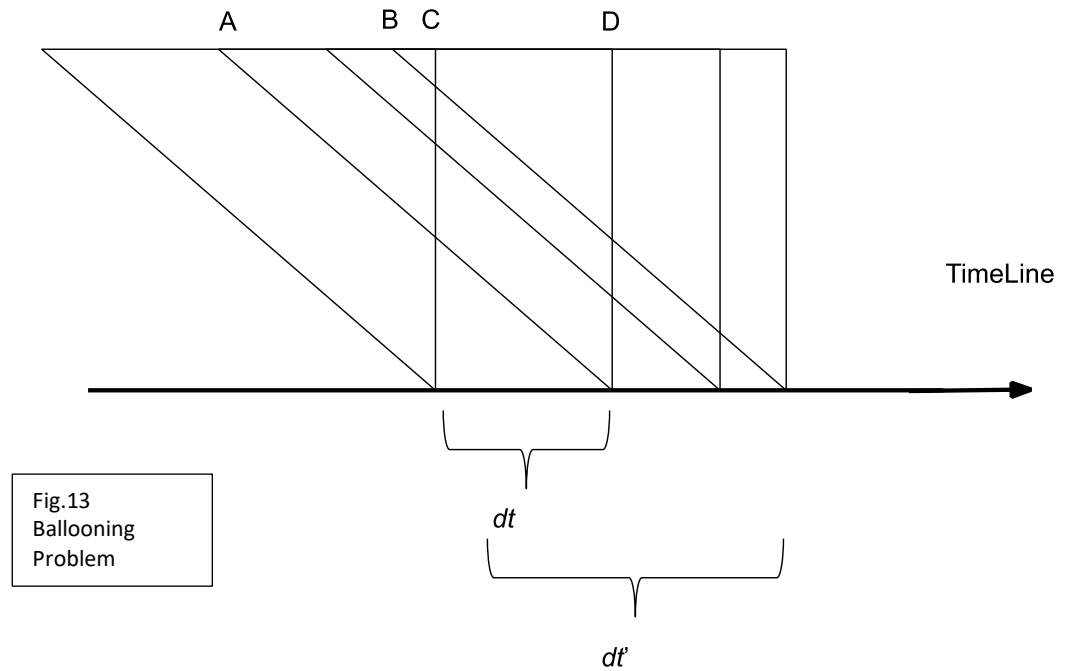
Fig.13
Ballooning
Problem

The Ballooning Problem arises from the fact that, as the figure shows, during *dt* the shared content ecompasses phases *A* to *D.* So, it seems that during *dt* we are aware of a quite long duration (A-D). By contrast the portion of the process I am aware of during *dt'* shrinks: the shared contents I am aware of encompass only *B-C.* So, it seems that during a longer duration we are aware of a shorter duration of the process. According to Dainton (2000) this is phenomenologically odd: we do not perceive such a difference according to which the longer we are presented with a process, the shorter is the part of the process we are presented with.

The last of the streamal problems is the *Stuttering Problem* (also known as the *Problem of Repeated Contents),* whose best formulation is by Pelczar (2014). Let us assume again that we are perceiving a guitar player performing a solo. This time he plays rapidly the descending E minor pentatonic scale in straight *sixtinths*, i.e sixtinths of equal length: "E,D,B,A,G,E". Let us suppose for simplicity that our specious present

encompasses two tones. Thus, the interpretation based on the *simple model* of what is going on here is that we have three acts: *e1*:[E-D] *e2*: [B-A], *e3*:[G-E]. (fig.14)

Fig.14. Simple Model
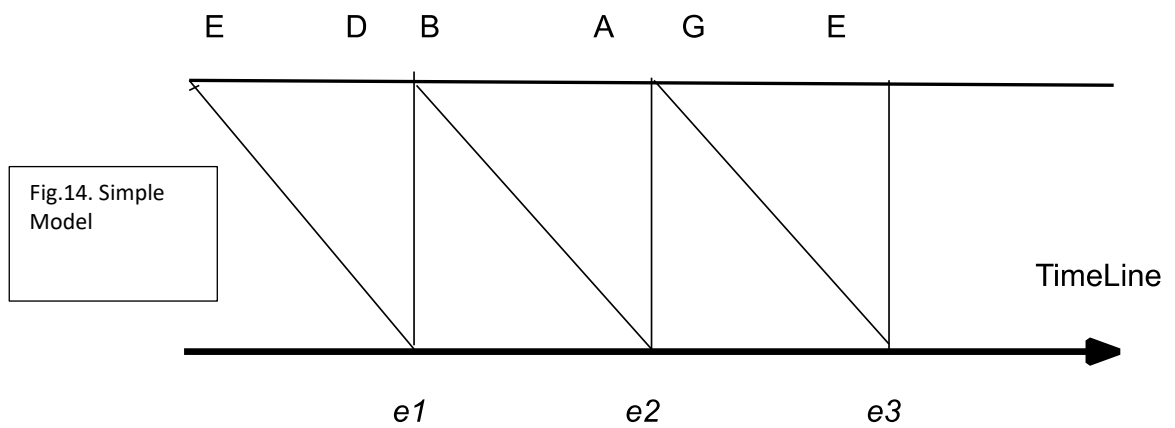
But, as we know, if the contents of *e1,e2,e3* are experientially isolated, it seems that what we perceive is just the transitions from E to D, from B to A, from G to E. For example, the passage from D to B comes to be neglected, unless we do allow for a phenomenal overlap between contents of adjacent windows. That is to say, we should opt for the *moving window.* Thus, we may now have five acts, whose contents partially overlap. Thus *e1*:[E-D], *e1'*:[D-B], *e2*:[B-A], *e2'*:[A-G], *e3*:[G-E] (fig.15):

Fig.15: Moving Window
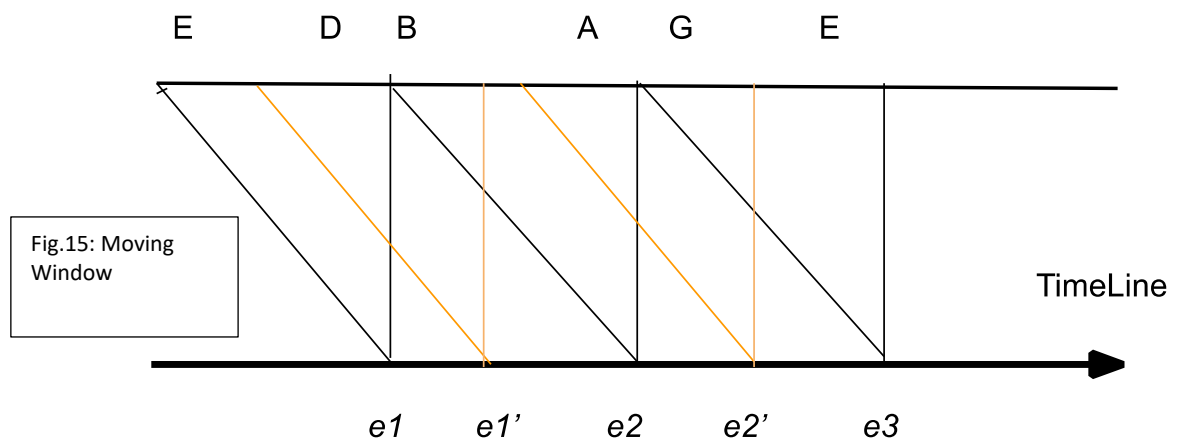
Dainton (2014b) and Pelczar (2014) find two (sub)problems with this. The first one is that it seems that what is *present* to us is the sequence of tones "E-D-D-B-B-A-A-G-G-E", which is a very different, "stuttered" melody in respect to what the soloist played (E-D-B-A-G-E). The second difficulty is about the fact that the problem starts

again. Now, we need to connect the specious presents of the new adjacent acts, which are not phenomenally connected. Thus, we should pose further windows: *e1*:[E-D], *e1"*[D-D], *e1'*:[D-B], *e2"*: [B-B], *e2*:[B-A], *e2'''*:[A-A] *e2'*:[A-G], *e3'*[G-G] *e3*:[G-E]. This second difficulty yields an *infinite regress*: we have to provide again a phenomenal connection of adjacent windows and, in addition, the sequence of perceived tones is different again (E-D-D-D-D-B-B-B-B-A-A-A-A-G-G-G-G-E).

Taking stock, the objections to Retentionalism target either the possible bad outcomes of the acceptance of PSA, or the oddity generated by the retentional stream. In order to avoid the difficulties posed by the *simple* retentional model*, the *Moving Window* assumes that adjacent contents are overlapping in character. However, accepting both PSA and overlaps brings about the problems of *Surplus Content, Ballooning* and *Stuttering.* I gave some reasons throughout this section to avoid the *simple model,* thus my strategy in the next chapter would be to endorse a *moving window* conception and provide solutions to these problems. Thus, from here on, we should assume that a *moving window* conception is in play. In the next section I will give a quick overview on the main divide among retentionalists, namely the one about tense contents.

3.3.3 Tense and Tenseless Retentionalism

Broadly speaking there are two main strands of Retentionalism: the Tense version of Retentionalism and the Tenseless version of Retentionalism. As their name suggests, the difference concerns the possible occurrence of indexicals or tenses in our contents. According to the former position, perception represents contents as happening *now, as-being present* (or as enjoying some other tense property). According to Tenseless Retentionalism, t-events are presented to us *simpliciter*, with no temporal connotation. Of course, as we will see in the next chapter, the two retentionalist versions account for the problems affecting PSA (*chord, law of experience*) and the streamal problems (*surplus, ballooning, stuttering*) differently.

Some clarificatory points on Tense Retentionalism are required. Firstly, the presence of indexes or tenses makes Tense Retentionalism committed to

representational contents, which are traditionally considered the only kind of contents with accuracy conditions upon which the tenses and indexes may have an impact[111]. The thought is that tenses require a semantical evaluation, which is guaranteed only by representationalism. Secondly, within the representationalist camp there is a divide between people assuming that the properties of the contents are sufficient to capture the phenomenology of what we are perceiving (Tye 2002a), and those who claim that also the property of the vehicle matters (Crane 2009). Tense Retentionalism has an analogous divide. Everybody agrees on the fact that ultimately the tense or the index is a property of the vehicle, but there is disagreement on whether this has to be thought as a *mode of presentation of the content* (cf. Almäng 2012), or as a *modification of the vehicle itself[112]*. We can intuitively track the distinction by noticing that in the first case the vehicle/object structure is so configured: "*representing that X is present*", while in the second case the structure of our perceptual experience comes to be "*representing-as-present that X*"[113].

However, there is no doubt that the first structure is preferable. To see why, let us notice that in both structures the problem of the chord is in place: if all the contents within the specious present are felt as *present,* one should conclude that they are *equally* present, and thus that the relations among the perceived phases of a t-event get neglected (cf. Almäng 2012). The content-based Tense Retentionalist can simply provide a more refined analysis of the content to avoid the problem. He may indeed insert more than one index or mode of presentation in the content in order to give the specious present a structure. In this way, as Almäng (2014) suggests, in each specious present we perceive certain contents *as-past,* certain others *as-present,* others *as-futures.* And the problem of the chord is easily solved (more on this in section 4.6). The same move is not available to the proponents of the modification of the act, since having the index as a modification of the act still affects the *whole experiential content*: all the specious present would be felt, for example, as both present and past.

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[111] This assuming that tenses are not A-properties, in that case it is not straightforward that naive-realism or other theories of perceptions are not in place. However I will provide reasons why A-properties cannot be perceived in chapter 5.

[112] The idea may be flashed out by denying *à la* Millikan (1991) that indexes are part of the representation proper, they are resolved by the functional role of the vehicle.

[113] I am taking into account a Kriegel (2015) *inspired* Retentionalist Theory. Kriegel himself is concerned with what he calls "temporal orientation" rather than the perception of t-events.

With this brief introduction on Tense and Tenseless Retentionalism, we have closed the third chapter. The development of my own account is about to come.

APPENDIX3: Some Other Empirical Findings.

In this appendix, we will focus on some empirical findings that are often quoted in literature but, in the end, have no a resolutive impact on the debate. Firstly, we will have a look at the measure of the upper-bound of the specious present. It is unclear whether the measure discloses truths on perception alone. Secondly, we will have a look at the Phillips/Watzl debate about the motion silencing: since two interpretations are available, the motion silencing does speak neither in favour nor against Extensionalism.

The upper bound, i.e. the maximal span of the specious present, has been estimated to be between 2 and 3s, thanks to experiments showing that people automatically group together auditory clicks separated by 3s at most. In such trials people impose to uniform clicks a "temporal structure" such that they perceive the first click as "stressed" and the next two or three as uniform. This phenomenon breaks down over 3s. Other evidence about multimodal integration up to 3s derives from the fact that when people are asked to tap with their fingers following the clicks, they are still able to do it up to 3s. The same estimation results from tasks where people are told to tap with the finger as slow as they can: they do it within 2-3s range. Thus, this span allows people to get control over their actions. Moreover, the disambiguation of figures like the Necker Cube[114] change every 3 seconds. Finally, temporal judgments about stimuli durations are accurate up to 3s. After that point people performance starts decreasing quickly (Pöppel 1997; Wittmann 2016).

It is very tempting to take this estimation to be correspondent to the maximal length of the specious present, however we should be very cautious in doing this move. The Ratio between the acceptance of the specious present is simply our ability to perceive t-events: so, a minimal duration is required, but nothing is said about the maximal duration. It is undoubtful that actions are reliably guided by integrations up to

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[114] The Necker Cube: https://www.youtube.com/watch?v=fEN8YAXdOak

3seconds, but since these experiments point out to abilities like grouping and judgment estimations, it is unclear whether other capacities are in place here.

The *motion silencing effect* has been imported into the philosophical debate by Watzl (2013), who takes it to be a direct counter-example to *Metrical Mirroring,* namely the cornerstone of Extensionalism[115]. The experiment carried out by Suchow and Alvarez (2011) consists in a presenting the participants with a ring, composed by 100 coloured dots. Every dot continuously changes colour. Subjects are asked to fix the centre of the ring, while paying attention to the colour changes among the dots. Changes are progressive, the colour red changes from dot to dot, all the way down through the ring. The change rate can be interpreted as being the angular distance that a colour covers on the wheel per unit of time (thus it is measured in degrees per second)[116]. Objectively speaking, these changes happens in *every experimental condition with the same change rate.* Indeed, there are two of such conditions: 1) *the stationary condition,* in which the ring as a whole does not move and 2) *The rotation condition,* in which the whole ring moves. Thus, in condition 1) only colours change at a certain rate. In condition 2) the ring entirely moves and we still have change in dot colours *with the very same rate*.

The illusion can be described by contrasting the two conditions. In the stationary conditions subjects clearly report to see the change in dot colours. However, in the rotation condition the perception is different. The colour change is felt as much slower and – this is the most important point here – the perceived rate at which dots change is inversely proportional to the speed of the ring. The faster the ring, the slower the perceived change in colour is, until an ideal stop change after a certain ring-speed.

Watzl (2013) interprets this data to give support to a pair of principles that are jointly incompatible with the *Mirroring Thesis.* The first one is called by the author *Different Temporal Content.* It is simply the idea that the perceived change in the rotation condition is much slower than in the stationary condition. In other words: it is

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[115] I strongly recommend the reader to watch the illusion at one of the following links:
http://visionlab.harvard.edu/silencing/
https://michaelbach.de/ot/mot-silencing/index.html
[116] Actually, this is not a real measure of movement, since dots move only when the ring moves. It measures the speed of *change* in colours.

the expression of the illusion. The second one is called the *Same Temporal Layout*, our perceptual acts change with the same rate in both conditions. Please notice that the emphasis here in the Same Temporal Layout is on the change *in the vehicle*, not in content. The reason why *Metrical Mirroring* is violated is simple: there is a mismatch between the change rate in content and the change rate in the vehicle between the two conditions. Indeed, whilst the change rate of the vehicle is the same in the two conditions, the content rates changes. So, in one of the two conditions the content cannot be isomorphic to the vehicle. In other words, *Structural Mirroring,* the principle according to which to a change in the vehicle corresponds a change in content, is violated in one of the two conditions (section 1.6.1). Thus, independently on whether we are willing to characterise the stationary condition or the rotating condition as the one in which the isomorphism holds, the other condition shows a case in which the isomorphism breaks down.

Whilst *Different Temporal Content* should be uncontroversial, since it is the datum delivered by the Motion Silencing Illusion, *same temporal layout* needs much more support. Watzl (2013) relies again on some experiments by Suchow and Alvarez (2011), in which the *flip* variable is introduced. The tested hypothesis is that when the ring starts rotating, we keep representing a certain dot to have the same colour it had when the ring started its movement. Thus, if at instant *t1* in which the rotating conditions starts, a certain dot, n° 77, is colour red, then dot n°77 is represented as being red throughout the whole rotating condition, even though it changes colour in reality. At the endpoint *t2* of the rotating condition a *flip* is introduced. Thus, let us assume that a *t2*, dot n°77 is coloured yellow, after the *flip* occurred, it becomes red (his original colour) back again. The idea is that, if the hypothesis were true, people should not be able to detect the change of dot n°77 from yellow to red, since it has been represented to be red throughout the whole experiment. Thus, the prediction is that a change from illusory red to veridical red should not be perceived.

Data contradict this hypothesis: people are able to detect the flip when the change at the endpoint matches the colour the dot had "back then" (Suchow and Alvarez 2011)*.* Thus, in our example, people *succeed* to detect the flip when dot n°77 changes from yellow to red. Therefore, it cannot be the case that dot n° 77 has been represented as red throughout the experiment.

However, and this is the interesting point, what happened is exactly the opposite: the less is the angular distance between the two dots involved in the flip, the more difficult is to detect the flip. Thus, in our example, let us assume that we have got two different flips. In one flip, dot n°77 gains the colour of dot n°53, in the second flip, it gets the colour of dot n°30. Of course, the angular distance between dot n°77 and n°53 is less than the angular distance between N°77 and n°30. Data show that people tend to be more likely not to perceive the change if it is related to n°77 and n°53 (less angular distance) in respect that changes involving n°77 and n°30 (greater angular distance)[117]. This seems to suggest that our perceptions track the *actual* colours of the dots and not the colours dots had at the beginning of the rotating condition, and thus perception has to change quickly, with the same rate, in the two conditions (recall the change rate of the dots is the same in both cases)[118].

The reply by Phillips (2014b, 2014c) aims to give an alternative explanation of this phenomenon. He started by noticing that the gradual nature of silencing is peculiarly pressing for Extensionalism, since it proves that there are *misperceived* temporal properties, instead of being a case of simply lack of represented temporal properties[119]. Thus, there is an illusory content that has to be mirrored by the vehicle, since peripheral changes *are* clearly perceived up to a certain rotation speed. Then, he advances his proposal: instead of interpreting all dots as changing in colour at different perceived rates, as Suchow and Alvarez (2011) and Watzl (2013) do, one may assume that the *unsilenced dots* are veridically perceived. They are perceived as moving at the correct change rate. However, as long as the rotation speed increases, the less dots escape silencing. *Silenced dots* are not perceived as changing at all, thus, there is no illusory content of change that requires to be mirrored in the phenomenology. In particular, following Phillips (2014c), Motion Silencing can be interpreted as a

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[117] To be precise, an angle of at least 20° is required to perceive the change.

[118] Please notice that Watzl (2013) thinks that some form of deflationist models, those he dubs "holistic temporal atomism", namely Chuard-like resemblance theories, are not affected by this. Indeed, according to him, these models can account for Motion Silencing thanks to the different colour arrangements represented in each single snapshot.

[119] The idea here is that there are cases of Masked Change (for example the "Gorilla on the Background – Selective attention task" by Simons and Chabris 1999). In cases like this an Extensionalist may complain that change is not detected, thus the vehicle has no need to mirror it. (Here is the link to the famous video by Simons and Chabris https://www.youtube.com/watch?v=vJG698U2Mvo). In the case of Motion Silencing this option is not available because at intermediate rotations, the change is clearly perceived.

phenomenon of *crowding,* namely the impairment of an object recognition due to the presence of nearby objects. It usually happens in peripheral vision and with similar objects, two conditions that – as Phillips notices – occur in the case of Motion Silencing. Indeed, dots in the ring are posed to a degree angle of 5°-8° from the fixation point (the centre of the ring) and the coloured dots are similar objects. The idea is that the speed of the rotation of the ring has an effect on our perceptual abilities: the faster the ring rotates, the more dots we "crowd together". The less it rotates, the more dots escape silencing and we perceive their change at the correct location. Thus, as far as I can see, the idea by Phillips (2014b, 2014c) is to exploit the lack of information at the periphery of our visual field[120]: the dots come to be difficult to identify because they are surrounded by similar coloured dots when information about the rotating dots covers the information about dots change. Something that does not happen in the stationary condition. Therefore, Phillips goes on, in the rotating condition more and more dots are misidentified and "*even assuming that we do see the individual dot, in such situation we will be unable reliably to discriminate which colour [the dot] has, and so, if [the dot] is changing colour, to perceptually track's [dot's] colour changes over time*" (Phillips 2014c: 701). Finally, as far as the flipping is concerned, Phillips (2014b, 2014c) concludes, there is no ground to the assumption that we consciously track the actual colour of the dots throughout the experiment: it can be the case that the flipping is noticed only in the end, by taking into account how the wheel is at the moment of the stop and how it is after the flip.

In the end, since both the interpretations namely the "silencing" and the "crowding" are in place, the motion silencing does speak neither in favour nor against Extensionalism.

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[120] Compare with the end of section 3.1.2, about information loss in our visual field.

Chapter 4: A Transparent Retentionalism

The two main views in philosophy of perception, namely Representationalism and Naïve Realism are motivated by an appeal to a peculiar feature of our perceptual experience: its being *transparent or diaphanous*. The appeal to transparency usually goes along with the idea that our perceptual awareness does not encounter any nonphysical mental object like *sense-data*[121] or properties, like *qualia*. For this reason, I take it to be a *desideratum* for any theory of perception to be able to accommodate transparency.

As it should be clear indeed from the discussion in the previous chapters, I ultimately have a physicalistic perspective as a background. I share the same attitude with philosophers like Dretske (1995), Harman (1990) and Tye (1995, 2002a) about transparency: it gives reasons not to accept items, like *sense-data* or *qualia*, which are notoriously at odds with materialism in philosophy of mind. My Retentional Theory is thus an attempt to formulate a theory of perception of t-events accordingly. This goes at the heart of the issue about the perception of temporal properties: perceptual experiences are physically realised, and, as every other physical entity, they are spatio-*temporally* localised. Thus, they happen *in time* and, as it is clear from the previous discussion, all the debate within the specious present theories is all about understating how the temporal properties of the perceptual structure, or vehicle, affects the perception of temporal properties of the object in the environment.

The notion of transparency, an ally for the physicalist, has been recently extended to the debate about the perception of temporal properties of t-events. The reason why *temporal transparency* is so interesting, as we know from the introduction, is that the perceptual vehicle, especially in a physicalistic perspective, enjoy the same kind of temporal properties or the content. Order, duration, succession, simultaneity are properties that belong also to the structure of the vehicle, no matter our

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[121] Although there are interpretations of transparency which are compatible with sense-data theories. See Moore (1903) and Gow (2016) below.

understanding of what a perceptual experience is. Thus, in the case of t-events perception there can be a singular coincidence of the temporal properties constituting the phenomenal character and the temporal properties of the vehicle itself, that can be the same of the properties we encounter in our introspection, even if *negative metaphysical transparency* (the strongest reading of transparency) holds. This seems not to be true for other properties of the content, like "being-green": there is nothing in our brain that is green-coloured. More to the point, temporal properties may constrain the phenomenology of t-events even if they are neither directly, nor indirectly introspectively accessible. Indeed, it may be the case that the phenomenal character of a t-event is brought about only in virtue of an extended vehicle, or that a subject is enabled to perceive an extended sequence only because it is realised all at once in her brain.

In the next section, I will articulate the notion of transparency of perceptual experience. In section 4.2, I will be especially interested in how they are positioned in respect of the idea of tensed contents in perception. Section 4.3 will be about the formulation of the Transparency Argument against Retentionalism. In section 4.4, I will articulate the tenseless proposal by Hoerl. In section 4.5 I will be about the tense argument by Soteriou (2013). The explicit formulation of tenseless retentionalism is in section 4.6 and issues about the neural representation are in section 4.7. Section 4.8 addresses a secondary issue regarding the qualitative character of motion and change perception.

4.1 On the very notion of phenomenal transparency

The first one assessing the idea of phenomenal transparency was perhaps G.E.Moore, who writes:

> "When we try to introspect the sensation of blue, all we can see is the blue: the other element is as if it were diaphanous (1903, p.25)"

Some other, more recent, *Loci Classici* of transparency are in Harman (1990):

"Now, perhaps, Eloise's visual experience even presents a tree as seen by her, that is, as an object of her visual experience. If so, there is a sense after all in which Eloise's visual experience represents something mental: it represents objects in the world as objects of visual experience. But this does not mean that Eloise's visual experience in any way reveals to her the intrinsic properties of that experience by virtue of which it has the content it has. I want to stress this point, because it is very important. Eloise is aware of the tree as a tree that she is now seeing. So, we can suppose she is aware of some features of her current visual experience. In particular, she is aware that her visual experience has the feature of being an experience of seeing a tree. That is to be aware of an intentional feature of her experience; she is aware that her experience has a certain content. On the other hand, I want to argue that she is not aware of those intrinsic features of her experience by virtue of which it has that content. Indeed, I believe that she has no access at all to the intrinsic features of her mental representation that make it a mental representation of seeing a tree." (Herman 1990, my italics)

And Tye (1995, p.153)

"Try to focus your attention on some intrinsic feature of the experience that distinguishes it from other experience, something other than what it is an experience of. The task seems impossible: one's awareness seems always to slip through the experience to blueness and squareness, as instanced together in an external object. In turning one's mind inward to attend to the experience, one seems to end up concentrating on what is outside again, on external features or properties" (Tye 1995 my italics)

The most popular, and rather *misleading*, idea of phenomenal transparency is that when we introspect our perceptual experience of blue, we are aware of something blue. However, since our perceptual experience cannot be blue (there is nothing blue in our brain), the blueness must belong to the ocean outside. A more formal way to put the point is the following: when we undergo a certain perceptual *experience e* of a property P in the environment in which it takes place, all that your introspection reveals regarding e is P. Now, since P belongs to the environment and not to the vehicle of perception itself, it follows that all that introspection reveals of our perceptual experience are properties of the external things and not of the act or vehicle itself. For

example, when I undergo a visual experience of a blue surface – as in the quote by Moore - all I encounter in my introspection are the properties of the blue surface. My introspection is silent about anything of the visual experience *by which* I get aware of the blue surface (for example any vehicle). On the contrary: it is *because* I get aware of the properties of the blue surface over there, that I come to know *what-it-is-like* to undergo to the visual experience of a blue surface. I come to know about the phenomenal character of any perceptual experience by having access to what happens outside. That is to say, the *phenomenal character* is discovered *by* attending to the properties in the environment. As Tye (2002b) himself puts it: we do not have *direct introspective* access to what-it-is-like to perceive a thing. In other words, what is at stake here is primarily what introspection reveals of the *phenomenal character.* The corollary is that, obviously, we can be aware of what-it-is like to perceive blue, only *by* attending to the external properties. If Tye and Harman were right, transparency has to be regarded as the idea that phenomenology is constituted by *environmental, externally-located, mind-independent physical* properties or objects[122]. And by externally located we mean objects or properties that do not occur "in the skull" of the subject. These properties take place outside, in the subject's immediate environment.

Unfortunately, things are not so simple. Since Martin (2002), indeed, we know that behind phenomenal transparency there is a cluster of conflated notions that one should well keep separated. For example, Both Martin (2002: 386) and Soteriou (2013: 88) make a distinction between *positive* transparency, according to which a subject encounters external objects and properties in our sensory experience, and *negative* transparency, according to which no *qualia* or *sense-data,* i.e. pure mind-dependent properties or objects, are accessible to our introspection. Another distinction is by Amy Kind (2003), who distinguishes between *weak* and *strong* transparency. Weak

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[122] Christoph Hoerl pointed out to me that this may be a stronger claim of what these authors are prone to concede, because they take phenomenology to be constituted by the *representation* of such a thing. I disagree, since the forceful negation of "mental paint" by Harman (1990) clearly points into the direction that the property encountered in introspection is the propriety outside. This may be reflected also on the fact that people with these inclinations tends to think about contents as accuracy conditions, which are, strictly speaking, facts obtaining in the environment. It is on this point that Laura Gow (2018) claims that this kind of position collapse onto Naïve Realism. I agree with her, since I take this Externalist Representational position to be the version of Naïve Realism that admits accuracy conditions.

transparency is the negation of the negative claim: whilst it is difficult to attend to properties not belonging to the object outside in our introspection, it *is still possible to do so*. Strong transparency on the other hand is essentially the *negative claim* by Martin and Soteriou. The *positive claim* is rejected by Ned Block (2002), who holds that our introspection indeed reveals *qualia*, the "mental paint" *doing* the representing. By his light, purely mental properties are revealed in introspection, and these are only contingently related with the external properties they are supposed to represent.

Finally, the most perspicuous analysis of transparency is by Laura Gow (2016) who makes a further distinction between *phenomenological transparency* and *metaphysical transparency*. The former is the idea that our introspection reveals properties that just *seem* to belong to external objects. The second is the idea that our introspection *does reveal* only externally located properties. Both phenomenological and metaphysical transparencies can be combined with both the positive and the negative interpretations. Therefore, according to Gow (2016) the there are four notions of transparency in play. Firstly, the positive phenomenological notion, according to which the phenomenal character of the visual experience is partially constituted by an awareness of properties which *seems to be* externally located. This is compatible with the *weak* transparency by Kind, according to which, other properties *seem not* to belong to external properties, whilst they are difficult to capture. Secondly, the negative phenomenological reading is that it we are not aware of these properties *as being* internally realised. Moreover, the *metaphysical claims* come as well in a double version. According to the positive one our introspection reveals externally-located properties. Finally, according to the negative one, we are not aware of properties of the structure or vehicle.

To sum up, if this analysis is on the right track, there are at least *five* notions of transparency to disambiguate: these are the four notions that Gow derives by expanding the distinction by Martin and Soteriou and the weak notion of transparency introduced by Kind, which states that it may be difficult, but not impossible, to have access to mind-dependent properties. Finally, Kind's weak transparency is not exactly the same as the positive metaphysical claim: Kind's notion denies the truth of the negative metaphysical claim, while the positive metaphysical claim it is neutral on its truth. However, for the

very same reason, people accepting the positive metaphysical claim and denying the negative one, naturally accept Kind's weak transparency.

In the next sections, namely in dealing with the objections by Soteriou and Phillips, I will assume, at *the minimum,* that the negative *phenomenological interpretation of* transparency is true for temporal properties. This implies that, also the positive phenomenological claim must be true as well. I will take it to be a phenomenological datum, as far as t-events are concerned, that it *seems to* us that the t-events' properties we encounter in our perception *seem* to be externally located. As we will see, this is accepted by my opponents, the extensionalists (Soteriou 2010; Soteriou 2013; Phillips 2010; 2014a). They even claim that this supports their conception. When I will speak about transparency in general I will refer, without specifications, to the *negative phenomenological transparency* for temporal properties. In presenting my theory, I will show that it accommodates negative *metaphysical* transparency (and *a fortiori* all the other's Gow's notions, including the phenomenological reading). I will be silent on whether *negative phenomenological* transparency holds for other non-temporal properties.

As we will see in the next section, things get more complicated by *tensed perception* (cf. Russell 1921): the representation of tensed properties and indexes seems to go against the phenomenological datum by temporal transparency, as we are about to see in the next sections.

4.2 The Specious Present Theories and Tensed Perception

As we anticipated in section 3.3.2, in assessing Retentionalism we encountered both a tense and a tenseless version of perceptual contents. As we will see, this has a great impact on the debate about Temporal Transparency. In particular, if Tenseless Retentionalism is not viable, and negative phenomenological temporal transparency is true, then Extensionalism wins the day on accounting for our phenomenology. Much of my efforts will be devoted to Tenseless Retentionalism. However, let us spend some time to assess the debate about tensed perception (or tensed content) within a more general framework about the specious present theories, not just Retentionalism.

What is of particular interest here is the different compatibility the two theories have toward tensed perception, the idea that our perceptual contents contain tenses or indexicals referring to certain time locations. Extensionalism is traditionally considered a tenseless view of content. The reason for this claim can be seen through a *reductio* strategy shown by Hoerl (2009). Extensionalism endorses both extended contents and extended vehicle: thus let us assume that we have got a stretched vehicle *e* spanning from instants *t1,t2,t3*, and presenting contents C1,C2,C3 respectively. Let us assume *t3* at which C3 occurs is the present moment. If we introduced indexicals and tenses, we would to assume that we perceive "C3 *as happening now*", while "C2 *as happening shortly before*". The truth conditions of these contents would be *token-reflexive* (cf. Perry 2013), thus they would involve reference to the vehicle of perception itself, which, recall, spans over the whole interval *t1-t3*. It follows that content C2, actually occurring at *t2*, would have been perceived as occurring *shortly before* the time occupied by its vehicle, namely *before t1.* Thus, it would be sensed as occupying another temporal location from the one it actually occupies. On the other hand, content C3 if perceived as occurring "now", it would be perceived as occupying the same temporal location of the whole perceptual experience, thus as lasting from the whole interval *t1-t3*. These are violations of PPC, according to which the whole sequence "C1-C2-C3" should last as long as the vehicle lasts.

By rejecting PPC and assuming momentary vehicles of sensory experience, Retentionalism can admit tenses and time indexicals in perceptual contents. Indeed, in the case of an a perceptual experience realised at *t2*, presenting with contents C1-C2-C3, occurring at *t1,t2,t3* respectively, if content C1 occurring at *t1* is perceived as *slightly before* in respect to when the realiser occurs (*t2*), its temporal location is not misrepresented. And the same is true for the other time indexicals and tenses.

According to the received view, tenses and indexicals are a necessary ingredient for the Retentional Theory, *i.e.* there cannot be Tenseless Retentionalism. To see why, let us come back to the problem of the chord for PSA and the Streamal Problems for Retentionalism. Firstly, indexicals are the best option to solve *the problem of the chord* (section 3.3.2)*.* The problem is that given PSA, contents are simultaneously realised by the same momentary vehicle. Thus, it seems that contents belonging to different points

in time are perceived as occurring in the same instant. This is where indexes come to the rescue: classical retentionalists like Husserl (1928/2014)(and more recently Almäng 2014) tend to think that the specious present is *tensedly organised*. A simple way to exploit tenses can be the following: the content A may be represented *as-past*, the content "C *as-present*" and the content "E *as-future*". In this way the unfolding of the melody is secured over the sound of the chord. A Tenseless Retentionalism, on the other hand, seems to face the problem of the chord: without the ordering provided by the indexes, it comes to be harder to explain why, if both A and B are realised together, they are not perceived as simultaneous.

Moreover, the streamal problems we have assessed in section 3.3.2 are formulated against the "basic" Tenseless Retentionalist Theory. Indeed, as we noticed the *surplus content* problem is a re-edition of the problem of the chord itself. It is because the various windows do not have an internal structure that a certain content is perceived as lasting more than its actual duration. The reason is that it is perceived *as-present* for an interval of time which is longer than the temporal location it actually occupies. Thus, its perceived duration comes to be dilatated. A temporally organised content would make the temporal location of the t-event explicit to the perceiver: when the last of its temporal part chases to be represented '*as-present*', then its actual duration comes to be manifest to the perceiver. The *ballooning problem* is equally dismissed by this tense organisation: over an interval of time *dt*, the shared content between two windows separated by dt comes to be only the content in the *past and in the far past*. Thus, this shrinking of the portion of the perceived t-event over an interval corresponds, rightly, to the idea that the more time elapses the less we get in contact with past parts of the t-events. Viceversa, the ballooning of a content in adjacent window comes to be dismissed by the different tenses associated to that content: it comes to be clear to the perceiver which t-event phase is present, and which is its *past coda*. Thus, the dilatation in duration is prevented. Finally, as far as the *Stuttering Problem* is concerned, Tense Retentionalism can admit that contents are actually repeated and even that there are no *phenomenal connections* between adjacent phases. Again, the tense organisation of the content makes it no problematic for the perceiver, which perceives the same contents as occupying different temporal locations in different windows. The phenomenological declination of this is that, on the one hand,

the phenomenal connection between adjacent specious presents is guaranteed by having the same content in different windows, on the other hand the temporal organisation avoids that those contents come to be perceived as equally present all the time. This makes the subject avoid perceiving the multiplicity of contents as if the retentional stream suffered for the stutter.

Taking stock: it seems that the choice within the specious present camp is between a Tenseless Extensionalism and a Tense Retentionalism. All the problems affecting Retentionalism seem to affect just the Tenseless form. This because the temporal organisation of Tense Retentionalism provides answers to many of these. However, I will show, this is a false dichotomy: but it is the dichotomy all the arguments favouring Extensionalism we are about to assess.

4.3 The Transparency Argument

The Transparency Argument has been developed explicitly by Phillips (2010) and some tracks of it can be also found in some quotes by Soteriou (2013). The idea is to prove either PPC or *inheritance,* which implies PPC in turn (section 1.7.3) true from introspection, *i.e.* from phenomenological negative temporal transparency. As we know PPC is incompatible with PSA, thus Retentionalism would be proven false *ipso facto.* Let us asses it in turn.

4.3.1 Phillips on Transparency

Phillips (2010) Transparency Arguments attacks Retentionalism directly. Here is Phillips:

> "**Transparency.** Experience has its own temporal structure. However, when one attends to that structure (that is: reflects upon its nature) it is rational to judge that one's experience is temporally determined in some way (restricting one's reflection to that experience alone) only by taking its temporal structure to mirror the apparent temporal structure of the world experienced, i.e. by making a judgment concerning (and typically perceptually attending to) the apparent temporal structure of the world experience, and the taking the experience to have that same temporal structure.
>
> (2) Thus, we will always rationally judge an experience of succession to be itself successive in temporal structure as opposed to instantaneous.

(3) **Seems-> Is**. Experience cannot systematically seem some way to rational introspective reflection and yet be some other way. In particular, we cannot make sense of the idea that experience systematically seems to one's rational introspective reflection to possess a certain temporal ordering, when it is not in fact genuinely so ordered.

(4) Thus, contra [Retentionalism] we cannot be systematically in error when we judge our experiences of succession themselves to be successive in temporal structure as opposed to instaneous" (Phillips 2010, p-183).

Let's unpack the idea by Phillips with this example: you see my hand moving up to down. According to transparency, your introspection reveals that my hand's movement is the only thing you are attending to. However, when I ask to you: "which of your visual experiences comes first? And in which order do they appear?", you will reply that your perceptual experience of my hand being up comes first and the order of the two acts matches the order disclosed by the content. Thus, you will say that the perception of my hand being up *and then* the perception of my hand being down.

From this line of reasoning, Phillips infers that ultimately the temporal structure is sequential, as it is proved by the fact that you are able to isolate the two perceptual experiences of the two different hand's positions, and that the sequences follow the same pattern represented by the content. Thus, Phillips claims that the experiential structure *inherits* the same temporal arrangement of the content. It is the *inheritance principle* we encountered in section 1.7.3 (cf. Phillips 2010: 84). The inference from transparency to *inheritance,* is justified by Phillip's lights by the "*Seems->is*" principle, according to which we cannot be systematically wrong in our judgments about our perceptual experience. If we always judge that the order of our perceptual experiences is the same of contents', then it must be so – Phillips says.

However, as Frischhut (2014) maintains, it is here that Phillip's argument starts being unconvincing. "*Seems->Is*" gains its plausibility when it is applied to introspective judgments of the following sort: It seems plausible to say that if it appears to me that I am perceiving red (no matter of the veridicality of this perceptual experience), I am really undergoing a perception of red (and not of green). But introspective judgments of this kind are all about the content, which is indeed what is revealed by introspection.

They are not about properties of the vehicle. It is the very notion of transparency invoked by Phillips that prevents us to have access to the vehicle's extension. So, judgments of this sort do not speak against Retentionalism, since the distinguishing feature of Retentionalism in respect to Extensionalism regards the vehicle (cf. sections 3.2 and 3.3).

One may try to appeal to other kinds of judgments about our perceptual experience. But normally, they are not so bullet-proof: we have been theorising and reflecting on our perceptual experience for centuries and we have systematically believed absurd ideas, like disembodied souls. But this makes *"Seems->is"* simply false. Thus, the argument by Phillips is vitiated by a dilemma: either *"Seems->is"* is plausible, but it is useless here given that transparency prevents us to make introspection based judgments, or it is false because the history of philosophy has demonstrated that our judgments about our perceptual experience may well fail to get the things right about our metaphysics of perception.

The reply by Phillips (2010) is that temporal properties are *sui generis properties* because it is true that our sensory experience unfolds over time. That is to say, temporal properties are the only kind of properties shared by both the veihcle and the content, and this should justify "Seems->is" in turn. This reply does not hold for two reasons: given *physicalism* it is not true that temporal properties are the only kind of properties shared by perceptions and contents. Contents present us with spatial relations, and given perceptual experiences as physical, i.e. spatio-temporal entities, they enjoy spatial properties. But it is absurd to infer from this that perceptual vehicles have the same spatial structure of their contents! If the idea is to exploit the kind of properties shared by both content and vehicle, then it is difficult to understand why we should not generalise (Frischhut 2014, Lee 2014b). Secondly, unless we have not already assumed something close to inheritance (which is the consequence of the argument from transparency), we just know that both the vehicle and contents have temporal properties, we do not know if they share the same temporal properties (Lee 2014b, Frischhut 2014).

Finally, as Frischhut (2014) explains, one option on the table is to give up transparency and claim on the basis of "Seems->Is" that, after all, the temporal properties of the perceptual vehicle are revealed to me in the content. And this allows

me to judge that my perceptual vehicle is sequential, concurs with the contents and inherits its structure as the extensionalist claims. Indeed, also Phillips in his (2014a) paper seems to give himself something on these lines:

> "Experience, at least in its subjective aspect, is not coloured or shaped; it does, however *manifestly* have a temporal structure" (Phillips 2014a, p.139. my italics).

But the rejection of transparency is clearly invalidates the argument by Phillips from the very beginning.

4.3.2 Soteriou's remarks

This quote by Soteriou (2013) is worth considering:

> "There are also certain negative claims that can be made. When one introspects one's experience the temporal location of one's perceptual experience seems to one *to be transparent to the temporal location* of whatever it is that one is aware of in having that experience. Introspectively, it doesn't seem to one as though one can mark out the temporal location of one's perceptual experience as distinct from the temporal location of whatever it is that one seems to be perceptually aware of. *Furthermore, it seems to one as though the temporal location of one's experience depends on, and is determined by, the temporal location of whatever it is that one's experience is an experience of*." (Soteriou 2013: 89-90, my italics)

One interpretation seems to suggest itself. Soteriou (2013) should have an idea on the following lines: negative phenomenological transparency reveals that, contrary to Retentionalism, PPC holds. You cannot find in introspection a difference between the temporal location of the contents and the temporal properties of the vehicle of perception. This should lend support to the idea that the two, content and vehicles, are concurrent. By Soteriou's lights, this along with the assumption of transparency accepted is sufficient to undermine Retentionalism. Indeed, the latter entails that the temporal properties of the vehicle are not the same of the temporal properties of the content (cf. Soteriou 2013: 91).

Unfortunately, this interpretation of mine cannot be what Soteriou is really after. In section 1.7.3 we made a distinction between *phenomenological* and *metaphysical*

PPC. The first comes from the phenomenological observation that perceptual experience seems to be concurrent with its content. Metaphysical PPC is the idea that our vehicles really have this structure (which reflects and explain the phenomenology, Rashbrook-Cooper 2013). And it is the acceptance of *metaphysical* PPC (or, it is better to say, Metrical Mirroring) that brings about a difference between Retentionalism and Extensionalism[123]. Unfortunately, the fact that introspection does not reveal a difference between the temporal duration and location of the content and those of the vehicle, as Soteriou claims, is necessary but *not sufficient* to claim that *metaphysical* PPC holds. Introspection does not reveal that the temporal properties of the perception are divergent from those of the content, but this does not imply that they are somehow coincident as metaphysical PPC requires. In other words, if Soteriou limited himself to say that there is *no manifest* divergency between content and vehicle, then the retentionalist would agree with him. At this point of the dialectic, Retentionalism can indeed embrace transparency to hold that exactly because of diaphanousness, it is normal not to see a divergence between the temporal location and duration of the perception and those of the content.

Indeed, Soteriou seems to suggest something more, i.e. that introspection *reveals* that the temporal location of perception is *determined* (in a Phillipsian spirit) by that of the content. If this where true, it would be a strong point against Retentionalism, which would be phenomenologically inadequate. Indeed, he writes (2013: 91):

> "When one attends to what it is like to experience the perceived occurrence, and in so doing attends to the perceived occurrence itself, one does not discover any temporal part of the perceived occurrence that does not seem to be concurrent with one's awareness of it. If one holds a view according to which the indexical 'now' that is contained within the content of experience picks out an interval of time that merely includes the time at which the experience occurs, then one doesn't capture the fact that the experience *seems to have the temporal location and duration of the occurrence it represents, for one allows that the experience does not seem to one to have the duration of the occurrence it represents* (Soteriou 2013, p.91, my italics)"

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[123] Indeed, a retentionalist may even endorse an Error-Theory according to which it seems to us that perceptual experience is concurrent with the content but metaphysically speaking the act of perception is momentary.

But this is a clear violation of transparency! Our introspection tells us something explicit about how our vehicle is temporally arranged! It seems that introspection reveals the duration and the temporal location of the act of perception as being coincident with those of the content.

To recap, both Phillips and Soteriou assume temporal transparency as a guide to support PPC (or *inheritance),* in order to favour extensionalism and dismiss retentionalism. However, they seem end up contradicting themselves. Ultimately ,the best option to take home their points seems to *reject* transparency by holding that introspection reveals a mapping (as Phillips would say) of the temporal profile of the content and the temporal profile of the vehicle.

This tension between temporal transparency and the claims about the structure of the experience in Phillips and Soteriou's talks has been noticed by Hoerl (2018a), who proposes a tenseless view of perceptual content to save transparency along with the intuitions by the two extensionalists. I will explain the proposal by Hoerl in some detail in the next section.

4.4 No Temporal Viewpoint to the Rescue

As Hoerl (2018a) suggests, the air of paradox surrounding Soteriou's and Phillips's claims thins out once we take the suggestion of *tenseless contents* seriously. One apparent source of puzzlement, to which both authors are not completely immune according to Hoerl, is some residual intuition of tenses: more precisely the idea that there is an intimate connection between being *presented* to perception and being *temporally present.* A connection that should be dropped. We can understand what is going on here by picking up the common intuition that perception presents things *occupying the temporal present:* I cannot perceive Julius Caesar, I cannot perceive my little nephew. But as innocent as it may seem, this intuition still brings about transparency violation. What is present is so because, once again, it is *present relatively to my location in time*. The latter has to pop up in my introspection (violating phenomenological negative transparency in turn). Thus, if we are perceiving things *as-present*, we are still committed to the representation of *our temporal location* within

the perceptual experience, our temporal viewpoint in Hoerl's terms. Therefore, the diagnosis seems to be that Soteriou and *mutatis mutandis* Phillips have not pursued the idea of tenseless contents until the end, not having dropped the connection between "presented" to perception and "temporally present"[124].   By doing this, *i.e.* by taking tenseless contents seriously, the Extensionalist is committed to *no temporal viewpoint* (Hoerl 2018a). If Hoerl were right in his analysis about no temporal viewpoint, then there is some room to save the Transparency Argument from the self-undermining charge of *transparency violation*.

In order to understand the proposal by Hoerl (2018a), it is useful to understand it in analogy, or, better, in *dis*analogy with how spatial properties are presented to perception. Spatial properties are closely dependent upon the point of view from which they are perceived. This is intuitive: I may see the book as being *left to* the apple, but if I were on the other side, I would have seen the book as being *right to* the apple. The spatial properties are intimately dependent on the viewpoint from which they are perceived and that can be *marked out* within our perception[125]. Time is different in this respect: there is no temporal viewpoint analogous to space's in our perceptual content. Thus, there is nothing that can be marked out in the first place. Indeed, there is *nothing like the felt* temporal location of us in our perception of temporal properties, a claim which is consistent with the tenseless component of Extensionalism.

Thus, Soteriou (2013) and, *mutatis mutandis,* Phillips (2010) claim that negative phenomenological transparency reveals that it is impossible to mark out in introspection the temporal location of the content and the temporal location of the vehicle. And this is because there is no represented temporal location or duration of the vehicles in our perceptual contents. But this seems expensive for the extensionalists: If the duration of the vehicle is not within the perceptive content, we are dropping *phenomenological* PPC, one of the main motivations of Extensionalism. The upshot can be a drawback for

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[124] I wonder whether this line of reasoning hides some representationalist assumptions analogue to those I spelled out in section 3.3.3. This because the felt temporal viewpoint is brought about by representationalist considerations taking into account the fact that it is part of the truth conditions. A Naïve Realist may simply deny that there is a necessary connection between "present to perception" and being "temporally present", since there are no indexicals/tenses involved in its contents. This is interesting since both Hoerl (2013, 2017) and Soteriou (2013) are against representationalism.

[125] I remain neutral on whether this understanding of spatial property violates transparency for spatial properties (cf. Campbell 1994 for opposing remarks). Compare this with Richardson's (2014) structural properties.

those theorists, like Rashbrook-Cooper (2013), assuming metaphysical PPC as the *best explanation* of phenomenological PPC. With no *explanandum*, such an argument is not viable anymore. Secondly: the lack of viewpoint does not secure metaphysical PPC (it is not sufficient for it). Further reasons must be provided to secure it (and, as we will see, the Tense Argument is one of these). From the fact that we cannot mark out the temporal presence of the vehicle from the one of the content it does not follow that the two are actually coincident or intimately related, as metaphysical PPC claims. Finally, and foremostly, the weakness of this conclusion should be clear: the same remarks Frischhut (2014) gave to Phillips are still in play (section 4.4.1). Indeed, given transparency, a retentionalist could make the same move than the extensionalist. She can still insist that *it is plausible that* the temporal structure of the vehicle does not match that of the content, *exactly because* introspection does not reveal the opposite. This is *a fortiori true* given the "no point of view" interpretation of transparency.

As Hoerl himself suggests in a reply to Louise Richardson (see Aaron 2018), it seems that the core of the extensionalist idea is that Extensionalism is true by introspection. However, holding a no-view point transparency prevents us to make claims about the vehicle of perception. This is should not come as a surprise after all: transparency makes introspection silent on the temporal structure of the vehicle, which may be both extensional or retentional. I believe that, regardless of which specious present theory one supports, it is question-begging to appeal to transparency to infer the temporal structure of the vehicle from the temporal structure of the content. This because both Extensionalism and Retentionalism are equally plausible, given the lack of mismatch between the temporal location of the vehicle and the temporal location of the content.

To sum up, it seems that transparency brought about some drawbacks to Extensionalists aiming to prove their theory true from introspection: the idea of no temporal location to mark out within perception is incompatible with *phenomenological PPC* and it seems to make Retentionalism on a par with Extensionalism in accommodating negative phenomenological transparency.

However, there is an obvious move that the extensionalist can make, and it is to say that only Tense Retentionalism is viable, given the problems assessed in section

3.3.1 and 3.3.2. Tense Retentionalism cannot accommodate negative phenomenological transparency either, since it is committed to the representation of the temporal locations and the vehicles and this is false given the no temporal viewpoint understanding of negative phenomenological temporal transparency. This is the heart of the *Tense Argument* that can be reconstructed following Soteriou (2013). I will deal with it in the next section. However, I will conclude that the extensionalist is wrong in this move: *the lack of temporal viewpoint can*, perhaps surprisingly, *be exploited by the retentionalist to build up a version of her theory which is transparency-friendly*.

4.5 Soteriou and the Tense Argument

Matthew Soteriou's (2010, 2013) main target is Representationalism, which is traditionally the view of general perception accompanying Retentionalism (even though I am not in agreement with the received view). In particular, he rises against the idea that introspection reveals nothing about the representational properties of the perceptual experience. The *Tense Argument* plays on the traditional divide between *Tenseless Extensionalism* and *Tense Retentionalism* by showing how indexes bring about a violation of temporal transparency. Let us see its development.

Something similar to the problem of the chord (section 3.3.2) can be considered the starting point of Soteriou's remarks on transparency. Indeed, he begins with the question of how different temporal parts of a t-event (for example the different tones of our melody) can be heard as occurring at different times within the same specious present (Soteriou 2013: 91). The first option he considers is the idea of an indexical "now" whose reference is not limited to a simple instant, but it refers to an interval that *includes* the moment in which the perceptual experience is realised. Thus, it is analogous to "today", which refers to an interval encompassing the moment of its utterance. The proposal he mentioned is important for two reasons: firstly, the very presence of the indexical "now" commits the view under scrutiny to Representationalism, since it requires accuracy conditions. Secondly, the proposal Soteriou gives to his enemy is exactly the manipulation of accuracy conditions, namely the formulation of a different

semantics for perceptual contents in order to capture the phenomenology. So, once again the link between tenses or indexicals and Representationalism is very strong.

But this introduction of the indexical's semantics in the perceptive contents brings about some drawbacks from the phenomenological point of view. Let us consider again the last Soteriou's (2013) quote we mentioned:

> "So, it seems to one as thought *the temporal location and duration of each temporal part of one's experience is transparent to the temporal location and duration of each temporal part of the unfolding occurrence one seems to perceive*. When one attends to what it is like to experience the perceived occurrence, and in so doing attends to the perceived occurrence itself, one does not discover any temporal part of the perceived occurrence that does not seem to be concurrent with one's awareness of it. If one holds a view according to which the indexical 'now' that is contained within the content of experience picks out an interval of time that merely includes the time at which the experience occurs, then one doesn't capture the fact that the experience seems to have the temporal location and duration of the occurrence it represents, for one allows that the experience does not seem to one to have the duration of the occurrence it represents (Soteriou 2013, p.91, *my italics)"*

One possible reading of this quote is the idea that appealing to the indexical "now" would bring about a *felt mismatch* between the temporal location and duration of the vehicle and those of the content. The presence of the index would render the temporal location of the vehicle manifest, and this would disclose its duration as a consequence. This would be transparency-violating: temporal properties of the vehicle such as location and duration are introspectively available *within* the content[126].

This felt mismatch should be the result of the employment of the indexical "now", along with the doctrine of *Representationalism,* to which Tense Retentionalism is necessarily committed for the two reasons we mentioned above. Since, the truth/accuracy conditions of "now" are generally understood as *token-reflexive,* i.*e.* the vehicle itself occurs within such conditions, the standard Representationalist approach

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[126] Please notice that if there were metaphysically speaking a mismatch between the time of the vehicle and the temporal location of the content, this cannot be transparency violating per *se*. The violation of negative phenomenological transparency requires that some properties of the vehicle are not attributed to the environment, i.e. they must be felt as belonging to the vehicle itself.

would predict that, from a phenomenological point of view, temporal location and duration of the act of perception *are felt* within the content[127]. Therefore, we should perceive that there is a difference between the temporal duration of the perceptual structure and those of the content.

This would be even clearer if the retentionalist opted for a full-blown tensed view *a là* Almäng (2014), instead of the "now"-Retentionalism. In the full-blown tensed view, the retentional specious present includes contents as happening at different times. As we said in section 3.3.2, the retentional specious present presenting us with a melody A-C-E would have the form of "*A as past, C as present, E as futur*e", where "past", "present" and "future" refers ultimately to the time in which the momentary act occurs. All these tenses require to be referred to my temporal location, which is now felt as being different to those of past and future contents. That is to say that the same phenomenal concerns return.

Let us compare this point with a suggestion by Richardson (2014), according to which there may be some of what she calls *structural properties* revealed in perceptual experience (for us they are properties of the vehicle that are still manifest to introspection). She makes the case of the boundaries of the visual field: these are disclosed in the way in which we perceive objects, but they are not sensed as being objects or properties other than the ordinary objects or properties of our perception. Since they pertain our visual perception, the visual boundaries are considered to be part of the structure of the perception, which is nevertheless revealed in introspection. Tenses and temporal indexicals can be considered in the same manner: they are not perceived as being extra properties of objects other than those entering into the specious present[128]. It is trivial to say that, *pace* Almäng (2014), transparency cannot tolerate that properties of the *vehicle* get into the introspected content.

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[127] This way of putting things is to avoid possible remarks about unarticulated constituents (Prosser 2016 from Perry 2013), according to which the temporal location of an act is not represented in the act, since it is redundant. I think there is a misconception here. The unarticulated constituent is a feature of the superficial syntax: i.*e* "it is raining", the location of the utterance is not articulated in the vehicle, but the truth-conditions involve the place in which the utterance occurs. Since the location is part of the content, it can be part of the phenomenology regardless of whether a dedicated syntactic vehicle occurs. I will rise a similar to point against Hoerl (2017a) in the APPENDIX4.

[128] This assuming a tenseless view of reality. More on this assumption in chapter 5.

Finally, if Hoerl is right about our introspective data, namely that our perception of t-events has no temporal viewpoint, the tense argument is just one step further. The idea is that if there were tenses and indexicals, then the temporal location and duration of the vehicle would be part of the content and, given Representationalism (which is necessary for tenses and indexicals), these properties of the vehicle should be felt in our phenomenology of t-events. Since negative phenomenological transparency reveals that there is no temporal point of view, i.e. that these temporal properties of the vehicle are not reflected in our phenomenology, then, by *modus tollens,* there cannot be tenses in our perceptual contents. Since tenses are necessary for Retentionalism, given the problem of the chord, then Retentionalism is false. The corollary is of course that transparency does favour Extensionalism over Retentionalism.

At this point we may elaborate "*The Tense Argument*", according to which transparency not only favours Extensionalism, but also contradicts the predictions by Retentionalism:

THE TENSE ARGUMENT

1) Retentionalism has to face the problem of the chord
2) In order to solve the problem of the chord, Retentionalism is committed to tenses/indexicals
3) If tenses/indexical were in place, we would feel our temporal location [because of token-reflexivity and representationalism necessary to tenses and indexicals]
4) Therefore, if Retentionalism were true, we would feel our temporal location [because of 2 and 3]
5) Phenomenological Data show that there is no felt temporal viewpoint: neither temporal location nor temporal duration of the vehicle [because of negative phenomenological transparency]
6) Therefore, there cannot be tenses or indexicals in our perceptual contents (by *Modus Tollens* + Representationalist considerations)
7) Conclusion: Retentionalism is false (because of 1 and 6)
8) Corollary: transparency favours Extensionalism

This argument is valid. As a retentionalist fond of transparency, my strategy would be to give two remarks on premise 3 and challenge premise 2. Thus, I will come up with a form of tenseless Retentionalism. But before going on, some clarifications

have to be put forward in respect to the metaphysics underlying this argument. As we will see, it is not neutral.

The two remarks on premise 3 are the following. *Firstly*, it is the purported representation of the temporal location and duration of the vehicle to be a violator of the negative phenomenological transparency. This because the temporal connotation brought about by tenses can be easily attributed to the t-event outside, even if it is internally realised as a part of the vehicle. To understand this, it is easy to make a comparison with some "tense metaphysics of time", like the Growing Block and the Moving Spotlight Theory (See chapter 5). These metaphysical theories postulate that tense properties like "*being present*" are enjoyed by t-events in reality with no reference to the temporal location of the perceptual vehicle. If these theories were true, we would perceive t-events phases as temporally connoted, and we would attribute the connotation to the reality outside, according to negative phenomenological transparency.

Secondly, it is worth to point out that, among the various A-theories, there is one which, strictly speaking does not implies A-properties. It is Presentism, namely the idea that there is a coincidence between everything existing and everything present. That is to say, the whole reality is instantaneous, since it coincides with the present moment in time. An important remark has to be made in respect to Presentism: if it were true, Extensionalism would be necessarily false (Dainton 2018)[129]. This because of the obvious reason that an act of perception cannot be extended in time[130]. So, the tense argument hides an implicit anti-presentist commitment, which I accept.

4.6 Tenseless Retentionalism

4.6.1 Trace Integration Argument and the A Priori Argument by Mellor

According to Viera (2019), Retentionalism is endorsed on the basis of two orders of considerations: it best fits what we know from empirical science than Extensionalism

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[129] At least in the standard version. Altough see Brogaard (2000) for a presentist-friendly form of four-dimensionalism. And Heller (1992) and Benovsky (2009) for criticism to Brogaard's view.
[130] If Presentism were true, the forced choice would be between Tense Retentionalism and a form of Deflationist Model (see section 5.4.1).

(see section 3.3.4 for discussion on Extensionalism and empirical data) and it follows from the *trace integration argument* (Lee 2014a)*.*

The barebone of the *trace integration argument* will help to shed some lights on the view that I am pointing at. According to Lee (2014a), in a perception of *"A before B"*, it must be the case that this temporal information comes to be transduced into a spatial code, i.e. contents A and B are realised simultaneously in different brain areas. The simultaneous *realisation* of these two *relata* makes them both available to the downstream system in order to enable actions, judgments, beliefs etc... Thus, the necessity of a momentary realisation of both contents comes to be a consequence of the simultaneous *neural implementation* of those. I find this argument extremely convincing. At this point *either* the *temporal correlational principle* or the *temporal identity* principle is in place. A neat view can be to assume the realiser of the perceptual experience to be composed by both the subpersonal pre-experiential elaboration and the final resulting brain state. The time of the overall perceptual experience may be *identical* to the time occupied by the final brain state, which is in a sense momentary[131]. Otherwise, it comes to be also true that the time of the structure systematically *correlates* with those of the realising process: it systematically happens at the end of the subpersonal elaboration (cf. Grush 2005a, 2005b, 2007).

The appealing force of the trace integration argument is given by the observation that the content "A before B" has to be given all together in order to be accessible to the other processes, for example judgments, consuming it. That is why it is focused on the neural realisation of the two bits A and B, which should be simultaneously given to the downstream elaboration. The point by Lee is much more focused on the constraints to make "A before B" empirically possible, rather than a purely *a priori* reflection on perception. This latter is indeed the case of Mellor (1998: 115):

> *[C]learly I cannot see e precede f until I see f, and can only do so then*
> *if my seeing e has left some trace in me. In other words, for me to see*
> *e precede f just by seeing e and f, pe must affect pf in some way such*

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[131] Of course, it must persist for some time: also snapshot-like photograms at cinema persist on the screen for a while. This is accepted by all theories, Retentionalism and deflationist models, pointing to a momentary act of perception.

that, had pf affected pe in that way, I would have seen f precede e.
(Mellor, 1998, p. 115)

To put it crudely, this argument by Mellor does not work exactly because it focuses only on contents and not on vehicles. Every extensionalists is prone to concede that "A before B" is perceived only after B has occurred, and that content A affects somehow content B. After all, by the lights of Extensionalism, "A before B" and "A' before B" are two very different specious presents (Cf. Hoerl 2009).

4.6.2 Externalist Tenseless Retentionalism and Perception

Just to be clear, Tenseless Retentionalism is necessary not committed to temporal indexicals or tenses. Thus, it is not immediately committed to Representationalism in general perception, as its tense counterpart is. However, the received view is that a retentional account of perceptual experience should be motivated by, and it is only compatible with, a representationalist account of sensory experience. This is the view held by Christoph Hoerl (2009, 2013, 2017a). Here are the explicit motivations of his thought:

> "There is an intuitive sense in which past events are simply no longer around to figure as constituents of our experience in the way envisaged by the relational view. For us to continue to experience events after they have ceased to impinge on our sense, and to experience them as something other than present, our perceptual system itself would have to modify the way in which they are experienced from how they were experienced when we first encountered them in experience, which is at odds with the idea that its sole role is to put us in a relation of acquaintance with objects of experience, and that is these objects that account for the specific nature of individual experiences. [...]
>
> For the same reason, I believe, a retentionalist account of temporal experience has to involve an approach to the nature of perceptual experience that differs from the relational or object view." (Hoerl 2017a: 177-8).

The different view Hoerl (2017a) is pointing to is the Representational View of perceptual experience, according to which the subject enters into a representational state endowed with contents as accuracy conditions, as opposed to contents as objects in the case of the Naïve Realist view. Here two points are highlighted: 1) there is an *intuitive sense* in which objects or t-events phases in the past are no longer around to be perceived 2) it is necessary to perceive them in a different way from the present, otherwise we would encounter them in the same *way* in which we have encountered them before, *i.e.* there would be no significant differences between the way in which an object is presented in the previous and in the following windows. Hoerl is certainly right at claiming that, if accepted, these two points urge both for a mechanism able to make available an object which is no longer there, and a structure for the content. As we know, these two needs push retentionalist toward the tense version, which seems to me what Hoerl has in mind when he presses the need for a certain object to be represented in different *ways, i.e.* temporal modes of presentation in different windows. The point seems that, once again, Tenseless Retentionalism faces difficulties that only the tense, representational, version of Retentionalism seems *prima facie* able to meet.

However, there is a point in Hoerl's analysis that I reject, following our discussion about the specious present in section 3.1 and the remarks in section 4.5. To recap the discussion: In 3.1 we analysed how different metaphysics of time have an impact on our understanding of the specious present, regardless of whether it is considered retentionally or extensionally. Thus, we pointed out, along with Power (2012), that it is only by assuming *Presentism* that there is an intuitive sense in which objects in the past moments are no longer there to impinge our senses. And we pointed out in 4.5, being incompatible with Presentism cannot count as a point against tenseless Retentionalism no more than to Extensionalism. Temporally extended vehicles cannot allow presentism to be true (Dainton 2017). However, Naïve Realism, which is usually accompanied with Extensionalism, makes things even worse: without objects in the immediate past there is nothing one can be in an awareness relation to. This problem is inherited by Tenseless Retentionalism, if, *contra* Hoerl, it is coupled with Naïve Realism. Moreover, the same problem arises for those theories, like Externalist Representationalism, assuming the phenomenal character of sensory experience be constituted by elements of the environment.

Setting Presentism aside, all the other theories (Growing Block, Moving Spotlight, B-Theoretical Block) admit that objects occupying different locations in time still exists in the same way as things at the present moment (although they may not enjoy the property of presentness). Thus, I think that in avoiding *Presentism,* it comes to be open to the retentionalist to include chunks of reality as constituents of the t-events phenomenology. There is nothing incoherent for a subject to have a certain brain configuration at *t* (serving as the vehicle of perceptual experience), which makes her in an awareness relation with an interval *dt* including *t* itself. On the contrary, once we have taken stance for Retentionalism, a mapping from the time of occurrence of the vehicle and the interval present to the subject seems always conceivable[132]. Then it is up to the retentionalist to interpret this structure as involving or not accuracy conditions as the externalist representationalists do[133]. Otherwise, one may assume that this phenomenology does not involve any accuracy condition and go for a full-blown naïve realist conception of perceptual experience. It is worth to point out that even Soteriou (2013) may be interpreted to be after an idea of this kind, when he proposes on the behalf of representationalist to think about an indexical "now" spanning over an interval rather than an instant.

Thus, if what I said in the previous section is correct, a way to interpret Tenseless Retentionalism is to assume a broadly externalist stance over phenomenology, either by admitting Externalist Representationalism or by accepting Naïve Realism. This means essentially to endorse the Martin-style (2002), *negative metaphysical transparency,* which implies negative phenomenological transparency in turn (cf. Gow 2016) (section 4.1). This should not be particularly costly in respect to my opponents: the majority of them (*i.e.* Hoerl 2013, Rashbrook-Cooper 2013, Soteriou 2013 and, in a more cautious way, Phillips 2010) went for Extensionalism because they are convinced that it is the best way to make sense of Naïve Realism, which implies negative metaphysical transparency in turn (I postpone the considerations about Dainton's view to 4.6.3).

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[132] Moreover, under a B-theoretic Eternalist Block *t* is present because you are in relation to it rather than *viceversa* (Power 2012).

[133] The easiest way to have externalist truth-conditions in order to is to interpret contents in a Russellian way, by assuming that perception involves grasping truth-valuable propositions, which are constituted by real objects in the environment.

We are now in position to reply to the Tense Argument by Soteriou (2013), with negative metaphysical transparency in play, we can accommodate the idea that our introspective data reveals nothing about the temporal location and duration of our vehicle of perception. In particular introspection reveals nothing about the particular temporal location and duration of the vehicle, *in accordance to the No Temporal Viewpoint doctrine*. Part of the tense argument is the idea that Retentionalists needs tenses to solve the problem of the chord. The appeal to negative metaphysical transparency both helps with the introspective data about a lack of temporal location of the vehicle available to introspection and gives a solution to the problem of the chord. Let see how.

To put it briefly, real change, motion and rest in the environment constitutes our phenomenology of these events. The problem of the chords pushes us to understand why it comes not to be the case that, for example, motion is always delivered as a blur: motion requires temporally ordered phases to unfold. If all were presented *as present* in the specious present, all the phases would be perceived as simultaneous, and thus our perceptual experience would collapse in the experience of blur. As we said, naïve realism avoids that tenses deliver this result. However, we need a way to structure the specious present, such that the subject has it clear that the phases are temporally ordered. This would solve the problem of the chord.

Let us start with the assumption that, contrary to space, time has just one direction. In other words, time is *ordered* and *asymmetric*[134]. Take this case: a pen falls from my hand and hits the ground. The falling of the pen is *absolutely before* its hitting the ground. By that I mean that in reality the temporal order of the events, *i.e.* the set of the cross-temporal relations among them, is not dependent on the temporal location of anyone. Whatever it is the point in time from which you are perceiving reality, it cannot *ever* be the case that the hitting the ground precedes the falling of the pen. This is obviously different from the case of space: the book's *being left* to the apple is dependent from my spatial perspective, as we pointed out above. Spatial location and many spatial relations are dependent on a third point (the point of orientation) to be

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[134] Or it is approximately so in the small portion of the universe in which our perceptual abilities evolved.

given in perception. This is not by chance: space is multidimensional. Within the 3 dimensions objects may be located and move along infinite axes of direction, that is we always need a point of orientation[135] to map the space. I let to metaphysicians of physics the burden to assess whether it is possible to locate things in an "absolute" space, not dependent from any fixed point of reference. My point is simply that the same problem does not arise for time, since there is just one sense in which temporal events are arranged (time asymmetry)[136]. If this is on the right tracks, then it seems that temporal relations like "*before that*" are instantiated by events in reality and there is no need to fix temporal coordinates to orient our temporal field. It is already oriented because it is simply about these events in reality as the relations which are *already out there*. These relations are already sufficient to make a retentional specious present structured in the way required to solve the "problem of the chord". Indeed, I hear *a tone before the second tone, before the third tone*. Given negative metaphysical transparency, there is nothing in this content that commits me to the idea that the retentional structure of the perceptual experience is ruled out from the board. This retentional specious present fully mirrors what is out there in reality[137].

The peculiarity of time in this respect is that *genuine relations* among events are perceived among with events themselves. So, in my view, the notion of metaphysical temporal transparency at issue makes it the case that the structure of the phenomenology/appearance of change is ordered because events themselves in reality to which we are related to are ordered via "*before of*" relations. These are indeed constituents of our phenomenology. This is in line with the broad externalist conception brought about by the notion of metaphysical transparency itself, which I endorse in my account and whose neural implementation I will explain in section 4.7.

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[135] Not necessarily the first-person perspective, but a fixed point is always required for every spatial representation.

[136] As brought to my attention by David Papineau [personal communication], it is no longer possible to explain the asymmetry of time in virtue of our structural properties of vehicles, since the order of explanations are reversed. However, I believe we can still appeal to the asymmetry of causation in order to explain that.

[137] It is clear that I take the relevant temporal relations to be non-neutral (positional) in the sense of Kit Fine (2000).

Thus, perceiving relations is common in perception, spatial relations are a clear example, but we have seen how this is related to a kind of orientation which is absent in time. This allows to resist the Tense Argument by challenging the assumption that Retentionalism is committed to Tenses in order to solve the problem of the chord. However, it may be the case that the problem of the chord is in place for Retentionalism combined to other theories, for example internalist representationalism. I do not think so, and I am about to argue for the opposite in the next section.

4.6.3 Internalist Tenseless Retentionalism: dismantling the Problem of the Chord.

So far, so good. But It would be a weakness of my theory if it would not be able to accommodate also *internalist representationalism*, namely the idea that our phenomenology is a representation internally realised. So, my theory would be better if it turned out to be compatible also with the mainstream view according to which only phenomenological negative transparency is true.

However, the accommodation of internalist representationalism within the framework of tenseless retentionalism may be puzzling. In a broadly externalist phenomenology, we may simply assume that A appears before B because the event "A before B" is itself a constituent of the phenomenology. Therefore, the specious present, in a sense, structures itself along with the perceived t-event. But this is not available to internalist representationalism. So, one may still fail to see how contents realised in the same moment does not bring about contents perceived as simultaneous (which is once again the request to solve the problem of the chord).

I do not think that the internalist representationalist has to worry too much. On the one hand, I still think that a *time marker view* may be of some help to make the subject represent an ordered relation "A before B", without relying on externalist phenomenology. According to a *time marker view* simultaneous neural realisers are "marked" in such a way that the realised contents are given a temporal location accordingly. Such an internalist representation (accommodating phenomenological transparency only) is not committed to tenses. The subject is aware of the order of the *relata* because their realisers are marked subpersonally and this is sufficient to generate

the structure of the contents ordered tenselessly[138] (I still remand to 4.7 for further details on how this may work).

On the other hand, there are flaws in the formulation of the problem of the chords that are now to be assessed. The option by Hoerl (2018) to decouple the notion of "temporally present" from the notion of "present to experience", i.e. the heart of the No Temporal Point of View interpretation of transparency (section 4.4), can be applied also to phenomenological transparency. Without (misapplied) tenses, namely without the idea that there is a tense like "*being present*" ranging all over the content, the problem of the chord simply does not arise. Let us see this more closely.

The problem of the chord is generated by the idea that contents within the same windows are presented as simultaneous. But in order to reach this conclusion, at least one of the following hidden assumptions is necessary. HIDDEN ASSUMPTION1: all perceptual contents must be presented as "*temporally present*". In other words, the assumption that "if A and B are realised simultaneously, they are perceived as simultaneous" is driven by the idea that A is perceived *as present*, B is perceived *as present.* Thus, both A and B are perceived *as present,* therefore they are perceived occupying the same temporal location. But this exactly what we are dropping going along with Hoerl (2018) and decoupling the notion of being temporally present and being presented to perception (section 4.4). HIDDEN ASSUMPTION 2: Contents realised at the same temporal location should be felt as occupying the same temporal location. But this is Metaphysical PPC, since it assumes that the temporal location of the contents matches that of the experience (section 1.6). And Retentionalists rejects any Metrical Constraint. HIDDEN ASSUMPTION 2 is question-bagging against Retentionlism (cf Lee 2014b). Hence, also internalist representationalism may allow the representation of "A before B" within an instanaus act, and [A before B] does not require tenses.

There are is another way to see this issue. An internalist representationalist, which is fond of analogies with languages, can make the case of a sentence written on a blackboard. For example: "Caesar wrote the *De Bello Gallico* before passing the Rubicon". Both the constituents "Caesar wrote the *De Bello Gallico*" and "passing the Rubicon" occupy the same temporal location (the sentence may appear and be deleted

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[138] I think that this is more or less what Geoffrey Lee (2014a, 2015) has in mind with his discussion about experiential parts/realisers.

all together, let us suppose), but the overal content is clearly temporally ordered. Hence, the internalist representationalist accepting only negative phenomenological transparency, along with the other externalist theorists, has not to be impressed by the problem of the chord. Further information of how from synchronous neural realisers we may generate non-simultaneous contents will be given in section 4.7.

Thus, whilst I am inclined toward an externalist view, which is more challenging to explain, I take to be a point of merit of my theory the ability to accommodate a great amount of theories of general perception (the most popular ones indeed), namely representationalism (in both an externalistic and internalistic fashion) and naïve realism. This is in line with my initial *tenet* of a physicalistic conception of the mind since sense-data and indelism are at odds with that.

The game is not over of course: several other problems have been rised to retentionalism and they can hit one or the other of the versions of my tenseless theory. I will dismantle them in the next section and I will conclude by providing some remarks on how retentionalism may be implemented in 4.7.

4.6.4 PSA, the retentional stream and their solutions

As far as the streamal problems are concerned, let us start with the *Ballooning Problem.* Independently on the notion of transparency one is meant to take, the problem itself arises from a misconception. Indeed, the heart of it is in the idea that the closer in time the widows are, the more content they share. The more far the windows are, the less content they share. This is simply obvious, and it cannot count against any particular form of Retentionalism, since it is common to every theory allowing for overlapping contents among adjacent specious presents. Think of it in analogy with space: if you are on a train in movement and you look outside, your visual field presents a portion of the landscape to you. The more the train goes, the more the visual field presents you with new things and others get out. It is obvious that in two close positions there is more to share that in two distant positions. The Ballooning Problem would be a

problem if the more time passed, the shorter the specious present became: in that case you would be really be aware of a smaller portion of a t-event, the more time elapses. But this is not the case: the windows' span remains more or less constant at each instant. So, you are always aware of roughly the same amount of temporal information. The other mistake behind the Balloning problem is the assumption that over an interval we are aware of a duration equal to the shared content of the windows occurring at that interval. But this is not true: the total perceived duration takes into account also the non-shared contents. And the farer we go in time the less shared contents there are, and the longer the perceived duration seems to us.

In the *Surplus Content Problem*, an instantaneous flash comes to enter in more than one specious present, and thus it comes to be the case that it is perceived for a significantly longer duration that its actual one. It is clear that this problem arises from the discrepancy between the actual temporal location of the instantaneous flash and the interval occupied by the sequence of acts presenting that flash. The assumption is that what is presented to perception is felt as *temporally present.* So, it seems that the temporal location of the act is revealed in each content along with the flash (cf. Rashbrook-Cooper 2017). It is the same remark at the base of the Tense Argument. The result is that the flash is interpreted as lasting as the temporal location occupied by the sum of the acts in which it is presented. However, dropping tenses means dropping the that idea that we feel the flash as temporally coincident with the act. Thus, it cannot *a fortiori* be the case that a certain content is felt to be present for the duration of the sum of acts presenting it. Therefore, we don't perceive t-events as dilated.

As far as the *Stuttering Problem* is concerned, we should recall that it is composed by two sub-problems. The first one is about how to make sense of the phenomenal overlap between adjacent specious presents without ending into an infinite regress. The second one is the *stutter* effect occurring after the repetition of the same contents in those adjacent specious presents. This is the phenomenological implausibility of the stuttering (section 3.3.2). The answer to the first point is by Lee (2014b) who rightly points out that the "moving window" structure makes it able to perceive the continuity among contents falling into different windows: we may perceive in a window for example that A precedes B, and, in the following window, that B

precedes C. This guarantees no interruption in the continuity of the represented (section 1.5) of the process A-B-C across the various windows.

My further move is to claim that the way in which both Dainton (2014b) and Pelczar (2014) frame the rest of the problem is not only completely unjustified: it is wrong. To see why, recall that the worry by Dainton (2014b) and Pelczar (2014) is that there is no "phenomenal connection" between the two contents B in the two windows. Thus, they ask for an extra window connecting the two "Bs". But the phenomenal connection we are after is, in a charitable reading (see section 1.5), about *diachronic relations* connecting the various phases of the t-event. Claiming for a phenomenal connection between the two "Bs" means to ask for a connection between bits of content occurring at the very same instant! Thus, it is far from clear why the retentionalist should be forced to make a phenomenal connection between contents which, if not identical, are synchronically, rather than diachronically related.

Let us better explain this last point with an example: we can assume a soloist playing E – G – A - B – D – E. What one perceives in Dainton and Pelczar's reconstruction is something like "E–G-G-G-G–A-A-A-A–B-B-B-B–D-D-D-D–E". This because the windows are so arranged: [E,G], [G,G], [G,A], and so on and so forth… (Section 3.3.2). Now, let us consider the first part of the perceived sequence "E-G-G-G-G-A". If that is what the subject perceives, it seems fair to describe the subject overall experience in the following way "E before G, G before G, G before A". This means that, according to Dainton and Pelczar, after perceiving "E before G", a subject perceives "G before itself"![139] Indeed according to them a window [G,G] has to be postulated in order to guarantee the continuity of the represented. But this is a false problem: the continuity of the represented is a matter of contents diachronically arranged. There is no need at all to bother with contents happening at the same time. To put it simply: it is not a prediction of the Retentional Theory to postulate a window, *within which* synchronous, if not even identical, contents are perceived as diachronically decoupled. I believe that these considerations are sufficient to block the *infinite regress* part of the *Stuttering*

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[139] One may wonder whether the situation cannot be interpreted as having two different contents of the same type (i.e G-percept), which we interpret as being associated with two different token G in the environment. But this is just to rephrase the problem as addressed by Dainton and Pelczar. As it will be clear in a while, it is up to them to provide reasons to interpret things in this way. Indeed, if I perceive twice the same door, I have two perceptions of the same kind, but I do not think there are two doors.

Problem. We should stop positing windows when the decoupling of synchronous contents starts, i.*e.* when contents are decoupled within the same window.

The second part of the stuttering problem is about the challenge of phenomenological implausibility of having repeated contents in adjacent windows. Thus even if the infinite regress is blocked, the sequence perceived by the subject is still something like "E-G-G-A-A-B-B-D-D-E", this is motivated by the idea that the overlapping windows are the following: [E,G], [G,A], [A,B], [B,D], [D,E]. We should then ask what exactly the role of the windows is at generating the distorted sequence. Why does not a so-arranged stream enable the perceiver to listen to the real one, namely E-G-A-B-D-E? There are two points in here: firstly, we should understand why detractors of Retentionalism are led to assume that it is *unavoidable* for the retentionalist stream to generate the distorted sequence. Secondly, assess whether it is really an essential feature of the theory that generates it.

It is clear that detractors of Retentionalism are committed to the idea that a certain tone is perceived as many times as it enters into a perceptual act. Thus, if content G falls within two windows, it is perceived *twice*. Probably this is correct, but this does not mean that it is perceived *doubly, i.e.* as if there were two Gs. And the problematic aspect of the stuttering objection resides in the fact that the same content is *perceived doubly*, *i.e.* as if they were two, and not in the fact that it is *perceived twice over*, *i.e.* presented in two windows. Only by accepting this assumption, detractors of Retentionalism may claim that the moving window model brings about the perception of the *distorted sequence* rather than the perception of the real one. The passage from being perceived twice to being perceived as two is exactly the assumption by Dainton and Pelczar that we should drop. In order to counter the stuttering problem, it is useful to provide reasons on why this principle does not generally hold. This would make it illegitimate to apply it to the moving window model without independent reasons. Then we should understand whether there are these independent reasons and understand in what extent they are related to the moving window conception of the stream.

To put it simply, the assumption that "perceiving twice is perceiving two" is completely ungrounded. This for a plenty of reasons. Firstly, remember the distinction between perception *strictu sensu* and experience *latu sensu* we made in chapter 2 in

our introduction of the deflationist models. We said that Pheno-Temporal Realism in that context is reached by speaking about phenomenology *latu sensu*, since strictly speaking, deflationist perceptual acts have instantaneous contents[140]. Indeed, it makes no sense to speak about "perception" *strictu sensu* in the very first place, since as we have seen above, no window presents us with the very same content as if it were decoupled. So, it would be better to formulate the point in this way: perceiving twice (*strictu sensu*), namely as if the same content falls within to windows, is *experiencing* two (*latu sensu*). But this implies the obvious falsity according to which we should *misrecognise* (rather than *misperceive*) an object to be numerically different every time it comes to be an object of my perception.

To see what I mean, simply compare the two following cases at the synchronic level. *Case1:* I look at a door at *t1*. I close my eyes and I reopen again after a while, at *t4*. I see the door again. *Case2:* at *t5* I look at a couple of apples: they are qualitatively indistinguishable and if a friend changes their position, I am not able to recognise which apple is which. How many things are we presented with in the two cases? In *case2* we are presented with two numerically distinct objects, in *case1* with just one door. The obvious difference between the two cases is that in *case1* we, as philosophers, are considering two different acts of perception of one thing, the door. Thus, we have a perceptual act of *single* thing and another act of a *single* thing. In neither act I perceive two doors. Moreover, if in the meanwhile one substituted the door with another qualitative indistinguishable, I would never realise that the change has happened: this suggests that I *do not recognise* the fact that, in this latter scenario, the doors are actually two. So, neither in this case involving two perceptions *strictu sensu* of two doors, I would be able to experience *latu sensu* two doors. In *case2*, we, as philosophers, are considering a single act presenting *two* apples. And it is only in this case that we can truly say to have *perceptual phenomenology (strictu sensu) of two things*.

Please notice that I choose deliberately an example in *case1* in which it is clear that the acts of perception are indeed *two*. But this is an illusion generated by the toy-example I made. What occurs in the case of the door is that you know that you have a cluster of acts before closing the eye and another cluster after. You know that the time

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[140] This distinction is echoed in the Dretske's fact-based analysis of "change blindness" (Dretske 2004; 2007).

elapsed is sufficient to consider them as distinct clusters, as well. But you have no access on how many acts are there (before and after closing the eyes). This is due to the considerations by Rashbrook-Cooper (2013) (section 3.1), according to which the span of the specious present is not manifest in our perceptual experience. So, we cannot know by introspection how many windows are there.

Further support to the claim that we do not even misrecognise the same content to be two comes if we endorsed negative metaphysical transparency, according to which the phenomenal character of my overall experience (*latu sensu*) of the solo is constituted by the mind-independent tones. The phenomenal characters of the two windows are literally constituted by the same tone, and therefore it comes to be unclear why one should recognise it to be double. Remember the example of the two houses sharing the same gardens I made to explain Dainton's view (section 3.2.3): we do not neither perceive, nor recognise two gardens, even if the houses are two. The same happens here. An internalist representationalist accepting only negative phenomenological transparency, on the other hand, may even mock Dainton. As we will see in 4.7, the vehicle of the retentionalist act is a complex vehicle, made by sub-vehicles. One can exploit the idea that two adjacent acts share the numerically identical sub-vehicle, and thus the "perceptual experiential part" is the same and not repeated, in the same way in which Dainton's suggestion works.

This latter suggestion also highlights why Dainton and Pelczar are prone to accept the principle upon which the stuttering problem is built: namely that I "misperceive", or better mis*recognise*, as many contents as many acts of perception. So let us analyse the *independent reasons* that Dainton and Pelczar have to endorse it. To put it simply: they refute negative phenomenological transparency. In other words, my suspect is that they have their own conception of general perception in mind, i.e. the *Sense-Data* Theory in the case of Dainton (2000) and *idealism* in case of Pelczar (2015). In both these widely discarded theories what a subject perceives in each act is a mind dependent object. Presumably the latter is hypostatised by the act itself. Thus, in two adjacent windows [E,G], [G,A], two numerically distinct objects comes into existence: namely "E,G" and "G,A". Thus, it is no surprise that they think that the tone G is actually listened twice: both objects have a G-part, which is numerically distinct from the other in this respect (since they are both generated by different acts).

More to the point, as the discussion is section 3.2.3 should have made clear, it is not a case that Dainton set up his dialectic in defence of the Overlap Model by stressing onto the numerical identity between experiential parts in different experiential acts: he has in mind a conception of perceptual experience according to which at each act an object corresponds, and the Overlap Model is built in order to make these objects sharing parts. However, since I am working within a *physicalistic* perspective, such commitments to *sense data* or *ideal objects* are ruled out by default. For our purposes, it is up to Dainton and Pelczar to provide independent grounds for their theories of general perception, and for ruling out any interpretation of those that avoid the stuttering problem: *i.e.* that the mind-dependent objects do not share any part, nevertheless.

The final problem we are about to assess is the Law of Experience problem by Pelczar (2014). The idea is that PSA cannot allow for physicalism in a reversed world, Unworld. In this world would be delivered with a phenomenology which does not conform to the laws of physics (section 3.3.1). The way in which the physicalistic retentionalist may answer to this objection varies according to the theory of general perception she is willing to endorse. If she believes in a kind of Naïve Realism, according to which chunks of reality constitutes the phenomenal character, then the spatio-temporalised instantaneous realisers in our brain make the subject aware of the order of the events in Unworld. Thus, there is no mismatch between the phenomenology and the Unworld's events unfolding lawlikely.

The same happens in case of a form of Externalist Representationalism. In this case the "relation" between subjects and events is mediated by the interpretation of the content as having accuracy conditions. Usually the phenomenal externalist piggybacks on some naturalistic account of accuracy conditions fixation, in order to make a certain abstract "mental token", realised by certain brain states, to be about certain conditions in the environment. One popular account is *via* natural selection (Millikan 1989): contents are not fixed from the beginning, but it come to be the case that representing things in a certain way makes an advantage in terms of fitness. It is reasonable to assume that it would be more convenient in Unworld to represent how things are in Unworld instead of how things are in our world. Thus, the very same

configuration at *t* in Unworld can represent something different by *realising* the *same mental* token. Nevertheless, the mental token is *related to different conditions* in the environment from those in our world. If representationalism is internalist probably the best way to go is to downplay the import of the Law of Experience in the first place and provide examples where our perceptual experience is misleading in this respect. For example, we do not see tables as made of atoms and void.

With these remarks we have finished the discussion about my own proposal: Tenseless Retentionalism. The last section of this chapter will provide some suggestions on how to make it work by taking into account its neural implementation.

4.7 Neural Implementation

The last issue is about phenomena, like apparent motion and the Cutaneous Rabbit illusion, giving trouble to those views assuming Time as its Own Representation (*TOR*), either at the conscious level (Extensionalism) or at neural level (*Braintime View*). The starting point of my account would obviously be the implementation of the Principle of Simultaneous Awareness, namely of the idea that *successive contents* are simultaneously given to the same act of consciousness. Since the act must be momentary, some kind of synchronous realisation of these contents has to take place. This (unfortunately) speculative section tries to give some suggestions in this direction.

As it should be clear from our discussion in section 3.2.5, postdictive phenomena have been usually taken into account to cast doubts over the idea that the order of the vehicles resembles the order of the sensed contents. This has been carried on in a double fashion, either by attacking directly Extensionalism (Grush 2007), or by attacking Cartesian Materialism, the idea that there is a privileged place in the brain, the so-called *Cartesian Theatre,* where elaborated information comes to in order to become conscious and displayed in the right order (Dennett 1991, Dennett and Kinsbourne 1992). Dennett and Kinsbourne famously argue that the elaboration of information must be widespread both-spatially and temporally. They state that vehicles, intended by both Dennett and us to be neural realisers, should not share necessarily the same spatial or temporal properties of the contents. Otherwise, it is a content/vehicle confusion.

Within Tense Retentionalisms both these requirements can be easily met to avoid the Cartesian Theatre. It is the case that the simultaneous realisers related to non-simultaneous contents are spatially distributed over different parts of the brain (Lee 2014a). However, a certain temporal dimension, namely synchronicity (or a good approximation of it) matters here. At a certain instant t, one may suppose that contents A, B, and C are realised together in different areas and they give rise to the specious present [A,B,C]. Assuming a naive realist framework (but the same holds for Externalist Representationalism), we may say that the vehicle v1 enables the awareness relation with A, v2 enables the awareness relation with B, and v3 enables the awareness relation with C. Therefore, we may say that a certain realiser V={v1,v2,v3} occurs at t, and enables the awareness relation with A, B and C in the environment. Since A, B and C occupy different temporal locations, and these are internally ordered following the asymmetry and linearity of time, then V makes the subject in relation to the specious present [A,B,C]. The window "moves", when at t' v1 fades away and is replaced by v4, which represents D. Thus we have another "global vehicle" V' at t', representing [B,C,D]. Phenomenologically speaking, since we are aware of different contents occurring at different times, these contents are ordered in virtue of the cross-temporal (*before of*) relations which are fixed by the linearity and asymmetry of time. In analogy with space, I may perceive three objects in line in front of me: I do not perceive them as occupying *the same location* because I may be in relation with all three of them, and they are actually arranged in a certain way. The difference in the case of time is that, as we have seen, there is no point-of view in our perceptual experience, which is useless given the very nature of time.

From the point of view of the realisers what happens is that A causes the vehicle v1 to occur in the first window in which A is present, while some other processes maintain the vehicle occurrence in the following windows. This helps also to explain away some perplexities about naïve realist Tenseless Retentionalism: one may suspect that at t when V occurs, A is too far in time to be causally efficacious for the occurrence of V. Indeed, A was not too far in time in order to cause the occurrence of v1, and a

causal process relates v1 to V. We should not underestimate that V is a complex vehicle, which is made by sub-vehicles with each with a different causal story[141].

However, a tenseless retentionalist may be willing to go internalist and opt for a representationalist story in which subjects are presented with contents of the form *"A before B"*, so tenseless contents, but without relying on an externalist phenomenology. I still believe that the causal story I made can be of help for the internalist who can claim that the phenomenology is fully realised by these vehicles, whose markings structure the specious present, even though they are not themselves part of the specious present. In other words, I believe that the mentioned causal story is sufficient to give the internalist representationalist a syntax to express contents in the form of "A before B", without relying to constituent like tenses, whose semantics involves token-reflexive reference to the act itself. This is all about the retentionalist implementation of the tenseless specious present.

Since my favourite version of tenseless retentioanlism is still broadly externalist, I have to assess some other points on my agenda. The first one is obviously about apparent motion, the Cutaneous rabbit and the other postdictive phenomena. Usually Retentionalism is accompanied with an Orwellian-style story when postdictive phenomena are in place[142]. Indeed, a possible interpretation of what goes on in the case of apparent motion is that a veridical perception of a dot and a blank screen at *t* comes to be replaced with *a non-veridical perception* at *t'*. It can be the case that two rapid dots in different positions elicit the elaboration of motion from area *V5*, and thus the creation of the vehicle supporting the phenomenology of motion. The brain, after all, is an interpretive machine and it may be the case that at each time an enormous amount of contents is processed and just part of them comes to be conscious (Dennett 1991)[143]. I can be neutral on this point.

The second point is about the relation between this proposal and the *BrainTime view,* namely the idea that the order of the brain vehicle mirrors those of the perceived

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[141] I think this view has some similarities with Lee's (2014a, 2015).

[142] Indeed this is the standard interpretation of Grush's (2005a,b, 2006, 2007) trajectory estimation model. It is worth to point out that Mölder (2014) is not of the same advice.

[143] This way of thinking has some affinities with the Multiple Draft Model (Dennett 1991, Dennett and Kinsbourne 1992).

contents. As we have seen in section 1.2, there are three temporal dimensions we have to look after: the time at which the phases of a certain t-event take place (event-time), the time at which vehicles occur, and the time at which t-events are *felt* to occur (subjective time) (Arstila 2019; Mölder 2014). In the picture I drew, there is an obvious correlation between the time in which the perceptual experience occurs and its vehicles (temporal correlation – section 1.2). However, in the creation of a specious present, there is a breakdown between the time of the sub-vehicles and the subjective time. This is no surprise, in a retentionalist perspective contents occupying different temporal locations are simultaneously realised and presented in the same act. The externalist/naïve realist component makes my Tenseless Retentionalism an "event-time view", meaning that our brains tries to recalibrate the signals in order to make vehicles synchronous (cf. Arstila 2019). The idea is that signals carrying information from various modalities about different contents must be *synchronised* in order to generate our conscious experience (we may call this "synchronicity threshold"). This grouping of information, together with the marking of each content enables our order-judgments. However, a sort of *Brain-Time* view, i.e. the idea that the order of processing somehow matters for our perception of order follows from the implementation of the "*moving window model*". Indeed is part of my idea that when we start experiencing [B,C,D] after [A,B,C], content D comes to be part of another conscious content, also because it has not be realised *synchronously* with A. It has been realised after A indeed.

This reflects some suggestions about the temporal *asynchronies,* which are often studied in the empirical literature (Johnston and Nishida 2001; Nishida and Johnston 2002; Moutoussis 2014; Yarrow and Arnold 2016). There are two types of perceptual asynchronies. The first one is about internal asynchronies of the same stimulus in vision. Indeed, when we perceive a moving dot reversing trajectory and changing colour simultaneously, we perceive the colour change to be faster than the motion reversal. My position is compatible with Johnston and Nishida's (2001) and Nishida and Johnston's (2002) story about the fact that motion reversals require more information to compute in respect to change in colour. Thus, more time is needed to generate the relevant vehicles, which may escape the synchronicity threshold for this reason. In my perspective this means that, for example at *t1*, we have vehicles making us aware of a moving red dot, *i.e.* the vehicles about colour and motion occurs simultaneously. Then,

due to latency reasons, at *t2* there is no vehicle of colour red anymore (which has been substituted by colour green, let us say). However, the old vehicle of motion is not off the ground yet. At *t3* the new motion vehicle with a different direction is now realised contemporary to the colour vehicle. What is interesting is that this is not even, strictly speaking, an illusion. At *t2* you are still aware of something that is still real: namely the direction the dot *had*.

The other case of asynchrony is about the difference in perceptual judgments in *separated stimuli*, for example two asynchronous stimuli (two taps one at nose and the other at the foot separated by tens of milliseconds) are perceived as synchronous. The point to bear in mind is that our brain recalibrates the time of the signals in order to adapt to the t-events outside: mistakes may be again due to differences in sub-personal latencies bringing about the two vehicles within the same synchronicity threshold.

The third point I would like to make is about a sort of betrayal of the Dennettian idea according to which there is no a definite moment in time in which a certain content gets conscious. Since I am assuming that synchronicity plays a role at generating the retentionalist perception, there should be a moment in which a perceptual experience takes place, and this may seem to point to a Cartesian Theatre (cf. Dennett 1991, Dennett and Kinsbourne 1992 but see also Akins 1996). Given the physicalistic framework assumed here, we have to assume at the minimum that perceptual vehicles occur in time, since they are physically realised. Thus, there must be a moment in time when a certain brain configuration gives rise to a specious present.

As far as I can see, Dennett and Kinsbourne are concerned with what Akins calls the "*temporal binding problem*" (Akins 1996), which is, once again, the idea that temporal illusions run against the assumption that the temporal order of the vehicles matches those of the contents. The idea opposed by Dennett and Kinsbourne of a determinate moment in which a content becomes conscious seems to me to reflect the need of a temporally ordered sets of perceptual representations mirroring the perceived contents, rather than the idea that contents are not realised in time by physical vehicles. This claim of mine has some support in *Consciousness Explained* (1991: 131), where Dennett explicitly claims that "*the spatially and temporally distributed content-fixation in time are precisely locatable in both space and time*" (cf. also Akins 1996).

Related to the Cartesian Theatre there is also the idea of an *audience*. Indeed, part of the Dennett's overall strategy against the Cartesian Materialism aims to dismantle the idea of a homunculus to which images are presented in the theatre. Probably the most charitable interpretation here is that the theatre *is* the homunculus. But this does not matter. What is important is that the idea of the Cartesian Theatre naturally points to homuncularism, as many commentators of Dennett and Kinsbourne point out[144]. I will not spend more time in assessing the relation between the Cartesian Theatre and the Homuncular view (something more will be said in the APPENDIX4). Now, I dismantle the idea that my Tenseless Retentionalism is homuncular in the first place. The Naïve Realist and Externalist components of my view avoid that phenomenology is conceived as an internal projection of images. In veridical perceptions subjects are in relation with things in the environment, and there is no need to postulate a "true subject" which enjoys the show in the Cartesian Theatre. Of course, all of this relies on the assumption that there is no self over and above the bunch of vehicles in relation to the environment. Indeed, these remarks on the Cartesian Theatre are the reason why I am personally more inclied to the externalist conception of tenseless retentionalism. Externalism provide answers to the issue. A Cartesian Dualist would not like my proposal.

APPENDIX4: On Demarcation Again

We saw in section 1.3.1 how it comes to be difficult to demarcate the various theories of t-events perception. This is especially true when we are trying to make a clear distinction between some Deflationist Models and the Specious Present Models (Hoerl 2017a). However, a sort of legitimacy issue remains also within the these latter. To understand why, let us recall how we settled the task for a theory of t-event perception in chapter 1: the aim of any theory of this sort was to give an account of how the phenomenology of t-event is actually possible. The answer for both Extensionalism and Retentionalism is, as we know, to postulate a specious present. They assume that a

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[144] Dennett himself makes the homuncular metaphor in many interviews. For ex.
https://www.youtube.com/watch?v=a3a2FFoRpzQ&frags=pl%2Cwn

subject is presented with an extended content, encompassing an interval, in each act of perception. So far, so good.

Once we have settled the debate in favour of the specious present, it comes to be unclear why one should bother to defend one or the other of the specious present views. *Prima facie,* temporal properties seem like properties among the others, exactly like *red*, *bigger than*, *left of*[145]. Properties of this sort are usually taken into account by theories of *general perception* (Naïve Realism, Representationalism, Sense-data, Qualia Theory etc..)*.* These purport to explain the phenomenal character of sensory experience, *in virtue of* a certain understanding of the relation between the subject and contents with a certain nature. Thus, the question comes to be very simple: once we admitted that the content is extended, why should we bother to engage in the Retentionalism/ Extensionalist debate? After all, since "specious present" is just the name for a kind of perceptive content (namely that presenting a temporally extended portion of the world), a satisfying explanation of the phenomenal character of the t-event may arise simply by appealing to accuracy-conditions; awareness relation to a mind-independent portion of the t-event; awareness of a sense-datum in virtue of which the t-event is perceived; temporal mental paint/qualia and so on, and so forth. In other words, the debate within the specious present theories is just a fake debate: it all boils down into the old-fashioned debate about general perception.

As far as I can see, this is where Christoph Hoerl (2017a) himself tries to go when he suggests that, in the end, this is true: the demarcation between Retentionalism and Extensionalism just is the demarcation between Representationalism about time and Naïve Realism about time respectively. We have already seen the reasons he offers for the retentionalist to be committed to Representationalism:

> "There is an intuitive sense in which past events are simply no longer around to figure as constituents of our experience in the way envisaged by the relational view. For us to continue to experience events after they have ceased to impinge on our sense, and to experience them as something other than present, our perceptual system itself would have to modify the way in which they are experienced from how they were experienced when we first

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[145] Please notice that the last two are relational properties, like temporal ones.

encountered them in experience, which is at odds with the idea that its sole role is to put us in a relation of acquaintance with objects of experience, and that is these objects that account for the specific nature of individual experiences. [...]

For the same reason, I believe, a retentionalist account of temporal experience has to involve an approach to the nature of perceptual experience that differs from the relational or object view." (Hoerl 2017a: 177-8).

Here two points Hoerl (2017a) underlines: 1) there is an *intuitive sense* in which objects (or t-events phases) in the past are no longer around to be perceived, 2) it is necessary to perceive them in a different way from the present, otherwise we would encounter them in the same *way* in which we have encountered them before. That is to say there would be no significant difference between the way in which an object is presented in the previous and in the following windows. Again, this seems to assume that Retentionalism is Tense Retentionalism, since we are saying that an object can be represented in different *ways,* i.e. temporal modes of presentation, in different windows. As we know, Tense Representationalism is immediately committed to Representationalism: indexes and tenses require *accuracy conditions*. Thus, if "Retentionalism" is interpreted as "*Tense Retentionalism",* I agree with the diagnosis: it is representational. However, the aim of the chapter is to defend a tenseless version of Retentionalism, which is not immediately committed to Representationalism.

As far as Extensionalism is concerned, the relevant thought by Hoerl (2017a: 178-80) can be summarised as follows: Representationalist Extensionalism is charged of vehicle/content confusion (for ex. by Tye 2003). This because it assumes that the temporal structure of the vehicle has an explanatory role at explaining the phenomenology of t-events. There are two options to meet the challenge: either 1) the extensionalist has to provide more reasons why time is special in order to legitimate her position or 2) she has to reject what Hoerl takes to be the "relevant" content/vehicle distinction which, by Hoerl's light comes to be proper of Representationalism and incompatible with relationalist views like Naïve Realism. Hoerl goes for 2) and concludes that Extensionalism is an anti-representationalist theory. The reasons to reject option 1)

are the following. In allowing that Extensionalism admits properties of the vehicle to have an explanatory role, it becomes similar to a Resemblance Theory (section 2.2.1):

> *"Even more to the point, the resemblance theory of temporal experience appears explanatorily vacuous. As with resemblance theories of experience in general, it faces the obvious problem that it seems to presuppose what it is trying to explain. In assuming that a resemblance between temporal features of our own experience and temporal features of the world can be made to do explanatory work in accounting for our awareness of the latter, it seems to take our ability to become aware of the former for granted. For the succession of our own experiences to explain our awareness of temporally extended goings-on, it seems, we would have to have a way of becoming introspectively aware of that succession as such, i.e. not just successively becoming aware of each experience in turn, but becoming aware of their succeeding each other. And it is not at all clear that it is any easier to account for our introspective awareness of temporal features of our own stream of experiences than it is to account for our awareness of temporal features of the world presented in experience. In fact, we have made no progress in explaining how an awareness of succession is possible. (Hoerl 2017a: 179)*

This is the charge we encountered in section (2.2.1) against Chuard's (2011,2017) deflationist model. The thought is that Extensionalism, if not coupled with Naïve Realism, is doomed to the same explanatory-vacuity charge of the resemblance theorist. Thus, all the dialectic by Hoerl could be the following:

THE HOERLIAN DEBATE:

1) Retentionalism has some distinctive problems that can be solved just with modes of presentation (or tenses).

2) Modes of presentations (or tenses) commit to Representatationalism

3) Therefore, Retentionalism is necessarily representationalist [because of 1 and 2]

4) Extensionalism has Resemblance Theory-like problems that can be avoided only by rejecting the relevant vehicle/content distinction

5) The vehicle/content distinction (in the relevant sense) is pertaining only to the Representatationalism

6) Therefore, Extensionalism is necessarily an anti-representationalist (relationalist) theory [because 4 and 5]

7) Therefore, the debate between Extensionalism and Retentionalism boils down in the debate between Representationalism and Anti-Representationalism in general philosophy of perception

I do not find myself completely in agreement with this interpretation of the debate. Let us assume that a Broadly Externalist Tenseless Retentionalism is viable in virtue of what I said throughout the chapter: is there anything incoherent in the idea that a subject is in a certain brain configuration at t (serving as the neural realisers/vehicle of the perception) enabling her to be in an awareness relation with an interval dt including t itself[146]? After all, in assuming as every physicalist should do, that the time in which perception occurs is the time of the neural realiser (*i.e.* the vehicle in *my* sense), it becomes up to the retentionalist to interpret the perception as involving or not accuracy conditions as the externalist representationalists do[147]. Otherwise, one may assume that this phenomenology does not involve any accuracy conditions and go for a full blown, naïve realist conception of perceptual experience. As far as I can see, a line of reasoning of this sort can be accepted also by a champion of Naïve Realism like John Campbell (2002: 118):

> "Without the cognitive processing there would be no experience of the objects […] But without the objects, there would be no experience of objects either. On the Relational View of experience, we have to think of experience of objects as *depending jointly on the cognitive processing and the environment*" (Campbell 2002: 118, my italics)

Thus, a content/vehicle distinction, where this is meant to be a distinction between the cognitive/neural subpersonal processing enabling the perceptual experience (vehicle) and the content (the mind-independent object) is available also for the Naïve Realist. Thus, contrary to premise 5, I am specifying another sense, in which the vehicle/content distinction may be of help here.

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[146] Another way to see the issue is to press the point that there is nothing in Naive Realism that necessarily commits us to see the conscious relation as unfolding in the way described in 3.2.4.

[147] The easiest way is to interpret contents in a Russellian way, by assuming that perception involves grasping truth-valuable propositions, which are constituted by real objects in the environment.

My suspect is that Hoerl has in mind a different notion of vehicle/content distinction, one which is close to Representationalism declined internistically. So, Hoerl's considerations are calibrated over those representational theories which are committed to indirect realism: the idea that our introspection reveals internally realised property, in virtue of which, we become aware of things outside. I guess that he interprets "vehicle" as referring to these phenomenal properties, and "content" to be the object they refer to. But this is not how, the first people introducing the distinction, Dennett and Kinsbourne (1992), decline the distinction itself.

Finally, with the Dennettian distinction vehicle-structure/content-object, I would like to make an attempt to block the charge of explanatory-emptiness to Representational Extensionalism (which would follow if the reading of the "vehicle/content distinction" were the one I attribute to Hoerl himself). So, let us come back to Hoerl (2017a) once again:

> " In assuming that a resemblance between temporal features of our own experience and temporal features of the world can be made to do explanatory work *in accounting for our awareness of the latter, it seems to take our ability to become aware of the former for granted.* (Hoerl 2017a: 179, my italics)"

I would propose to drop the claim that *the awareness of* the temporal structure of the vehicle has an explanatory role in accounting, extensionally, for the phenomenology of change. It is the temporal arrangement of the vehicle (rather than my awareness of it) that has this role. As we said in section 3.2, Extensionalism is a Time as Its Own Representation View. The temporal arrangement of the vehicle may have an impact on the represented phenomenal character even though it is not manifest in our introspection. It constraints the phenomenology of a t-event without being the introspectively accessible property. The most straightforward analogy is with language: "John loves Mary" is different from "Mary loves John". Basically, the explicit constituents of the vehicle (the sentence) are the same, but the meaning is completely different. Why? Because the internal arrangement of these constituents constrains the meaning, even though there is no constituent that explicitly refer to the direction of the love

relation[148]. The same should be true for Extensionalism in respect of temporal properties: the temporal arrangements of the vehicle may have an explanatory role at determining the content even though they are not explicitly part of the vehicle. I like to say that metrical mirroring makes temporal properties to the vehicle *transparent to themselves*. With a metaphor: Extensionalism is like a performed play from the point of view of the actors. The temporal arrangement of the narration is given in virtue of the temporal sequence of the actions performed by people on stage. But as an actor, I do not have to perceive the sequence in order to make up the temporal arrangement of the narration. I have to *create* the temporal arrangement of the narration, by performing the sequence. I, as an actor, I am the vehicle for the narration. In this metaphor the actors are the vehicles realising the narration (the content) for the introspective access represented by the audience[149]. In case of perception, I *create* the felt temporal arrangement of a t-event, by undergoing the perception of its phases. Then it is true that if I undergo "A before C before B", instead of the correct "A before B before C", the representation is inaccurate. But, in a Phillipsian (2014a) spirit this is not a problem for Extensionalism as long as the perceived sequence "A-C-B" is enabled by the following succession of perceptions "e(A),e(C),e(B)"rather than "e(A),e(B),e(C)". Out from the metaphor, in a representationalist-externalist framework I have not to be aware of the temporal properties of the vehicle to perceive t-events outside. I have to be aware t-events outside, in virtue of the fact that the vehicle unfolds in a certain way.

So, my friendly advice to the Extensionalist is to buy a different notion of vehicle/content and go for the proposal 1) by Hoerl, namely to provide independent reasons to state that it is not a vehicle/content confusion the idea that perceptual experience has the same properties of what it represent. Indeed these independent reasons are exactly the reason why the debate between Retentionalism and Extensionalism is interesting in the very first place: as Phillips (2014a) maintains both vehicle and contents have temporal properties, and the debate is exactly how the properties of the "hidden structure" or vehicle affect the introspectively manifest phenomenal character. The name "hidden structure" is from Power (2018):

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[148] Cf. Perry's (2013) unarticulated constituent.
[149] If you think that the metaphors hide an homunuclar view, you can replace the human actors with fully unconscious robot-actors.

> "By 'representational structure', I mean the elements, properties, and relations that are necessary and sufficient for perceptual experience to represent something. I assume that we may also call this the structure of the representational vehicle. It would be a mistake to call it the representational content of perceptual experience. The difference between the vehicle and content is why I consider any representational aspect of perceptual experience to be hidden (and intentional). (Power 2018: 65)"[150]

The point of the hidden structure (call it representational or not) is that it usually does pose constraints on how things appear to us, namely on the phenomenal character. It is widely accepted that vehicles do not have the same properties of their contents. Temporal properties are different: because both PPC and PSA impose different constraints on how things appear, even though the temporal properties of the vehicle are hidden, even though we are not aware of them, even though there is not a dedicated syntactic token.

Of course, not every combination between theories of general perception and theories of t-events perception is possible, as the case of Tense Retentionalism demonstrates. But the point I want to make is that the debate about temporal properties perception is still more interesting that the old debate about general perception.

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[150] I find it interesting that all Power's (2018) monography, *Philosophy of Time and Perceptual Experience,* is an attempt to understand how different metaphysics of time affect the naïve realist position he endorses. Nevertheless, he still admits the possibility of this hidden structure that does not constrain how things appear (with the visible exception of temporal properties).

Chapter 5: The Experience of Time

The main topic of this dissertation has been the analysis of our ability to perceive *temporal properties* (order, succession, duration, simultaneity) of t-events outside. Following the paradox of temporal experience (Kelly 2005), we elaborated a Tenseless Retentionalist theory apt to adequately capture their phenomenology. This ultimately is the perception of the diachronic relations constituting temporal properties within a specious present. A rather different question (although, as we will see, it is often conflated with the former) is how to account for the experience of *time per se* (i.e. for the passage of time and for the privileged status of the present moment). Thus, we are not interested in objects that change, move or persist. Our focus will be now on how *time itself flows and the privilege of the present* (from here on, "features of time"). Indeed, according to many philosophers like Baron (2017), Dainton (2011a, 2011b), Prosser (2012,2013,2016), Paul (2010), Skow (2011), Torrengo (2017) the perception of *temporal properties* of t-events does not exhaust what may be called our *Experience of Time*. Something more has to be said in order to give a complete account of our phenomenology in respect of the features of time.

As we will see in 5.2, the reflections over our phenomenology of features of time have a relevant impact over a particular metaphysical debate, namely the one between the A-theory and the B-theory of time. Since we will be referring a lot to these two conceptions of time throughout the chapter, it is useful to spell them briefly out from the beginning.

The contemporary debate about the nature time is shaped after the article of John Ellis McTaggart, "The Unreality of Time" (1908) and his book "The Nature of Existence" (1900). He draws two possible ways to ordinate events in time, either by appealing to the A-series (i.e. the series generated by the change in which events are past, present and future), or by appealing to the B-relations (i.e. the series based on the ordering of events according to relations of earlier and after). Based on the distinction of the two series, two metaphysical theories about time have been developed: the A-

theory and the B-Theory. Both agree that time is real, but they disagree on its nature[151].

According to the A-theory, different chunks of reality enjoys tense properties (also called A-properties) like *"being-present", "being-past"* or *"being-future"* at different times. Thus, roughly I am writing this page on Monday the 17th of June 2019 at 17.10, thus every chunk of reality occurring on Monday the 17th of June 2019 at 17.10 enjoys the property of *being-present.* Then, intuitively, every chunk of reality on Monday the 17th of June 2019 at 17.11 becomes *present* and so on and so forth. The tenseless relations ordering the reality *are in some sense dependent on* the A-properties, which are monadic. The variation of the distribution of tensed properties bring about the flowing-like character of time[152]. Let us call this "robust passage" (Deng 2017; Skow 2015).

The other main metaphysical theory of time is the B-theory. In this framework, there is no substantial difference between past, present and future: all events are equally *real* and they exist. The reality is ordered on the basis of tenseless relations like *"before of"*, *"after that"*, *"contemporary to"*. In the B-theory time does not pass. Indeed the "now" or the "present moment" are just indexical notions which do not pick up substantive metaphysical properties, as in the case of the A-theory. As indexicals, they have a meaning only by picking up the location of time occupied by the speaker or thinker. *Mutatis mutandis,* the same follows for the other tensed morphemes. In other words, a certain moment is present in the B-theory because we are occupying it rather than *viceversa*.

Finally, the received view about the debate may be summarised as follows: The A-Theory is intuitive and (I dare to add "because") it is motivated by the Arguments from Phenomenology (section 5.2), the B-theory is counterintuitive and its motivated by

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[151] This is contradiction to what McTaggart (1908) himself thought about time, since he believed that time was not real in the first place.

[152] This is the version of the A-theory corresponding to the contemporary "moving-spotlight theory" (Cameron 2015), which is probably the closest A-theory to what McTaggart had in mind. Some adjustments are required for Presentism and Growing Block, the other main A-Theories. These theories do no share with the Moving Spotlight the idea of Eternism (all past, present and future exist), since they assume that only the present exists (presentism) or that only the present and the past exists (growing block). However, nothing substantial has to be added for the point I would like to make here: since the difference in distribution of the A-properties can be seen as the difference in which moment is the present moment, a difference admitted by all the A-theories.

considerations from contemporary physics, especially General Relativity (Power 2018)[153].

This is the metaphysical background. However, a peculiarity of this metaphysical debate is that some of the participants, the A-theorists (*e.g.* Baron 2017) claim that the perception of the features of time would favour their theories[154]. This for the trivial reason that the A-theory naturally poses a flow and a privileged present and the B-theory does not. Moreover, also several authors in the B-theoretical camp (Torrengo 2017, but also Dainton 2011a, 2011b, Paul 2010 and Prosser 2016) ultimately claim that the belief that time passes is widespread and this has a lot to do with the way in which we perceive the features of time. This chapter will be devoted to these elements.

5.1 What is at issue

5.1.1 The Beliefs about the features of Time and the Origin Problem

Sometimes the debate between the A-theory and the B-theory is framed in terms of objective spatialisation of time. The idea is that according the B-theory, time is very similar to space in its structure, while according to the A-theory this does not hold. For example, in the *Stanford Encyclopedia's* entry about *Time:*

> "According to The B Theory, time is very much like the dimensions of space. Just as there are no genuine spatial properties (like being north), but, rather, only two-place, spatial relations (like north of), so too, according to the B Theorist, there are no genuine A properties. According to The A Theory, on the other hand, time is very different from the dimensions of space. For even though there are no genuine spatial properties like being north, there are, according to the A Theorist, genuine A properties; and time, unlike space, can truly be said to pass, according to The A Theory." (Markosian, Sullivan, and Emery 2016)

Analogue remarks can be applied for our *conceptualisation* of time. Indeed, our cognitive systems may induce us to think about time is a way akin to space or, in alternative, to take time as very different than space by default. This latter position,

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[153] An assessment on how to articulate the Arguments from Phenomenology in front of the Argument from General Relativity can be found in Baron (2017).
[154] Even though there are A-theorists like Tooley (1997), Deasy (2015), Tallant (2014) that do not think that phenomenology favours their view.

which is part of the received view on the phenomenology of time features, is the starting point of our enquiry.

Some linguistic expressions in English point to this direction indeed: "A lot of time has passed since then", "The weekend passed quickly" "Christmas is coming" make perfectly sense. "A lot of space has passed since there", "The area passed quickly", "Italy is coming" strike us as very odd. Antony Galton (2011) devoted a paper on this aspect. He claims that there are several limits to our ability to conceptualise time with spatial means. Galton individuates a *transient* aspect of time, which is not shared by space. In other words, we speak about time as if it moves or change[155]. Since nothing like that happens in the case of space, this is the prove according to Galton that our conceptualisation of time has limits. That is to say, we take time to be different than space in a relevant respect, which would be ignored if we conceptualised time in a way that fully mirrors space[156].

From analyses along the line of Galton's, the received view about the phenomenology of time assumes that the beliefs about the *flowing character of time* with no spatial equivalent are ubiquitous (cf. Torrengo 2017, Hoerl and McCormack 2018). According to the received view indeed, these beliefs are grounded in our perceptual-like states: thus, we believe that time passes because we have a perceptual experience of some sort *as of* the time passing. Here some of the *Loci Classici* of the received view:

> "...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)

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[155] Galton assumes that both "ego moving metaphors" and "time moving metaphors" disclose the transient character of time. We will see in section 5.7 that this is not so simple.

[156] As we will see in section 5.7, the analysis by Galton is of little or no use, although it is often appealed to in order to make the case of a difference in our we interpret time in a cognitive of time. It presupposes exactly what we are trying to dismantle here: a perceptual phenomenology of time. The same considerations follow for the other overquoted book defending the universality of the belief of an objective time-flow, namely Gell (1992).

"There is hardly any experience that seems more persistently, or immediately given to us than the relentless flow of time." (G. Schlesinger, 1991: 427)

"I find it impossible to relinquish the sensation of a flowing time and a moving present moment. It is something so basic to my experience of the world that I am repelled by the claim that it is only an illusion or misperception. It seems to me that there is an aspect of time of great significance that we have so far overlooked in our description of the physical universe." (Davies 1995: 275).

Thus, according to these authros, we tend to believe that time exhibits the flowing or transient character, because the latter is a *real* feature of our perceptual acts. In other words, the received view is about everybody's default preference for the A-theory.

This overall picture has to be treated with caution. The first thing to bear in mind is that the dialectic conducted so far is more controversial than it seems. Indeed, we started with the idea that temporal properties (order, duration, succession, simultaneity) do not complete our phenomenology of time and this requires an explanation. Then, we suddenly spoke about the beliefs about the difference between time and space whose explanation is due to the presence of this alleged phenomenology of flow. Therefore, it seems that we have two *explananda*: the beliefs about the flow (where do they come from?), and the alleged extra element in our perceptual phenomenology which possibly completes, together with temporal properties, our phenomenology of time (where does it come from?).

The task of giving an explanation of *the belief* of the flowing-like character of time is called the "*origin problem*" (Torrengo 2017). Whilst the standard formulation of the origin problem is about the transient character of time, it may come in slightly different fashion. One may assume that the belief that time flows typically comes with the A-theoretical beliefs that 1) there is a metaphysically privileged moment in time, and that 2) metaphysical privileged moment *changes*. In other words, one may formulate

the origin problem in terms of the beliefs about both *features of time,* rather than the flowing-like character only[157].

One option to deal with the origin problem, the one of the received view, is to state that these beliefs are grounded in our perceptive states. They are so, in the same way in which we believe that apples can be red or yellow, because we have seen red or yellow apples. I will refer to such family of views as "*perceptionism*". Indeed, setting aside any epistemological issue about the reliability of perception, it is quite uncontroversial that in many cases we come to believe so-and-so, because our perception informs us that the world is so-and-so arranged. Thus, the admission of the extra component of our perceptive phenomenology has primarily the purpose to explain why we have these beliefs about the features of time in the first place. However, if we take that *there is* a perceptual element that discloses the features of time, then we are in charge to explain by what this extra element is caused. Plausibly my perceptual experience of red is caused by the fact that a red apple is in front of me. The same inquiry can be made, with less trivial outcomes, for the phenomenology of the features of time. Some options are on the table here: A-theoretical distributionism, B-theoretical illusionism (Prosser 2012; 2016; Paul 2010; Dainton 2011a, 2011b) and the Phenomenal Modifier View (Torrengo 2017). These will be better explained in sections 5.4 and 5.5.

The other option is to state that these beliefs do not come from perception, since the latter does not present us with anything like the sense of privileged present or the feeling of the flow. So, the beliefs about the features of time can arise by inference from other beliefs, by a mechanism (K. Miller 2019; K. Miller, Holcombe, and Latham 2019) or by some kind of error (Hoerl 2014, Deng 2013a). I will indeed refer to this position as "Cognitivism"[158] about the phenomenology of features of time. This suggests that the

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[157] As we will see in section 5.7 it comes to be an empirical question whether those beliefs are so widespread and stable. And there is no empirical study yet that directly address the issue (K. Miller, Holcombe, and Latham 2019).

[158] The label "illusionism" has been taken from Baron *at al.* (2015). They refer to the family of positions I dubbed as "cognitivism" with the more common label of "veridicalism". Indeed, they take the key point of cognitivism to treat our perception of time as veridical, in a sense that will be clear in the next section. However, we will see, also an A-theorist can maintain that our perceptions about time features are veridical and a B-Theoretical proposal like Torrengo's can still maintain that we have veridical perceptual content. It is not a case that Torrengo (2017) uses the label "deflationism" to refer to "cognitivism", however I won't use "deflationism" in order not to create confusion with the deflationist models discussed in chapter 2. Moreover, I believe that the label "cognitivism" better captures the idea that the explanation of our beliefs about the features of time does not involve perceptual acts.

explanation of the beliefs of a privileged present and of the flow is not grounded in perception. Strictly speaking, Cognitivism is neutral with both an A-theory of time and a B-Theory (whilst, as it will be clear in the next section, the orthodoxy is the B-theoretical version)[159]. It has to be noted that the origin problem itself has been designed to put pressure on Cognitivism. Indeed, since it is customary in analytic philosophy to take the beliefs about the features of time to be widely widespread (Baron et al. 2015; Torrengo 2017; K. Miller, Holcombe, and Latham 2019; Hoerl and McCormack 2018), their pervasivity and the fact that they are immediately given (rather than the product of a line of reasoning) suggest that they are like those beliefs grounded in perception. Thus, *prima facie,* the perceptionist has the higher ground in respect to the origin problem.

5.1.2 Three preliminary points.

Before moving on, three clarifications are at issue. The first is that the way of speaking of LePoidevin (2007), Davies (1995) and Schlesinger (1991) is very ambiguous. Indeed, they do not refer to perceptual experience in particular, even though this is the most natural way to read them. They refer to experience in general, leaving it open on whether time discloses itself in any phenomenal state. A few philosophers (Torrengo 2017, Dainton 2014a) maintains so, but the possibility to enlarge the set of states disclosing the features of time has little or no relevance. This because only perceptual states are able to ground the beliefs relevant to the origin problem. We have to bear in mind that these beliefs incline us to entertain a narrative about reality as arranged in a way different than space. That is to say, we take that the flowing character and the privileged present are properties of the world. So, the phenomenal states grounding the relevant beliefs must be states which normally give us a grip on the world.

This is point is important because, as we have seen in section 5.1.1, the debate is framed in terms of whether our phenomenology of features of time is linked to perceptual acts and/or contents rather than some other higher-level mechanism. However, Torrengo's (2017) own formulation of the origin problem opens up for the possibility that the relevant beliefs be grounded in all phenomenal states, not just

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[159] Whilst he is not an A-theorist himself, Bradford Skow (2011, 2015) explores a broadly A-theoretic cognitivist option.

perception. In what follows I will show why, contrary to what Torrengo himself suggests, it is only perception that matters for the origin problem. So, let us analyse other paradigmatic phenomenal states, like emotions and imaginations. In the case of imaginative acts, we can entertain the history of Othello and his love for Desdemona. Whilst we can imagine them vividly, we do not believe that either Desdemona or Othello exist[160]. As far as emotions are concerned, evaluative properties (formal objects) are usually in play. It is widely debated if these properties are part of the ideology of the world or not, and realism is not the standard stance on these properties (Deonna and Teroni 2012). One may reply that also memories can ground beliefs about how the world is in the same way than perception. This is true, but just because episodic memory is a recollection of an act of perception occurred in the past. It is perception-like (and the same goes for anticipation). So, the *first* point here is that perceptions are the only states relevant for the origin problem.

The *second* point is that since we are speaking about perception, all our discussion about the specious present and the temporal structure of perceptual vehicles comes in play here. The influence of the debate on the Paradox of Temporal Experience over the debate about the perception of the features of time has been appreciated just by a few (*i.e*. Dorato 2015, Frischhut 2017).

The *third* and final point is that one of the main arguments exploiting the different psychological attitudes toward time in order to derive metaphysical conclusions is Arthur Prior's (1959) "*Thank goodness that is over*". As it is known, Prior makes the case for the existence of a necessarily privileged present by considering an utterance like "Thank goodness that is over". Following Prosser (2016) we can flash out Prior's suggestion as follows. On Monday I feel fear because I have a canal surgery the day after. On Wednesday, I feel relief, since "Thank goodness that is over". The case is meant by Prior to be a counterexample for the B-theory, which considers everything

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[160] Torrengo (personal communication) would insist that it is possible to conceive that some beliefs are grounded in imaginative acts. Probably, a great mathematician can discover new geometrical truths by visualising new figures. I can grant that, but since we are discussing a non trivial case rather than those of the ordinary kinds of imagination, the point about the *immediate character* of the beliefs at the base of the origin problem gets weaker. For example, the mathematician has to know that geometrical truths can be discovered in this way, in opposition to other kinds of truths etc... The relevant beliefs are not immediately grounded: further beliefs about the nature of geometrical explanations are needed in this case.

happening on Monday, Tuesday and Wednesday to be equally real. Indeed, if these moments were equally real, our psychological attitudes like thankfulness and relief about certain moments should be nonsensical, or so Prior concludes. I am not interested in saying whether Prior is successful against the B-Theory. I think he is not, but it does not matter here. I want to suggest instead that Prior's argument does is not refer to any *perceived* privileged present. As both Sider (2001) and Prosser (2016) point out, the argument by Prior makes hidden reference to indexicals. On Monday I know that my surgery is the *day after*. On Wednesday my relief is linked to my knowledge that the canal surgery was the *day before.* Thus, my psychological reactions, fears or relief, are appropriate in relations to cognitive states like beliefs and thoughts involving temporal indexicals. For our purposes just one thing matters: fears and relief are not appropriate in respect to tensed *perceptual* acts. Given that they are appropriate relatedly to *cognitive* states instead, we cannot impute the phenomenology of privilege to fear and relief. This because, firstly, the "origin problem" requires that the relevant beliefs are grounded in our perceptual states rather than relief or thankfulness. Secondly, it seems that the cognitive states to which relief and thankfulness are anchored are the relevant beliefs to be explained in the first place.

5.2 The (Many) Arguments from Phenomenology

Taking all the pieces together, it comes to be clear why a conspicuous body of literature has been devoted to this extra ingredient of our perceptual phenomenology, namely the perception of both *features of time*. The beliefs about the features of time are those at the basis of the A-theory of time, which is the idea that there is a metaphysical privileged moment, *the present*, and there is a change in which moment *is/was/will be* the present. Again, intuitively Saturday July 13, 2019 at 15:54 is the present moment, then Saturday, July 13, 2019 at 15:55 will be the present moment, while Saturday July 13, 2019 at 15:54 will be past, and so on, and so forth. This change in the present moment constitutes the flow of time. And this flowing character is supposed to be captured by our perceptual phenomenology, which therefore leads us toward the A-theory. Different formulations of the argument from phenomenology can be found in LePoidevin (2007), Paul (2010), Baron *at al* (2015), Baron (2017), Frischhut (2015), Skow

(2011), Balashov (2005). The majority of the formulations focuses on the transient character of time. I propose Natalja Deng's (2017) argument *from the flow* (which is taken from Baron *at al* 2015 in turn):

1) We have experiences as of time (robustly) passing.

2) If we have experiences as of time (robustly) passing, then any reasonable explanation of this relies on the (robust) passage of time being an objective feature of reality.

3) Hence, the (robust) passage of time is an objective feature of reality. (Deng 2017: 240)

In Deng's terms, the insistence on the robust passage of time has to be understood as the statement that our perception delivers us a sense of passage which is not akin to the "anemic" passage of the B-thoery. According to the B-theory indeed, the passage of time is just a succession of instants, which are in the content of subsequent acts of perception. By the lights of the A-theory, time passage involves a sort of a change in the metaphysical privilege. How exactly making sense of the metaphysical privilege depends on the version of the A-theory under scrutiny. A certain portion of reality is privileged because it is all what exists (Presentism), it can be the last edge of what is real (Growing Block), it can be simply the part of reality enjoying the property of *being-present* or *presentness* simpliciter, namely with no relativisation to instants (Moving Spotlight) (Deng 2017). To recap, every A-theory interprets the metaphysical status of a certain moment, the present, in a different way, but they all agree that there is a change in the portion of reality enjoying this metaphysical status.

A related (but different) question to the inquiry about our perceptual experience of the flow is how to make sense of the feeling of the present's *metaphysical status itself.* Actually, we have claimed that a sense of the flow has to be understood as the perception of a change of metaphysical status in reality. This brings about the idea that we indeed perceive that metaphysical status *in the first place*. So, there is a second argument from phenomenology, here is Akiko Frischhut's argument from presentness (2015)[161]:

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[161] Proponents of this argument are also Skow (2011) and Balashov (2005).

Argument from Presentness (AfP):

1) We have experiences as of events as A-present.

2) The best explanation for these experiences is that some things are A-present.

3) Therefore, some things are A-present.

(Fruschhut 2015: 151)

"A-present" is in Frischhut's terms the property of being objectively present, namely *presentness*. And again, the received view is that, since we perceive things as A-present, *presentness* is *a feature of reality*. This clarification is important because it spares us to introduce "*being-present*" as an indexical within our perceptual contents. So, it is logically possible to have both a sense of privilege and temporal transparency (cf. section 4.6). Indeed, the third argument from phenomenology is in the nearby.

Argument from transparency:

1) We perceive external things as enjoying presentness

2) Temporal transparency is true

3) Since temporal transparency is true, this sense of presentness cannot be attributed to indexes (or qualia or sense-data or any other property of the perceptual act)

4) This sense of presentness is not illusory

5) So, external things really enjoy presentness

6) Therefore, the A-Theory is true

This is not an inference to the best explanation. It is not for those accepting temporal transparency, like me. I argued in length in chapter 4 that 3 follows from 2. Since my sympathies are with the B-theory, I must deny that we perceive things as enjoying presentness in the very first place (against premise 1).

To recap, the A-Theory is often motivated by a cluster of arguments from phenomenology. These arguments purport to infer from some components of our

perceptual experience, namely the sense of flow and the feeling of presentness, that the A-theory is true. Before moving on, it is useful to make a further clarification: the issue about presentness is related but distinct from the issue of the flow. Indeed, some explanations of how the latter can arise without the former are on the table (section 5.5). Moreover, it is logically possible to conceive a frozen spotlight theory (cf. Cameron 2015, Fine 2005, see also Torrengo 2018a), in which only one moment is present and there is no change in presentness. Assuming that we can perceive only that moment, this would not bring about any change in metaphysical status, and thus neither flow nor sense of flow.

5.3 Tacking Stock

The picture is quite complex. There are many different elements in play. The first are the beliefs about the flow and the metaphysical status of the presentness. The origin problem pushes us to give an answer to the question of how one or both arise, since they are so pervasive. We can be either perceptionists (they are immediately generated from our perceptual acts) or cognitivists (some other mechanism must be in place). The majority of A-theorists has perceptionist inclinations: they claim that their theory is true because the two components of presentness and the flow are actually part of the content of our perceptions. However, both A-theoretical and B-theoretical perceptionists disagree on whether both features are part of our reality or not. Cognitivists are usually (but not necessarily) with B-theoretical inclinations and they think that the features of time cannot be perceived.

5.4 The A-Theory and the Paradox of Temporal Experience

Our starting point will be, once again, the Paradox of Temporal Experience by Sean Kelly (2005). Namely the question of how it is possible to perceive t-events requiring time to unfold, if we are presented only with instantaneous contents. The first point to make is that the instantaneity of the content is motivated by the idea that only things at the present moment exists and can therefore be perceived (See also APPENDIX2). In other words, a sort of Presentism has been assumed in its formulation. It is not by chance that the Specious Present Theories usually opt to drop it (section 4.5). In what follows, I will

analise some A-theoretical *perceptionist proposals*, i.e. some proposals claiming that it is our perception *strictu sensu* (without the intervention of some other cognitive mechanism) that delivers the phenomenology of the features of time.

5.4.1 Presentism: deflationist models or tense retentionalism

Given the remark about the presentist bias in the formulation of Kelly's Paradox, it is no surprise that most natural theory of t-event perception for the presentist is a form of deflationist model. Adopting a model of this kind may help somehow to understand in which sense the present moment is *perceived as privileged.* Of course, the sense of privilege cannot boil down to the perception that the present moment is the only existing (in contrast with past and future things), since this would be doubly problematic. The deflationist models are not able to accommodate the relational principle, according to which every relatum must be part of the same act of perception in order to be perceived (section 1.1). For cross-temporal relations this implies that past and/or future elements be part of the content but the instantaneity of the deflationist model, as we know, prevents it. However, the relational principle would be problematic in a presentist perspective also because past and future do not exist and, therefore, it is harder to make sense of the relation in the first place. The sense of privilege derives from the fact that only a certain moment can be part of our perceptual contents, and that moment is *the present moment*.

However, there are several concerns with this proposal. Firstly, as both Dorato (2015) and Frischhut (2017) suggest this position leads the presentist to the problems of the deflationist models about the lack of immediacy of the perception of t-events (section 2.1). Moreover, as Akiko Frischhut (2017) rightly points out, the same problem arises for the flow. It comes to be untrue that our perceptual contents come to represent time as passing[162]. Since the flow of time is, by definition, related to what happens at different times (It concerns what exist and what ceases to exist at different times), it cannot be captured by instantaneous content, presenting the world at a time. Thus, in order to have the sense of flow one has to add further mental faculties (for

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[162] Further concerns about the very possibility to have an account of perceptual content representing the flow based on the traditional theories of perception can be found in Braddon-Mitchell (2014).

example memory) or higher-order states (cf. Section 2.2.1) able to capture that different portions of reality existed at different times[163]. Regardless of the viability of the option, this has an obvious drawback: it makes the deflationist-presentist position collapse into a cognitivist-like kind of enquiry. So, it is not perception (alone) that delivers the sense of flow[164].

Secondly, some objections can also be advanced to the account of the sense of privilege proposed by presentists. The privilege should arise from the fact that what is presented to my perceptual content exists *simpliciter*, namely with no relativisation to a certain instant of time. However, it is doubtful that this is of any use from the point of view of perceptual content. To see why, it is better to assume a B-theoretical perspective for a while. One standard interpretation of a B-theory is that what is present is relativised to a certain moment in time, plausibly the time in which a certain perceptual act occurs. However, if the B-theorist avoids adopting indexes and tenses (as she should according to me), then there is no clear sense in which this relativisation of the present in respect to a time has to enter in our perceptual contents. In other words, every perceptual content, in both a presentist and a B-theoretical perspective, presents us with a portion of reality with no reference to which time the present moment is relativised[165]. Thus both the presentist and the B-theorist can agree that no relativisation is given in our perceptual content, since we are presented with contents that exist (at least in veridical perception), but disagree on the fact whether the present moment exists simpliciter or just in relation to the act of perception itself. If things are so, then there is no straightforward sense of privilege motivating Presentism in the first place.

A possible rejoinder is to insist that, even in a presentist perspective, we do enjoy things as *being-present*. Thus, the A-property of presentness enters into our instantaneous perceptual contents. There are easy counter-replies to this. They are based on the lack on contrastability of the A-property of presentness. In the underlying

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[163] Here I am simply rehearsing the Hoerl (2013, 2017a,2017b) kind of objection to Deflationism.

[164] Moreover, as both Frischhut (2017) and Dorato (2015) complain, this also take the allure of "Intuitivity" out from presentism.

[165] That is why I find puzzling both the proposal by Balashov (2005) and the discussion by Skow (2011). The point about privilege following the arguments from phenomenology is not about whether the present moment is relative to a certain instant/occurence of a perceptual act, but about whether this relativisation is indeed *perceived*.

deflationist perspective, we never perceive things *as-past* or *as-future*, every content at each time is thus perceived *as-present*. This for the obvious reason that according to Deflationism only one instant, i.e. the present, is perceived. Since there is no contrast case, it is unclear that we have tense properties in our perceptual contents in the first place: perceive something as present is the same as perceiving it *simpliciter*. One may adopt the suggestion that there is a contrast between a content which is perceived "*as-present*", and the same content which is remembered as "*having been present*". Presentness manifests itself as the difference of vividness between the two. But if so, it seems that the difference boils down in the difference between perception and memory in the first place[166]. Again, there are no intra-perceptual contrast cases to state that *within* a deflationist-like perceptual content there are A-properties in the first place. Moreover, the time lag cases also point into this direction: there is no phenomenal difference between an object, like a distant star, which is really temporally located in the past and an object in my nearby surroundings, occupying my same temporal location (Mellor 1998). Thus, not even contents in the remote past are perceived *as-past*.

To sum up, the point is the following: without clear contrast cases is difficult to make sense of our phenomenology of presentness in the first place. And this suggests that contents are presented to our perceptual acts with no temporal connotation. To put it crudely: it seems that "perceiving as present" is nothing over and above "to perceive".

Another option for the presentist is to adopt a specious present. However, since she needs a momentary act and a she cannot be directly aware of intervals, the only way to go is to adopt a an Almäng-style (2014) tense retentionalist perspective. In this framework, the temporal field of the specious present is oriented via indexicals and tenses, according to the temporal location occupied by the perceptual vehicle. These indexes allow the presentist to retain and anticipate contents which do not exist anymore. The problem with this route is that it falls victim of the Torrengo's (2018b) objection against the possibility of a *transient* flow starting from tenses. Torrengo points out that the orientation of the temporal field in a tense-specious present theory is

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[166] Cf. Frischhut (2015) for further objections to the vividness proposal.

analog to the orientation of the space in our ordinary visual experience. However, our being presented to contents to *our* left or *our* right does not give us the impression that space moves. This is true even if *we* move through space: the spatial orientation that is superimposed to our environment never delivers the impression analogous to the sense of passing of time. And indeed, we have not the same beliefs at the base of the origin problem. The acceptance of the analogy straightforwardly leads to the idea that occupying different temporal locations and orienting the temporal field as a consequence, does not bring about any sense of flow.

5.4.2 Growing Block and Moving Spotlight: the specious present and the A-Theoretical Distributionism

The remarks I have just given against Presentism, in both the deflationist and tense retentionalist fashions can be formulated, *mutatis mutandis*, also for the other two main A-theories, namely the Growing Block Theory and the Moving Spotlight. This because, ultimately the critical points regarding the sense of flow and of the privileged present are about the theories of t-events perception that are unable to deliver one or both of the phenomenology of the futures of time. To sum up, neither Deflationism, nor Tense Retentionalism are able deliver the content required by *perceptionists*[167]. However, accepting either the Growing Block Theory or the Moving Spotlight theory opens up for the adoption of other specious present theories, namely Extensionalism and my Tenseless Retentionalism.

The first point to make in this respect is that, surprisingly, the A-theorist should follow Hoerl (2018a) in claiming that the link between being presented to perception and being temporally present has to be dropped. Indeed, if we assumed that the portion of reality enjoying presentness is as long as the specious present, we will come with one of the two: either 1) the temporally *present* portion of reality is internally ordered in virtue of tenseless relations; or 2) something similar to the problem of the chord (section 3.3.1) occurs again. In this latter case, everything enjoying presentness occurs simultaneously, namely in the same instant. Unfortunately, admitting 1) brings about

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[167] As Dorato (2015) points out, it is *ipso facto* untrue that presentism is favoured by our perceptual phenomenology.

the collapse of the A-theory onto the B-theory (which comes to be more fundamental)[168]. So, the option is to admit that we have a specious present presenting us with different moments, only one of which is the present. Let us see the Moving Spotlight case, but the same considerations work *mutatis mutandis* for the Growing Block Theorist[169]. In this metaphysical framework it is possible to elaborate what I call the *A-theoretical distributionism,* which I take to be the most intuitive way to make sense of what A-theorists are trying to get with their arguments from phenomenology.

The core of the A-theoretical distributionism can be summarised in the two following tenets:

1) The sense of privilege is just the sense of presentness: my specious present window presents me with just one privileged moment in time which is the present among the other non-present (past and/or future moments).

2) The variation in distribution of the tense properties presented in each specious present window brings about the sense of the flow.
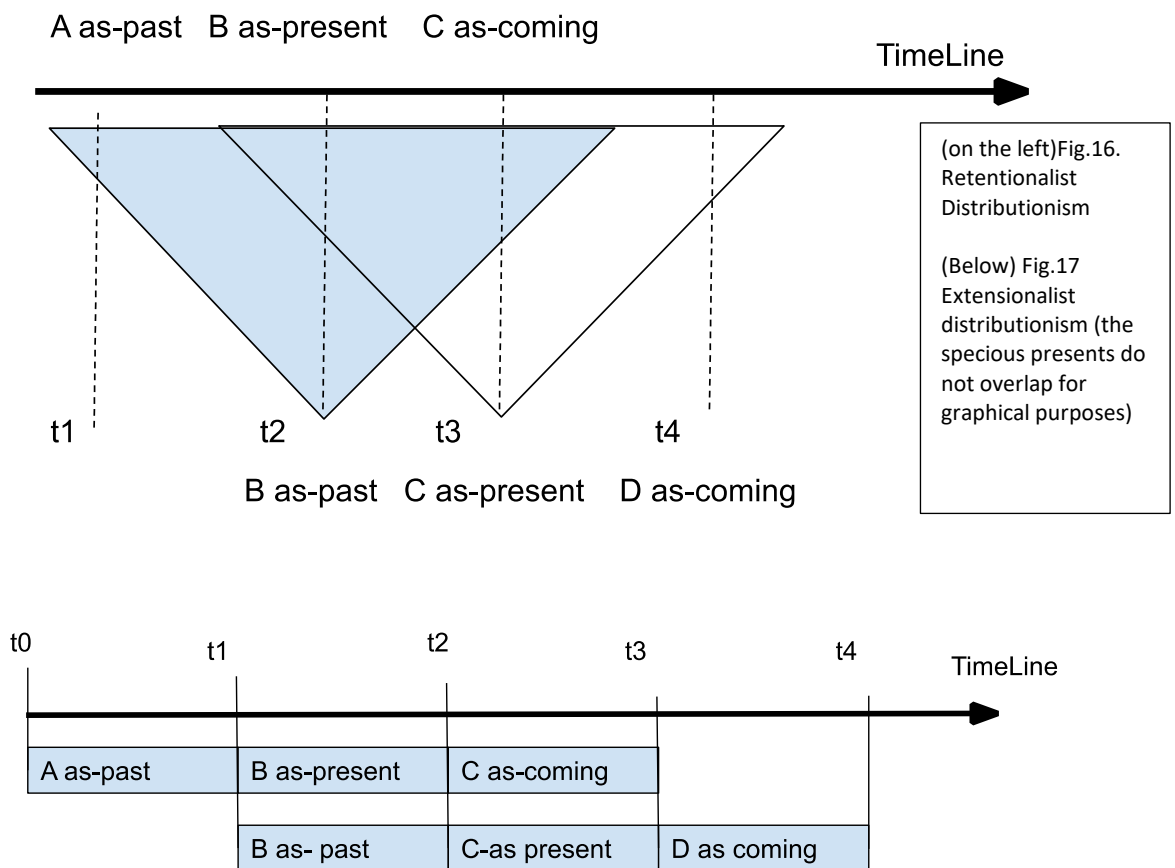
Both these assumptions can be challenged. Let us start with the second one. Contrary to what it seems, a specious present is not able to deliver the sense of flow in the same way in which it delivers the phenomenology of t-events. This is to say, a single act of perception may deliver the phenomenology of change, motion and persistence, but it cannot deliver the sense of flow in *distributionistic* terms. To see why, let us take a single specious present window (no matter whether it is realised extensionally or retentionally). Let as assume that it ranges from *t1* to *t3*. Content A occurs at *t1*, content B at *t2* and content C at *t3*. Moreover, let us grant the distributionist that we perceive "A *as-past"*, "B *as-present"* and "C *as-future"*. In order to deliver the sense of flow, in each specious present it should be possible to perceive the variation in distribution of the tense properties, thus within the same specious present. So, within the same perceptual experience *e*, we should assist to a change: we have to pass from *e*:[A as-

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[168] See Borgaard and Gatzia (2015) for a view of this kind. These considerations can also be extended to those who adopt an "extended" presentism.

[169] Please notice that the Growing Block must appeal to A-properties to make sense of the phenomenology of the features of time. If the claim is that the present is privileged just because it is the edge of reality, this would invalidate our perception of the sense of privileged. In such a framework we do have a specious present, whose latest instant is the present moment and it is filled by past moments. If these portions of reality did not enjoy any tensed properties, then there would not be any difference with a B-theoretical specious present, filing the window in the same way.

past, B as-present, C-as future] to *e*:[A as-remote-past, B as-past, C as-present]. But this cannot ever happen. And the reason is because, when content C becomes present, it means that the property of presentness has been transferred from everything occurring at *t2* (like content B), to everything occurring at *t3* (like content C). But, as we know from the previous chapters, also our perception (no matter how it is understood) occurs in time. Therefore, when content C stats being present, a new bit of perception starts to be present as well. In other words, a new window is created. And the new window spans from *t2* to *t4*, presenting an entirely new distribution of tensed properties (fig.16 and fig.17).

A as-past   B as-present   C as-coming

TimeLine

(on the left)Fig.16. Retentionalist Distributionism

(Below) Fig.17 Extensionalist distributionism (the specious presents do not overlap for graphical purposes)

t1   t2   t3   t4

B as-past   C as-present   D as-coming

The point here is simply that, since perceptual experience occurs in time, at any change in the distribution of tense properties it corresponds a change in the perception, rather than a perception of change of tensed properties. Things are different in the case

of t-events perception. Let us assume a tensed view for the sake of exposition[170]: in each specious present you may see a certain t-event phase to pass from *being-future*, to *being-present* to *being-past* exactly because it changes *in* time. Tensed properties constitute the structure of the specious present within which the t-event's unfolding may be perceived. Tenses cannot change within a specious present, otherwise it would be unconceivable the perception of t-events in the first place. Thus, the specious present theory is exactly in the same situation of the deflationist theory in respect to the flow. It is only via some higher-order, more "cognitive" comparisons between different windows that we come to believe that time passes. The flow is not given immediately in our perceptual contents. In the end, the flow could be given in our perceptual experience only if the latter took place atemporally, i.e. outside time. And it is absurd.

According to the first tenet, the sense of privilege comes to be just the perception of the present moment as enjoying a different monadic property (*presentness*) the other moments have not. The specious present has the main advantage of having the sources of accounting for the phenomenal contrastability of the tense properties: there are within perception different A-properties enabling the phenomenal contrast (cf. Almäng 2014)[171]. However, as Prosser (2007, 2012, 2016) rightly suggests, it remains doubtful that tense properties can be detected in the environment in the same way in which we detect colours and shapes. If tense properties behaved like other properties in the environment, there should be a causal relation between the tense properties in reality and our phenomenology (at least in the case of veridical perception). However, since according to the A-theory tense properties are necessary features of the reality, there cannot be a counterfactual case in which these do not occur and there is consequent a phenomenal variation. Thus, there is no way to make sense of the causal relations necessary for a full-blown perceptual act. If we take this discrimination between good and bad cases, based on the difference between causal and counterfactual scenarios, to be a necessary condition of perception, then it

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[170] Of course, if my Tenseless Retentionalism were true, there would be no perception of the flow at all.
[171] Almäng (2014) endorses Tense Retentionalism, so the phenomenal contrast he is concerned about regards the indexes within our perceptual contents. However, the same suggestion can be applied to A-theoretical distributionism.

cannot be the case that tense properties are a reasonable explanation of our phenomenology of the flow and privileged present.

Another argument by Prosser (2016) against the detection of the A-properties in the environment is the detector argument, according to which it is not possible to have a device able to be sensitive to their presence. The starting point is the admission that both the A-theory and a B-theory are metaphysical theories of time and they agree on the physical arrangements in the world. Given physicalism, they should agree also on the array of perceptual experiences occurring in our world. In a physicalist perspective our conscious experiences are physical entities, and therefore they should be the same under both a B-theory and an A-Theory. If some strong form of Dualism is in play, it still remains that our phenomenological reports are the same. This means that, no matter on whether physicalism, dualism, the A-Theory or the B-Theory is true: A-properties are not detectable o reportable. One may insist that even without counterfactual scenarios the best explanation is again to appeal to tense properties for our felt privilege. At this point the dialectic moves on whether tense properties are indeed the best explanation. I think they are not. More on this in section 5.7.

To sum up, if the considerations offered here are on the right track, then in an A-theoretical perspective, neither the sense of privilege of the present, nor the sense of flow of time can be straightforwardly attributed to our perceptual contents. This has two effects: on the one hand, it makes all the A-theoretical proposals close to a cognitivist enterprise in respect to the phenomenology of time. On the other hand, it casts even doubts on whether the A-theorist is the only reasonable and best explanation of our purported phenomenology of the features of time (if any).

5.5 B-theoretical Perceptionism

Following the remarks in the previous section, the A-theorist may choose to avoid *distributionism,* namely the idea that our sense of flow and privilege ultimately arise from the detection of tense properties in the environment and their variation. An A-theorist may adopt a more indirect strategy by claiming that our phenomenology of t-events would be very different if tense properties were not part of our perceptual

content. Thus, the strategy would be to claim that if we take seriously motion, change and persistence in a B-theoretical perspective, we would be delivered with a very different phenomenology of t-events from that we actually entertain. Surprisingly this strategy has been proposed by people like Dainton (2011a, 2011b), Paul (2010) and Prosser (2016), the B-theoretical illusionists, rather than the A-theorists. The challenge these authors have to address is to give an account of how our phenomenology of time is like. The obvious difficulty is that we cannot rely on the passage itself within our phenomenology: thus, we have to make the sense of temporal features intelligible without relying on the real flow in the world. This is called *intelligibility problem* (Hoerl 2014) and it has to be assessed if we admit that we do not directly perceive tense properties[172].

As the name suggests, illusionists claim that our perceptual contents deliver the sense of flow and privilege, but since they believe in the B-theory, they take these contents to be systematically false. We will see the versions by Dainton and Paul and the one by Prosser. We will conclude our analysis of Perceptionism with two non-illusionist proposals: the Phenomenal Modifier View by Torrengo (2017) and the account based on duration perception in section 5.6.

5.5.1 The Phenomenal Lubricant Hypothesis

According to what I call the *Phenomenal Lubricant Hypothesis*, even if they are not directly detected (and the A-theorist may accept the detector argument at this point), tense properties still contribute to our phenomenology in a different way, by giving our perceptual experience a *dynamic character* that would not be there otherwise. The assumption is once again that there is something more than our perception of t-events: this *dynamism* is the perception of the flow. Thus, we have Paul (2010):

> "[F]irst, for O to change from being P (at $t1$) to being Q (at t2.)> the
> event of O having P must become present at $t1$ and then the event of

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[172] Please notice the intelligibility problem affects also the A-theorist going in this direction, since she has to provide a way to understand how our phenomenology of t-events would be like, without the features of time.

O having *Q* must become present at time *t2* (while the event of *O* having *P* is not present at time *t2,*). Second, we detect this change in virtue of detecting its flow or dynamic character. Antireductionists infer from this that, for there to be real change, there has to be passage, cashed out as the successive nowness of different events moving from the future to the present and into the past. (Paul 2010: 343)"

According to Paul, the reason of the trouble resides in the way in which a B-theoretical change is conceived: it is an "*at-at*" passage from a certain portion of reality relative to a certain instant, to the following portion, relative to the following instant. Thus, in perceiving a t-event, we perceive a certain phase at *t*, and the change comes to be equal to perceive another phase at *t'*. Therefore, let us take the example of the ball rolling from L1 at t1, to L2 at t2: in a B-theoretical framework change in location is just the difference between the two "static" phases composed by the location L1 of the ball *at t1* and the location L2 of the ball *at t2*. However, in a B-theory the ball will be *tenselessly* at L2 at t2 and it will be *tenselessly* at L1 at t1: it will always be *frozen* in a static position. Tense properties would thus work as a "phenomenal lubricant" allowing the sense of *dynamism* that accompanies my perceptions.

Similar remarks are in Dainton (2011b):

"Since motion plainly does involve an object's varying its spatial location over time, its proponents maintain that the *at-at* view captures everything that motion invariably and essentially involves. It may well be that, from the perspective of physical theory, they are right about this. But the *at-at* view can also seem incomplete and inadequate: the claim that motion is in no way, shape or form an intrinsic feature of objects can easily seem entirely wrong-headed, if not entirely impossible to believe. The full story about why this is the case is no doubt a complex one, but one important element of this story is not difficult to discern: motion is something we can directly perceive, and the appearance of a moving object is (typically) quite different—intrinsically different—from that of its static counterpart. (Dainton 2011b: 127)"

I would like to stress some remarks. The distinction "static vs dynamic" in both Dainton (2011a) and Paul (2010) is very ambiguous (cf. Hoerl 2014). As we know from section 3.2.3, Dainton (2008, 2011a, 2011b) endorses the doctrine of *subjective*

dynamism, which is roughly speaking the idea that every perception on any kind presents *a content A before a content B*. Moreover, Dainton (2014a) subsequently opens up for a possible rejection of this doctrine, on the basis of a conceivability of an instantaneous world in which a certain kind of perception still occurs. That would count as *static*. In the same vein Paul contrasts the dynamism generated by the *apparent motion* with the *static character of the* momentary dot. So, it seems that according to both authors, what counts as "static "is what is *instantaneous[173]*. But if this is what they have in mind, then there is straightforward sense in which a B-theoretical world should be *static* as opposed to *dynamic*. T-events in a B-world are not instantaneous by definition, so they are not static. But, if so, it is not clear what the alleged dynamic character adds to the mere perception of t-events. This conclusion is also suggested by the way in which Dainton presents the example of the dog:

> "think of what it is like to see a succession of still images depicting a dog trotting along the street (e.g., digital photographs taken at one second intervals, say, displayed for a second each) with what it is like really to see a dog trotting down the street—or for that matter, the playback of a video recording of the same event. Self-evidently, the two courses of experience are vastly different: in the latter case we see a dog moving, in the former, a sequence of entirely motion-free images" (Dainton 2011b: 127)

If the deprived the dog's movement from its *dynamic* character, what remains is a sequence of snapshot-like dog-stages with no such a creature. Does it sound familiar? It seems just a re-edition of the Paradox of Temporal Experience, where the lack of dynamism coincides with the lack of unity among the *relata* of any temporal property. Thus, even if A-properties come into our perception as a "phenomenal lubricant" it comes to be unclear in what this "phenomenal lubricant" amounts to, if not

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[173] Actually, Laurie Paul tries to make a contrast case between "static" and "dynamic" based on the idea that if there were no qualitative change to contrast, then there would not be sense of passage (Paul 2010: 355). So, it seems now that the distinction static/dynamic Paul is after is nothing more than the distinction between change and persistence: if only persistence where in play, then there is no dynamism, according to her (see the next section for a reply to this line of thought). However, it should be questioned the intelligibility of Laurie Paul's intuition pump itself which asks us to imagine a world without t-events of change and motion (only persistence). This means that 1) we are not aware of our vital bodily changes (ex. the heart-beat), we cannot entertain different thoughts, 3) we cannot be aware that we have a succession of perceptions (even if they deliver the same contents). I simply do not know how to make sense of it.

the mere perception of t-events, we have discussed so far. Therefore, if this is the option for having the sense of passage, the sense of passage boils down in the perception of t-events with nothing more to add. In conclusion, the starting assumption that there is something over and above the perception of t-events in our temporal phenomenology is dropped[174].

One may try to give a more charitable reading at least of Paul (2010) by claiming that in some passages she points to the idea that the sense of the flow, *i.e.* the dynamic character of perception, is what makes a phenomenological contrast between change and persistence[175]. Two remarks in reply: firstly Hoerl (2014) is right, this is not a perceptionist project. Indeed, our perception gives us t-events of change, and we are mistaken in believing that that is the flow, rather than perceiving something over and above t-events. So, cognitivism comes to be true. Secondly, it comes to be untrue that we constantly feel the flow: in case of seeing persisting objects the sense of the flow should disappear. And this is not in line of what the argument from phenomenology tells us: the flow has to be always present.

5.5.2 Seeing Things as Enduring

Another idea to address the intelligibility problem (the problem of giving an account of how our phenomenology of temporal feature is like without relying on temporal futures themselves) has been advanced by Simon Prosser (2013, 2016). He takes advantage from the debate between perdurantism and endurantism, in which the former may be seen as the view admitting temporal parts for material objects and the second one as the theory rejecting temporal parts. Prosser claims that in a B-theoretical world one still see things as *enduring* rather than *perduring*[176]:

> "At this point it may be objected that the perdurance theory also holds that an object retains its identity through change; a single entity is temporally extended with an earlier part that is F and a later part that is not *F*.[18]But whatever the truth may be about the metaphysics of

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[174] Considerations following these lines can be found also in Hoerl (2014) and Deng (2013a).
[175] Interestingly, this marks the divide between Paul (2010) and Dainton (2014a) who gives dynamism also to persistence instead.
[176] This under the assumption, which is natural for a B-theorist according to Prosser, that things actually persist four-dimensionally.

persistence, I do not think that this adequately captures change as we experience it. Change is not experienced as an *F* temporal part succeeded by a *non-F* temporal part, with it somehow understood that both parts belong to the same composite whole; this does not correctly capture the phenomenology. Consider a spatial analogy in which a subject sees successive parts of a large object through a small window as it passes by. Suppose the object is red at one end and blue at the other; then the subject sees a kind of 'change' in the object's colour by first seeing only the red end then seeing only the blue end. But if the subject were aware of the circumstances the experience would not be of a change of the kind involved in seeing an object change colour over time; the subject would only be aware of an *at-at* variation across the spatial parts of a composite object. If the perdurantist were right then the phenomenology of temporal change should be at least partially analogous to this; yet it seems fundamentally different, involving no awareness of an articulation into temporal parts. (Prosser 2013:12)"

Prosser is clearly trying to solve the intelligibility problem by giving an analogy with space. Thus, we should think about our perception of a composite object at *t*, for example a classical blue-red eraser. We see that the eraser is blue *at* one region and red *at* another one. What Prosser is trying to get, as far as I can see, is that in that case we recognise the blue and the red rubbers to be *parts* of a whole eraser. Thus, they are perceived *as parts* of the eraser. In the temporal case, the two temporal parts of the blue and red object in the Prosser example are not recognised *as (temporal) parts.* Therefore, they are not perceived *as* temporal parts. In Prosser terms, this means that we perceive the things as *enduring*, rather than *perduring.* A possibility is to argue for an endurantist B-Theory. If that were possible, there would be no illusion of endurance anymore (cf. Hoerl 2014). I will not explore this possibility here[177].

However, it is questionable the relevance of endurance for the phenomenology of passage in the very first place. The first remark I would like to make is that, so far, we have spoken about the perception of t-events, i.e. events involving change, motion and

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[177] Indeed, much of the work to dismantle the illusory character of endurance depends heavily on the detail of the B-theoretical endurantism at issue. Indeed part of Prosser's (2016) idea is that there is contradiction involved in representing an enduring object changing (this because the same object would and would not enjoy the relevant property). So the B-theoretical endurantist running against Prosser should provide a version of her theory apt to avoid the contradiction generated by representing an enduring object changing.

persistence. To put it crudely, events *perdure* and I perceive the phases as belonging to the same t-event *as a composite* whole t-event. Thus, if I'm watching a football game, I perceive a certain arrangement of the players and the ball at a certain instant *to be part* of the whole game. The obvious reply on Prosser's behalf is to reduce the football game to a bunch of movements of the players and the ball, which are perceived as "wholly present material objects", to use the endurantist jargon, at each instant. My challenge would be to make sense of an extended tone, since we do not perceive it as "wholly present"[178]. Aside from the tone issue, it is Prosser in charge to demonstrate that there is a substantial difference between the perception of t-events and of material objects perduring. If there were such a difference, perhaps Prosser may be in position to deny that the perception of perduring objects delivers the parthood relation, contrary to the perception of t-events which deliver the parthood relation instead. I find utterly counterintuitive this distinction between perception of material objects and perception of t-events, since I take to be part of the perdurantist spirit the treatment of material object's life as if it were event-like. However, I concede this possibility to Prosser in order to make my following, second, remark.

The second remark is that either a Deflationist Model is true or one Specious Present Theory is[179]. If a deflationist model is true, then seeing things as enduring or perduring should not make a great difference: an instantaneous state of affairs is presented to our perceptual experience, and thus it cannot be the case that we see "composite perduring objects" regardless of whether endurantism or perdurantism were true. The only difference would be that, if Endurantism were true, when seeing a ball rolling, we would be presented with instantaneous states of affair of the same ball at different times, whereas If Perdurantism were true, what we are presented with numerically distinct temporal parts of the ball. But it is hard to understand in which sense "this" difference between instantaneous perceptual experiences could be captured at the phenomenal level. Indeed, if a deflationist model is true, the difference

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[178] Many thanks to Christoph Hoerl for underlining this point to me.

[179] Of course if one is skeptical about the nature of the specious present debate, she can try to reformulate illusionists ideas in terms without relying on instantaneous contents or the specious present. However, she has to take into account a theory of perception of some sort, since, as we said in section 5.1.1 and 5.1.2 it is important that time features are part of perceptual contents, since they are attributed to reality. Thanks to Simon Prosser to push me to specify this point.

between perceiving a whole object or a temporal part of it gets null, so there is no way to answer the intelligibility problem in this way[180].

Instead, if a specious present theory is true, especially my Tenseless Retentionalism, one may be tempted by the following moves: 1) claim that in the synchronic case of the eraser, the synchronic parthood relation is perceived because all the parts are given to the same act of perception. 2) claim that, given the specious present, several temporal parts of the same event are present together to the same act of perception. 3) Claim that because of this we should, by analogy, perceive the temporal parthood relation. 4) Conclude by contraposition that because we do not actually perceive the parthood relations, the Specious Present Theory is false.

My reply at this point is to say that in the case of the eraser, plausibly, you lose the sense of composition or complexity of the object if your visual field is damaged such that you have an information loss of anything in the left side of the eraser. If you perceived nothing other than a blur in the blue part of the eraser (perhaps covering also part of the red part), probably this sense of composition gets partially lost. Now, let us recall the remarks in section 3.1.2 about Di Lollo's findings. In some experimental conditions people are not able to figure out the missing dots from two matrixes presented in sequence. As I argued, I believe that every specious present window presents us with an "information peak" on one instant and a rapid loss of information[181] (see section 3.1.2). This helps explain why we do not have the same vividness of all the temporal phases and thus why we do not perceive the object *as being composite*. For the current purposes, this means that we do have an account for why the parthood relation is not perceived, without appealing to anything like "perceiving as enduring".

The third remark is about the source of the idea of the perception as endurance by Prosser, namely the treatise by Velleman (2006). Velleman suggests that our illusion of *ourselves* as enduring arises from the fact that at each time we think about ourselves

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[180] I am a bit unfair to Prosser (2016) here: by his light this makes sense. Our perceptual system is snapshot like also in order to present us with instantaneous phases of t-events, blurring the distinction between endurance and perdurance. But, my point remains: if this is the case, we have no way to understand how the flow of time is like in a B-theory, if it relies on a perdurance/endurance distinction.
[181] This is compatible with naive realism, since as Power (2018) rightly maintains it is necessary that the object (or phase) be part of the phenomenology to be naive realist, not that the *whole* object be part of it.

as existing entirely (not just via a temporal part). As Hoerl (2014) points out, this is not something related to perception.

The final remark can be applied to B-Theoretical Illusionism *tout court*: the intelligibility problem *cannot ever* be solved. This because B-theoretical illusionism is based on the assumption that there is a clear divide between how a B-theoretical/perdurantist metaphysics *really looks like,* and how our phenomenology delivers it. So, there is an A-theoretical element in our phenomenology with no echo in reality. The B-theoretical illusionist has the charge to account for this element, which *outstrips* the resources of the B-theory, by using only B-theoretical friendly notions. This for the rather obvious reason that B-theoretical resources are the only available in reality according to the illusionist. An analogous project to this one can be that of the subjectivist about colours, namely the philosopher denying colours are part of the reality, since, she claims, we project them onto things. However, a comparison between the position of the colour subjectivist and the B-theoretical illusionists discloses why Illusionism is in trouble.

Given the subjective character of phenomenal properties, the best way to make colours intelligible is to appeal to contrasts, namely to the comparison among phenomenal properties of the same kind. The subjectivist indeed can still make the case that *blueness* is that thing that makes our perceptual experiences of the sky, of the EU flag and of the lapis lazuli similar, and different from the sensory experiences of fire, of the USSR flag and of rubies. Indeed, these latter perceptual experiences have *redness* in common (and so on and so forth). The same strategy cannot be pursued by the B-theoretical illusionists since every sensory experience delivers the A-theoretical element. This makes the contrast impossible: there is no way to show how it is like to perceive, let us say, "A-wise" as opposed to "B-wise". It is not so different from the remarks that Prosser (2016) himself makes to A-theoretical Distributionism.

The strategy by B-theoretical illusionists to deal with the intelligibility problem indeed reflects this situation. They try to overcome the difficulty in an indirect way. Their attempt is to flash out how the B-theoretic metaphysics would *really look like* in order

to provide a contrast case for the A-theoretical element[182]. On the other hand, as far as Illusionism is concerned, the move comes to pick up certain kinds of B-theoretically acceptable changes and persistence (for example the moving object by Prosser or the disposition of pictures by Dainton) and state that, without the A-theoretical element, our phenomenology would deliver only those kinds of change and persistence.

But it is easy to see how every attempt to make this move is arbitrary: why the disposition of pictures should be better than an apple falling to make sense of how the B-theory *really looks* like? After all, all t-events that are accommodated in a B-theory and explained in their difference by appealing to the qualitative dissimilarity among the phases. And the difference in the phenomenology of t-events can be equally explained in terms of similarity and dissimilarity among the perceived phases. All the examples provided by a B-theorist can be accounted for in this way. And this for the rather obvious reason that, in the very first place, the B-theorist has to account for *any kind* of change and persistence in this way as part of her theory. And she does so exactly because, by her lights, *nothing* enjoys anything like A-properties. In other words, instead of providing an account of what-it-is-like to perceive "A-wise" in opposition to perceive "B-wise", Illusionists always keep up contrasting kinds of B-theoretical changes and persistence with other kinds of B-theoretical changes and persistence. And the difference boils down onto the differences among the kinds of change and persistence themselves, regardless of any further metaphysical consideration. In the end, this is why Torrengo opts for brutal A-theoretical-like element in our perception. Let us see his proposal in the next section.

5.5.3 The Phenomenal Modifier

The last perceptionist proposal is the Phenomenal Modifier View proposed by Giuliano Torrengo (2017). The basic idea can be summarised as follows: 1) in our mental states, including perceptions, there is a primitive non-representational element which makes us feel as if time flows (the Phenomenal Modifier). 2) We mistake this non-

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[182] Please notice, this is the first point of disanalogy between B-theoretical illusionism and Colour Subjectivism: the latter has no need to provide an account of how exactly reflectance properties really look like, the assumption that our subjective experience of colours is different is enough.

representational element, which is not *ipso facto* about a feature of our reality, to be a representational element. This involves the attribution to the flowing character of time to the reality and the insurgence of the relative belief. In other worlds, The Phenomenal Modifier view is tailor-made to solve the *origin problem*.

Obviously, the most natural question is what this phenomenal modifier consists in. Torrengo (2017: 179) is explicit: it is a *vehicle property*, which modifies our phenomenology without affecting the content of the mental state. In this sense the phenomenal modifier is a violator of representationalism. It contributes to the phenomenology, without having an impact on the mental state semantics. Thus, it has not to be confused with tenses (section 3.3.3) nor with other vehicle properties making a contribution to the fixation of the accuracy conditions (these would count as representational *tout court*). Given this non-representational nature, it seems that the phenomenal modifier is close to a raw feel, a *quale* in the style of Ned Block (2003). Qualia and raw feels are in general difficult to define. Block (2003) understands two kinds of qualia, "mental paint" and "mental oil". Mental paints are purely phenomenal properties which are contingently associated with a representational content. The paradigmatic example is "redness" which is a *phenomenal property standing* in relation with a property in the environment (namely certain reflectance properties). Mental oils are those phenomenal properties that are *manifestly* nonrepresentational. According to Block pain, after-images and phosphenes are examples. The difference between standard representational properties on the one hand, and mental paints and oils on the other, is that, according to Block (2003), the former does not manifest themselves as transparency violators, while both mental paints and oils do.

However, the Phenomenal Modifier can be none. It cannot be a mental paint in order not to collapse in into another perceptionist view. If the Phenomenal Modifier were something like mental paint, it would stand in relation with tense properties. So, it would be treated in the same way as redness, a property in relation to something out there. Thus, the phenomenal modifier would count either as an Illusionist View or as a A-distributionist View, depending on whether time really passes.

Thus, it has to be something closer to the mental oil. Torrengo (2017: 179) points in this direction when he draws the analogy between the phenomenal modifier and

properties like "vividness" or "blurriness" in *perception*[183]. He (2017: 179) explicitly quotes the discussion by Boghossian and Velleman (1989) about blurriness as providing other examples of "phenomenal modifiers". According to the two authors indeed, blurriness is a property which does not alter the semantic of the representational content (the idea is that a short-sighted person seeing an apple without glasses, still undergoes a veridical perception if an apple is there, but the phenomenology is different). Thus – the suggestion goes- they count as phenomenal modifiers in the sense of Torrengo. However, an obvious concern arises: usually such nonrepresentational properties (mental oils) are introduced in the debate exactly *because we believe, by default, that they are not representational*. *i.e.* they are standardly recognised as being part of the subjective experience without contributing to the content (and surely this is what Boghossian and Velleman 1989: 93 think about blurriness)[184]. Indeed, the debate on these properties puts on the strong representationalist like Tye (2002a) the burden to argue that *despite our beliefs,* vividness and blurriness are still a matter of representational content. This suggests that if the phenomenal modifier is analogue to blurriness and vividness, it should ground the *opposite beliefs* than those at the basis of the origin problem: introspection should reveal to us that the phenomenal modifier is a mind-dependent property, rather than a real property. Thus, we should expect that the beliefs at the base of the origin problem be B-theoretical in vein: we should recognise time's flow as being completely mind-dependent. All the opposite than the beliefs about the flow of the origin problem.

Torrengo (2017: 285) is aware of the danger, and indeed he comes with a story of why we *systematically misattribute* the influence of the Phenomenal Modifier to the reality. In the case of blurriness this may happen if we do not put attention to blurriness as such, but only on the content. In a framework like Boghossian and Velleman's this is surely not the norm: the majority of time we recognise blurriness to be mind-dependent and it is surely possible to direct our attention to it in order to disclose this mind-dependency. In the case of the phenomenal modifier, it seems that the reverse must be true: we should never be able to put attention to the modifier, in order not to take it

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[183] Indeed Block (1996) treats Blurriness as an example of mental oil.
[184] Introducing the topic with after images, Boghossian and Velleman (1989: 93) write: "*Consider such an experience in which an after image appear to you* as *an after image*".

as a mind-dependent property. To defend this claim, Torrengo (2017) suggests that *all mental states* (not only perceptions) exhibit the modifier, so everything in our mind present to us the flowing-like character of flow grounding our beliefs about the flow.

Two remarks follow. The first one is that ultimately the suggestion about the *systematic misattribution* breaks down the analogy with blurriness. If blurriness is a mental oil property (rather than a property of the content *a là* Tye), then the norm is that it is recognisable as a mind-dependent property, while for the phenomenal modifier the opposite is true. Thus, since the phenomenal modifier is a vehicle property which is not representational, nor a kind of mental paint, nor a kind of mental oil, it must be a *sui generis property* in the best case, *ad hoc* in the worst. One may try to restore the analogy by saying that it is possible to conceive a case in which a subject constantly sees vividly. This subject would be impaired in her judgments about the actual brightness of the content (Torrengo 2017: 186). However, restoring the analogy with blurriness or vividness brings the same concerns as before back to the table. Why, if these everlasting blurriness and vividness were mental oils, are they not perceived *as mind-dependent* as every other mental oil? The permanent character of these mind-dependent properties may impair our judgments about the *contents*, but they do not prevent *a priori* that they are recognised as mind-dependent. Thus, the challenge may be so summarised: if the phenomenal modifier is a kind of mental oil on a par of vividness and blurriness, why is it never recognised as mind-dependent? If it is not like a standard mental oil, because we can never attend to it, then why should not it be *ad hoc*?[185]

One may bite the bullet and go for saying that this is why time is *sui generis:* time flow is among the mental oil phenomenal properties, but it is different from all the other mental oils because it is systematically mistaken as being either a mental paint or a representational property, since we can never attend to it. The problem with this

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[185] A possible way out from the dilemma is to conceive another analogy with blurriness. Let us assume that blurriness is a mental oil, and we have a community of short-sighted subjects from the birth. Without ophthalmologists nobody finds out that they are short-sighted in respect to the norm and they all behave in the same way. Probably in a case like this people would not realise, not even introspectively, that they see blurrily. The same could be true for the phenomenal modifier.

The problem with this proposal is that seeing blurrily is the standard of this community, so on the one hand, they do not grasp their short sight to be blurry as contrasted to vividness of the other people. On the other hand, they do not even misattribute the blurriness to the environment, for they cannot grasp neither the thought that they see blurry, nor that they see vivid in this respect: it is their standard.

proposal is that it seems to make the phenomenal modifier unintelligible, since the inability to be recognised as a mental oil derives from its pervasivity (all mental states have it). But this gives us with no phenomenal contrast to understand how the feel of flow is like (and we have ruled out any analogy with standard representational properties, mental paints and mental oils). So, we are left with a kind of brute phenomenal property, which cannot be attended to and without means to understand how-it-is-like.

More to this latter point: in the footnote 29, Torrengo (2017: 188) takes the adverbialist account of pleasure by Aydede (2017) as similar view of his own. Aydede makes a distinction between "*sensations*" which are Block's mental paints (mind-dependent properties which do the representing), and the "pleasentness", which is a modification of the mental paint/sensation. Aydede maintains that our attention can go only to the sensation, a plausible claim in the context of the phenomenal modifier view: if we cannot attend to the transient element directly, then this could help explain why we do not perceive it as a part of the vehicle. However, Aydede also claims that the modifier can be discerned by making contrasts: the sensations can be *either* pleasant *or* unpleasant. And this is how we make the modifier intelligible without relying on the attention to them. This cannot be done in the case of the time-flow modifier both because everything is taken to occur in time and because *all* mental states must have it, in order not to ground the belief that time's flow is mind-dependent.

The two final remarks that can be done at this point are rather trivial. The phenomenal modifier (*qua* vehicle property) is transparency violating, at least in the strongest form. Maybe a notion like Gow's (2016) positive phenomenal transparency (section 4.1) may help here, but it is not the notion we adopted so far. This is no surprise since the debate between Representationalism and Anti-Representationalism is construed on how to understand the notion of transparency in the first place. The last remark is simply to ask for a plausible evolutionary history for the mechanism responsible for the influence of the phenomenal modifier. Since its only function is to give rise to the sense of flow, which has no biological utility, we should understand how it evolved as a by-product of something else[186].

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[186] Torrengo and Bordini are currently at work to provide evidence to the idea that the sense of flow has an impact over our actions [personal communication].

5.6 Durations and Flow

In this and in the next section we will assess the relations between the feel of the flow and the duration perception. However, an important distinction has to be made: duration perception comes at various timescales (Grondin 2010; Gallagher 2011; Lee 2017; Pöppel 1997). Long timescales, by definition implies that other processes than perception are in play in giving the sense of flow. This section is about short timescales, those commonly studied by empirical psychology of perception.

Indeed, the last perceptionist-like suggestion is probably the closest to the cognitive sciences: perceiving the flow is nothing over and above than perceiving durations of the stimuli. Indeed, time psychology is often concerned with prospective timing tasks, namely tasks in which participants are asked in advance to give explicit judgments about intervals (Grondin 2010)[187]. Tasks of this kind usually bring about interference with other tasks, involving the executive functions (for example memory-based tasks or tasks about mathematics) or the perceptive tracking of other perceptive features (for example stimulus intensity). It is documented that the interference effects are reduced by training and that the progressive difficulty of the non-timing task. All seem to point to the direction that timing task diverts attention away from the other tasks (Brawn 2017).

So stated, this cannot be what perceptionists need: there is nothing over and above the perception of t-events duration pointing to a phenomenology of time feature. Fortunately for my opponents, Phillips (2012) shows that empirical data themselves disconfirm this view. If attention to the flow is attention to its duration, it should count as attention to an objective feature in the stimulust. Thus, it should count as a perceptive tracking tasks rather than an executive task. So, we should aspect that, because of the competition of the limited cognitive resources, timing tasks should doubly interfere with perceptual tracking tasks, namely they should impair (if they are the secondary task) and be interfered by (if they are the first task) performances in other involving the tracking of other *features* of the stimulus. But this prediction is *disconfirmed*: empirical data

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[187] In retrospective tasks, participants are not informed about their timing task. This because the aim is to evaluate a performance based on recollection rather than perception.

shows that perceptive tasks impact over timing, but not *viceversa* (see Phillips 2012 for a review). Moreover, contrary to the initial assumption, double interference happens in the case of executive tasks instead.

Phillips (2012, 2013) accounts for duration perception in a relative way (see section 3.3.5), meaning that the objective duration has to be relativised to the amount of non-perceptual mental activities occurring in that interval. I am not interested at criticising again the proposal (some objections can be found in Lee 2017). The interesting point here of the Phillipsian claim is about what it means to pay attention to *time* in this perspective: in his view it means putting our attention not to external *stimuli*, but to an internal state of the system, namely on the amount of mental activities to which we relativise durations. However, it is evident that this is not what perceptionists need: without an explanation like the "phenomenal modifier view" (section 5.6.3), there is no reason why we should infer from the representation of the *amount* of non-perceptual mental activities that time flows. Having more mental states in an interval rather than a few says nothing about any transient character whatsoever (not even of the stream). At the most we should believe that mental activities vary in certain circumstances (for example in frightening situations, Eagleman 2008. See Section 3.3.5). Thus, an explanation of why this should be (or should be mistaken to be) the perceptual phenomenology of time's passing is missing here.

5.7 Cognitivism: on Explaining away our beliefs

It is time to come back to the starting point of our enquiry, namely the idea that we conceptualise time differently than space, especially because of a transient element which is not shared by space (Galton 2011). This transient element, the flowing character of time, is cashed out by the A-theorist in terms of the idea that there is only a metaphysical privileged present moment in time and that moment changes. The origin problem is to explain why, by default our theory of time is the A-theory, namely why the beliefs about transience and privilege are so widespread, if they are not grounded in perception (cf. Baron at al 2015, Torrengo 2017). Crudely, I do not think that they are so widespread. My position is cognitivist since I do not believe that there is any sense of flow or presentness in our perceptual phenomenology. Moreover, I am eliminativist on the beliefs underpinning the origin problem, since I think that our cognitive system does

not incline us in the slightest onto believing that time passes. Indeed, the beliefs about flow and, eventually, presentness are generated by the common (and probably western) narrative about time, rather than *viceversa*. As we will see, I believe Kristie Miller is right at pointing at language as the source of this narrative in the English-speaking world, but she is wrong in assuming that "we believe" that time flows, if the latter has to be understood as a universal claim.

Let me explain. As it is stated the origin problem assumes that our beliefs about time's flow and, eventually, presentness are widespread cross-culturally since they are originated by our cognitive system by *default*. In other words, the standard attitude of any human being about time should be thinking that time passes. This suggests that, whether or not they are grounded in perception, these beliefs must be generated *automatically* and *immediately* by our cognition (cf. Hoerl and McCormack 2018). This stable and robust notion of belief is necessary in the dialectic around the origin problem: these beliefs would not be a challenge to the cognitivist, if they were not similar to those automatically and immediately generated by the perceptual act. In this sense, we should aspect that these beliefs should be somehow recalcitrant to the narration about time. To make an analogy, one may hold that the Muller-Layer illusion automatically and immediately generates the belief that the two lines are not of the same length. This belief always goes in conflict with the belief that the two lines are of the same length, but we give our assent only to this latter belief. The analogy with the Müller-Layer illusion is what an illusionist perceptionist needs, but I disagree: I think that the case of the flow does not generate robust beliefs in the same way in which the Müller-Layer illusion does.

Firstly, it is an empirical issue whether or not the beliefs about transience (or privileged present) are ubiquitous cross-culturally. As K. Miller, Holcombe and Latham (2019) point out, no empirical study (so far) directly addresses the question of beliefs. The best we have is the evidence that every language expresses presentness via tenses or aspectual forms (Gell 1992). Assuming (as we should do) along with the psychologist Lera Boroditsky (2018) that our language shapes the way in which we conceptualise time, the best that we can get from our usages of tenses and aspects is that humans take time to be linearly ordered. Nothing follows regarding its transient, flowing like character. Thus, it seems not true to infer from the universal grammar (the only

universal element in our conceptualisation of time, cf. Gell 1992) that we infer and believe that time flows. As Deng (2019) rightly points out, much more is needed in order to assume that we universally think in an A-theoretic way by default.

At this purpose it is worth to assess the empirical literature appealed to by those claiming that our conceptualisation of time is radically different than that of space (it is quoted by K. Miller, Holcombe and Latham 2018, K. Miller 2019, Hoerl and McCormack 2018, and Galton 2011). It is the work by Lera Boroditsky herself and her colleagues (Boroditsky 2001; 2018; Boroditsky, Fuhrman, and McCormick 2011; Fuhrman and Boroditsky 2010). The curious point is that these studies have the *spatialisation of time* as a starting point, meaning that they take our ability to represent time via spatial terms for granted and they aim to understand how different languages involving different spatial representations for time make differences in the way we represent time. Thus, it seems that the default assumption is exactly the opposite of that underpinning the origin problem: time is universally conceptualised as being sufficiently *akin to* space, rather than radically different. Two clarifications are at issue. The first one is about the limits of the spatialization pointed out by Galton (2011). The second one is the difference in the way in which various languages shape our conceptualisation of time, which deserves some more attention.

As far as the limits of spatialization are concerned, Galton (2011) makes his bet on the transience character of time, the only property of time which is clearly not shared by space. However, the reason why we take time to be transient according to him is because: "[it is] *the phenomenology of experienced time that is of interest here, and it would be perverse to deny that transience is one of its essential features*" (Galton: 2011: 702). If this is the reason to assume that the beliefs about the flow is widespread and stabilised, it is untenable by our light[188]. It would be a *petitio principii*. Given that we are both denying that we have perceptual experiences of the features of time and that the beliefs about transience and privileged present are so widespread, this reason by Galton does not impress us. Similar remarks have to be advanced in respect to the anthropologist Alfred Gell (1992), who is sometimes quoted as giving support to the idea

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[188] Please notice that they are no problem in Galton's dialectic, which derives the limits to spatialisation from the phenomenology, without assuming that it is established that we believe that time is different than space.

that our conception of the time as flowing is universal (*e.g.* by Hoerl and McCormack 2018). Gell himself is ultimately inclined toward the B-theory and, on a par with Galton, assumes that its default denial relies on human perceptual ability.

The second point regards the *differences* found by Boroditsky (2011) among languages. These differences shape the difference in the conceptualisation of time, following the different spatial representations employed in speaking about time. Many of these studies point into a difference in the *directedness* of time. For example, Chinese-Mandarin native speakers are sensitive to a representation of events in time following a top-down axis with a direction which mirrors motion fall: past events are "up" while future events are "down". This does not happen for English native speakers, who tend to arrange time horizontally following a "left-to-right" direction (Boroditsky, Fuharman, McCormick 2010). Interestingly for our purposes Hebrew native speakers arrange time "right-to-left", following the direction of their writings (opposite to those of English) (Fuhrman, Boroditsky 2010). But again, all these differences are not sufficient to give time a transient character: as even Galton (2011) concedes, the "stationary" space has some forms of linear asymmetries too! For example, given by the Earth gravitational field, we cannot invert "up with down". Moreover, there is a direction of our spatial field (for which there is an asymmetry between "back and front"). Thus, our conceptualisation of directedness in time should not give rise to the belief that time passes by default, since the directedness of space does not give rise to the same belief[189].

The considerations so far should point to the idea that, at least, it is not straightforward to assume that our cognitive system is necessarily responsible for the robust beliefs of the origin problem, as if they were a universal element of the mankind. The last thing to explain is why locally, i.e. in analytic philosophy, it is customary to take the belief of time's flow to be the common sense. I take advantage from the suggestion by Boroditsky (2018) according to which English shapes the way its native users think about time. English is what K. Miller (2019) and K. Miller, Holcombe and Latham (2018) call a *strong passage friendly language*, i.e. it is part of those languages that, in addition

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[189] A similar point is in Torrengo (2018b).

to having tenses, they also admit time moving and/or ego moving metaphors. Setting aside these latter, of which I am not convinced[190], the idea is that English, contrary to other languages, *does allow* for a representation of time with a flowing-like character. However, I believe that this representation of time as flowing is not the product of our cognitive system, but rather the effective of our common narrative about time. In other words, it is not because we believe that time passes, that we express that time passes. The reverse is true: it is because we express that time passes that we believe that time passes. It is empirically documented that people start believing false statements (even contradicting their own knowledge), if they are continuously exposed to them (Fazio et al. 2015) and the repetition of a statement is a powerful belief inception (Hasher, Goldstein, and Toppino 1977). Therefore, the idea is that there is no reason to infer that our cognitive or perceptual system generate any robust belief about the passing of time. Indeed, plausibly the languages into which English was originally in contact to (for example Latin, but a more serious historical-linguistic analysis should be needed here) allowed for expressions like *Tempus fugit,* which might have been imported into English. These expressions (now as then) were false statements that came to be believed by the speakers of both English and its ancestor languages. Since the belief that time passes is the upshot of the narrative, my bet is that changing the narrative would bring into account the change in the beliefs. In other words, I believe these beliefs are not as robust as required by the origin problem and their status will be soon revised. Take the example of the belief that the sun rises. Our knowledge of astronomy prevents us to take it literally, even though it has been taken seriously for centuries. In the same way, I believe that once that Einstenian physics and contemporary philosophy become as popular as Newtonian physics, people stop taking the belief that time passes seriously. And the origin problem will disappear by itself.

Given these remarks, a sort of "evolutionary" story is needed in order to understand why some speakers started expressing the statement that time passes in

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[190] Boroditsky (2001, 2018) herself seems to point into the direction that ego-moving metaphors treat time as "stationary" since it is the subject that "moves" in time, in an analogous manner than space. I think this suggestion is correct under the further assumption that the present is treated like an indexical. Moreover, since the fact that a subject moves across space does not bring about the belief that space moves, the idea that a subject moves throughout time should not equally give rise to the belief about transience.

the first place. The belief of the rising sun is the perfect analogy for the point I want to make here. Nowadays we do not give the assent to the belief that sun rises, but it is still useful for practical purposes (for example, to regulate our activities accordingly). This because our taking the sun to rise is a *good approximation* of what really goes on, namely the rotation of the Earth around the sun. This good approximation is not casual: when the belief was taken seriously, it was the time in which Newtonian physics had not been available yet. The approximation is the best they got from their observations, and it was good enough for their practical purposes. The same may be true in the case of the passing of time: what the belief of the flow may disclose is a series of quite abstract concepts that arguably were not available when the expression "time passes" became established. Callender (2017) offers a review of these: time is unidimensional, it is directional (from past to future), we all share a "common now" available to anyone (Callender 2008; 2017), ma not a common "here" (even though there would be one, if space had directionality and less dimensions). Finally, and this is the only true point in which space and time differ in an interesting sense (so far time seems just an impoverished version of space), causation is asymmetric to time, but not to space. Causal asymmetry also explains the sense of "passivity" that we have in respect to time: our actions a part of the causal network (Deng 2013a). It also explains why we have a certain epistemic access to the past through memory, but not to the future (Mellor 1998). In brief, the expression "time passes" stands for all these features. My bet is that it was easier to model these aspects of time on the based on an everyday phenomenon like motion, instead of abstract metaphysical reasoning. At the end of the day, Hoerl (2014) was right at claiming that the "dynamic" aspect of change (the qualitative dissimilarity among phases) was attributed to time itself. However, I do not think it was a cognitive error generated by our cognitive system, I simply believe that it was the best model of time we used to have back then. Please notice in this respect that whilst the transience/flow is a feature of time only, causation involves both time and space (reducing again the dissimilarities between the two).

Finally, there is a disanalogy between the belief that the sun rises and the belief that time passes. The former was undoubtably perception-based: we see that the sun rises, arguably we believe it (and the belief is useful for practical purposes) but we do not give our final assent. This seems to suggest that our beliefs about time should

equally have a perceptual component. However, as the discussion in section 5.4 may have discloses, there is no way to perceive the flow. The only thing that perception shows us is that at different times we have different specious present windows, or different instantaneous contents. Then the *contrast* among the windows shows that these are disposed in a linear, causal asymmetric fashion and this is captured by the statement that time passes. Thus, my cognitivist project is complete, nothing like presentness or flow is part of our perceptual acts.

APPENDIX5: The arrow and the dynamo

In the IV century *b.c.* the great philosopher Zeno of Elea formulated a series of paradoxes targeting what we may call the "rationality" of motion. Whilst Zeno's goals are subject to controversy, the standard interpretation is Plato's, who takes the paradoxes to support the conclusion of Zeno's master, Parmenides, according to which the sensory experience is misleading: everything is unitary and immutable (Dowden 2019). One of the four famous paradoxes against motion is known as "the paradox of the arrow". It goes as follows: an arrow travels from point A to point B. And it takes a certain amount of time *dt*. At each instant *t* of *dt*, the arrow occupies a certain region of space. However, since regions of space do not move, then *in* each instant the arrow does not move. But since *dt* is made up by instants in which the arrow does not move, the motion from A to B is a sequence composed by the arrow in positions of rest. And this is absurd. As we know, the standard reply from a metaphysical point of view is to deny that in each instant the arrow is not moving: this because at each instant the arrow acquires its status of motion in relation of what happens in the *nearby instants*. That is to say, motion and rest are processes requiring intervals and if a body is moving or resting *at t* is dependent on the broader interval encompassing *t*. This is called the *at-at* change. And the point of the *at-at* change is that it best suits Eternalism: the arrow is tenslessly in movement at *t*, given that it is in a different location *at t'*.

The converse of this is that it is nonsensical to think about the motion or rest of an object in abstraction from a broader interval. This is also supported by the fact that if the velocity of the arrow has to be calculated as the ratio between the covered distance and the amount of time employed, saying along with Zeno that in a zero-

duration instant the arrow covers no distance means having a meaningless ratio (namely 0m\0s).

This has some consequences also from a phenomenological point of view. It means that instantaneous contents deliver us neither a phenomenology of something moving, nor a phenomenology of something resting, when taken in abstraction from the whole interval they are part of. So, if an instantaneous arrow comes to being, our perception of it will deliver *neither dynamic nor static phenomenology* (*pace* Kelly 2005 and Dainton 2011b). After all the Naïve View is based on this concept (but I do not think it is sufficient without a good story for diachronic unity). However, the point I would like to make here is that it is wrong to assume that our sensory experience is misleading since it delivers "something more" than the *at-at* change of the arrow. The arrow has never been static in the very first place: nothing more has to be added in order to perceive it in motion.

Conclusion and future research

This dissertation has provided only a brief sketch on what may be called our "experience of time". Indeed, our focus has been only perception and the way in which it delivers temporal phenomenology. Given that my Tenseless Retentionalism is able to answer to all the problems commonly advanced to it without renouncing to temporal transparency, it should be preferred over the more problematic competitors. One distinctive point of my theory is that the strong notion of transparency in play makes it able to accommodate the phenomenal character of our perceptual experience without necessarily being committed to representations. This opens up the first possibility for future lines of research: it is possible to assess the compatibility of my theory with the theories of cognition falling under the term of "Enactivism". The anti-representational attitude of people like Hutto and Myin (2013) can be combined with my Tenseless Retentionalism as a competitor of the softer, more representation-friendly, Enactive Retentionalism (Gallagher and Zahavi 2014). This latter, in being the modern re-proposal of the Husserlian Theory, has still to rely on some notion of representational content, which can be dismissed in my theory.

Another possible line of research can be related to Memory and its relation to the perception of time. It may be possible (as sometimes Wittman 201 seems to suggest) that Memory works under some Extensionalist, rather than Retentionalist logics. This can help understanding why at higher timescales it seems natural to think about our perception of temporal properties in Extensionalist terms (cf. Montemayor 2017, 2019). If this is true, then we should relax the expectation that memory is somehow perception-like. For example, as Kourken Michaelian (2016) suggests, imagination is the key notion to understand memory.

Finally, another conception of how time impacts our life in every form, from memory to expectation, from decision-making to time management, not to mention personal identity and selfhood, can take advantage from many ideas discussed in the last chapter. Taking from granted that we do not perceive time as flowing, a more refined analysis on how directionality impacts on our life can be pursued. Moreover, the issue of the feeling of a *ratio* of time and what it really means to "perceive" time as slowing down or getting fast is still open. Just a few Psychologists addressed the issue of

what our judgments about time *ratio* consists in and how it impacts on our memory (Jones 2019). An analysis of why we are prone to make such judgments, which affects the way in which we perceive durations, can be of interest for future research.

I conclude by wishing to myself the opportunity to write such a book about the overall impact of time on our life and I thank the reader to have come until the last page.

Acknowledgments

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