The Disclosing Window

By

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Abstract

In this dissertation I develop a new theory of time called the *Disclosing Window Theory*. In Chapter 1, I focus on Temporalism, the view that there are temporary truths. Temporalism is the building block of a metaphysical stance which traditionally goes under the name of A-theory. After disentangling different instances of Temporalism, I focus on one specific version of it – Non-Qualitative Temporalism – according to which the only temporary truths are truths involving individuals. In Chapter 2, I develop my favorite instance of Non-Qualitative Temporalism – the Disclosing Window Theory. The Disclosing Window, I argue, is defensible and in a position to respond to some *prima facie* objections having to do, respectively, with the temporal status of necessary truths and with epistemology. In Chapter 3, I illustrate and discuss an objection against Temporalism based on spacetime physics, both in a Neo-Newtonian and in a Relativistic Setting. In Chapter 4, I argue that the Disclosing Window is in a position to elude what I call the Objection from Spacetime. In particular, I show that the Disclosing Window, in contrast to most of its competing temporalist A-theories, (i) does not entail that a given portion of spatiotemporal structure (e.g. a hypersurface) is metaphysically privileged and (ii) does not need to presuppose that there is a privileged foliation of spacetime into hypersurfaces. In Chapter 5, I develop a conditional argument in favor of Temporalism. I argue that the B-theory of time, insofar as it is coupled with the perdurantist theory of persistence, entails untenable results concerning consciousness which can otherwise be avoided in a temporalist setting. My conclusion is that the Disclosing Window deserves a respectable place among the theories currently available to temporalists.

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I have a huge debt with Giuliano Torrengo. Giuliano assisted me throughout my whole doctoral studies and prevented my arguments from running in a vast number of imprecisions and mistakes. And he did this for free. Furthermore, he welcomed me in the Centre for the Philosophy of Time in Milan and in the CHRONOS Research Project in Barcelona. I hope that our collaboration allowed us to understand where exactly our disagreements in the philosophy of time are to be situated.

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Kati Farkas, Mike Griffin, Daniel Kodaj, Asya Passinsky, Howard Robinson, and Matthew Simpson. I am glad that I could get to know my friends Denis and Liam. And I am happy I could meet Agnes, Bálint, Darren, Davide, Emily, Yaren, Frank, Feng, Henrique, Hongkai, Laci, Pau, Pelin, Sami, Tina, and many others whose path overlapped with mine in various occasions and circumstances, at the PhD Lab and elsewhere.

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I am grateful to my parents, Silvana and Manuel, for being with me. Everything I do is due to my mother and devoted to her, including this dissertation.

Contents

Chapter 1   The Temporalist Landscape

‘Solo ti muovi in questo spaziotempo, e…’

(Vasco Rossi, *Vivere o Niente*, 2011)

In this chapter, after introducing the main temporalist A-theories on the market, I focus on Non-Qualitative Temporalism. First, I shall sketch the core insights of this version of Temporalism. Then I shall show that Non-Qualitative Temporalism interestingly relates with the view that the same token properties can be shared between a primary bearer of those properties and a parasite entity which instantiates them derivatively. Relatedly, I shall show that a distinctive version of Temporalism, which I will label Sharing Temporalism, can be developed. Then I move on to considering an instance of Sharing Temporalism which I ultimately don't endorse but which shall serve as a stepping stone for the ultimate view that I will develop and argue for in the subsequent chapters.

1.1   Temporalism and Atemporalism

Informally, *Temporalism* is intended to grasp the fact that some things in reality are merely temporary – that sometimes they are the case and sometimes they are not the case.

> **Temporalism:** For some p, sometimes p and sometimes not p.

Temporalism can be understood as a thesis involving quantification over propositions. In particular, as the view that some propositions are temporary in that they are sometimes true and sometimes not true.

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Propositional Temporalism: For some proposition p, sometimes p is true and sometimes p is not true.

In this setting, for example, a proposition like the proposition that John is sitting is an instance of temporary proposition. Notably, *Propositional Temporalism* is supported by a battery of arguments coming from the philosophy of language in the first place.[1]

However, as some have argued,[2] Temporalism doesn't have to be understood as a thesis necessarily involving quantification over propositions. Temporalism can be understood as involving higher-order quantification, that is, quantification into predicate or sentence position – Deasy (2022) calls this view *Sentential Temporalism*. Further, it can be maintained that higher-order quantification is not to be reduced to ordinary languages. This move allows one to rule out that, at the first order, Temporalism implicitly quantifies over items like propositions. Of course, this move requires the acceptance of irreducible higher-order quantification, which, while nowadays enjoying growing popularity and consideration, still faces some relevant objections, most notably the charge of being utterly mysterious.[3] But what is most relevant is that this kind of strategy shows that there is at least *some* option for developing Temporalism without slipping into quantification over propositions – which shall surely be reassuring for those that are resistant to accepting quantification over propositions at all.

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[1] See Brogaard (2012).
[2] See, for example, Prior (1973) and Deasy (2022).
[3] See, inter alia, Dorr (2016) and Bacon (2024) for more on higher-order quantification. See also Deasy (2025). for a useful and brief introduction to the higher-order turn in contemporary metaphysics.

I myself don't have any resistance in accepting (the bit of) higher order quantification involved by Sentential Temporalism.[4] However, in what follows I shall set this view mostly aside and resort instead to Propositional Temporalism. This is due to the fact that Propositional Temporalism allows a much smoother exposition of the topics I shall explore in the following – Prior (1971) and Deasy (2023) adopt the same policy. Accordingly, I shall formulate the notions introduced below in propositional terms.

Temporalism is to be contrasted with *Atemporalism*[5] (which goes sometimes also under the name of Eternalism).[6]

Atemporalism: For any proposition p, if p is true then is always true.

The upshot of Atemporalism is that there are no temporary propositions: each and every proposition has its own truth value eternally.

The point of Atemporalism, of course, is not that some obviously temporary propositions like the proposition that John is sitting always have the very same truth value over time. Rather, the point is that items such as the proposition that John is sitting fail to qualify as propositions in a strict sense. The atemporalist insight is that propositions correctly understood involve *temporal parameters*. In this setting a proposition such as the proposition that *John is sitting at t* is an appropriate bearer of truth values. And this latter proposition is obviously a good candidate for

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[4] So does Bacon (2018), who develops his own temporalist view by appealing to Sentential Temporalism.
[5] Frege (1952) is among the first proponents of Atemporalism. The view, as I shall note below, is endorsed by B-theorists of time. Atemporalism is also supported by some arguments in the philosophy of language, see for example Richard (1981).
[6] I prefer Atemporalism over Eternalism as a label for the view since the latter has also been widely employed as a label for a position in temporal ontology which is usually contrasted with Presentism.

possessing an eternal truth value, for it is indeed always the case (say) that, *at t*, John is sitting.[7] This is in fact not more surprising than the proposition stating that *on 20/01/2025, at 10: 54 AM*, I am drafting a chapter of my thesis is always true. Of course, temporalists disagree here and claim that propositions like the proposition that John is sitting is indeed a well-formed proposition capable of possessing a (temporary) truth value. In the resulting picture, Temporalism and Atemporalism, before disagreeing on how the truth value of propositions behaves across time, disagree on what counts as a well-formed proposition in the first place.

1.2   Other Notions

There is a number of additional notions in the proximity of Temporalism and Atemporalism which we need to introduce in order to set out our subsequent discussion of temporal metaphysics. In this section, I go through them with the merely illustrative purpose of elucidating their core insights. In doing so, I shall make no attempt to address the complications which would otherwise arise in a much closer investigation of the notions at stake and the issues revolving around them.

Strong and *Moderate* Temporalism disagree on whether Temporalism applies to propositions about the fundamental layer of reality.

Strong Temporalism: Some propositions about the fundamental layer of reality are temporarily true.

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[7] Sider (2011: ch. 11) develops a 'metaphysics of saturation' which explores this kind of strategy in greater detail.

Moderate Temporalism: Only some propositions about a derivative layer of reality are temporary true.

While Strong Temporalism maintains that both propositions about the fundamental and the derivative layer have their truth values temporarily, Moderate Temporalism maintains that only some derivative propositions are temporary. For instance, while a strong temporalist view can agree with a moderate temporalist view that a proposition which with any plausibility is not about the fundamental layer of reality, like the proposition that John is sitting, is temporarily true, they will disagree on whether a proposition which with some plausibility is about the fundamental layer of reality, like the proposition that there is such and such distribution of value-fields at such and such spatiotemporal points, has its truth value eternally. Instances of strong temporalism are familiar. Moderate temporalism, by contrast, has been explored only recently.[8]

Qualitative Temporalism and *Qualitative Atemporalism* disagree on whether the qualitative furniture of reality is Atemporal or not.

Qualitative Temporalism: For some qualitative proposition p, sometimes p is true and sometimes p is not true.

Qualitative Atemporalism: For any qualitative proposition p, if p is true then p is always true.

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[8] Bacon (2018) explicitly develops a moderate temporalist view. Sider (2011: ch. 11) considers a view very much kindred to moderate temporalism and so does Sanford-Russell (2016). Bacon's view is introduced below.

Relatedly, *Non-Qualitative Temporalism* and *Non-Qualitative Atemporalism* disagree on the non-qualitative furniture of reality.

> **Non-Qualitative Temporalism:** For some non-qualitative proposition p, sometimes p is true and sometimes p is not true.

> **Non-Qualitative Atemporalism:** For any non-qualitative proposition p, if p is true then p is always true.

The notion of *qualitativeness* is fraught and yet to be fully explored. Yet the core insight underlying talk of qualitativeness is that a distinction can be made between those sides of reality which do involve individuals, such as the property of *being identical to John* and those sides of reality which don't involve individuals, such as the property of *being a human being*. There are no entirely uncontroversial and widely accepted definitions of this notion although ways of analysing it have been provided, e.g. in terms of aboutness.[9]

One attractive way of handling qualitativeness – adopted, for example, by Bacon (2019) – is assuming that qualitativeness is a property of propositions, whereby some propositions are qualitative, and some propositions are not qualitative. In this setting, a proposition like the proposition that someone is sitting is not about any specific individual. As such this proposition is classified as *qualitative*. By contrast the proposition that John is sitting is about a specific individual. As such it is classified as *non-qualitative* (or *haecceitistic*). Qualitative Temporalism and Atemporalism disagree on whether qualitative propositions are temporary.

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[9] See Hawthorne, Dorr and Yli-Vakkuri (2021, ch. 14 and 15) and Bacon (2019) for more detailed discussions of qualitativeness and the options for regimenting the concept in a more formal way. In what follows, I mainly follow Bacon's distinction between qualitative and non-qualitative propositions. My hope is that the use of qualitativeness I shall make in this work will be compatible with different accounts of the concept.

Non-Qualitative Temporalism and Atemporalism disagree on whether non-qualitative propositions are temporary. As we shall see in due course, the distinction between Qualitative and Non-Qualitative Temporalism is a salient one, for while the former extends Temporalism over those parts of reality which don't involve individuals, the latter does not.[10]

Permanentism and Transientism disagree on the temporal nature of existence.[11][12]

> **Permanentism:** Always, everything is always something.

> **Transientism:** Sometimes something is nothing.

While Permanentism holds that nothing never goes out of existence, Transientism allows to maintain that things start and cease to exist. Notably, Permanentism is neutral on the underlying nature of permanent entities. As argued in Williamson (2013), those entities, while always existing can be subject to even radical changes in their nature, e.g. transitioning from being concrete to being non-concrete.

Temporal Parity and Temporal Disparity disagree on whether the present time is in some sense metaphysically distinguished from the past and the future times.

> **Temporal Parity:** The present time is metaphysically more special than the others.

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[10] This is intended to stay neutral on the related question of whether individuals are part of the fundamental forniture of reality or not.

[11] Williamson (2013) articulates these views and their modal counterparts.

[12] Notably, Permanentism and Transientism are the counterparts of two analogous theses in the philosophy of modality: Necessitism and Possibilism. Williamson (2002) and (2013) develops and explores these views at length.

Temporal Disparity: All times are metaphysically on a par.

While Temporal Parity implies that no time among the others is metaphysically distinguished, Temporal Disparity holds the opposite and maintains that the present time is in some sense special.[13] The specific interpretation of Temporal Parity and Temporal Disparity varies on what tackle one has on the nature of times.

Physical Times: Times are identical to some physical entities, e.g. spatiotemporal hypersurfaces.

Non-Physical Times: Times are identical to some non-physical entities.

While Physical Times identifies times with physical entities such as spatiotemporal hypersurfaces, Non-Physical Times has it that times are identical to some sort of theoretical entities. One relatively popular way to develop Non-Physical Times is by holding that times in fact are maximal and consistent propositions which describe instantaneous snapshots of reality – see, inter alia, Markosian (2004) and Deasy & Banfi (2019). But there are also views which develop Non-Physical Times by appealing to certain mathematical entities rather than to propositions, e.g. Dorr's and Bacon's views to be discussed below. Non-Physical Times proves useful to those that want to recover talk of past and future times without dropping the view that only present things exist, such as Presentists.[14] But, as we will see soon in much more detail, Non-Physical Times can be useful also with respect to other theoretical goals.

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[13] There is of course a question about what metaphysical specialness is after all. As a matter of fact, different theories qualify metaphysical specialness in different ways, to the effect that what metaphysical specialness is turns on what theory is considered. This is not to say that metaphysical specialness cannot be addressed with some hope of generality. A discussion of it is postponed till Chapter 4.

[14] As discussed in Deasy & Banfi (2022), though, endorsing Non-Physical Times rases some puzzles on its own for Presentists.

The specific interpretation of Temporal Parity and Disparity varies on what of Physical and Non-Physical Times is endorsed.

Physical Parity: All physical times are metaphysically on a par.

Physical Disparity: A physical time is metaphysically distinguished from the others.

Non-Physical Parity: All non-physical times are metaphysically on a par.

Non-Physical Disparity: A non-physical time is metaphysically distinguished from the others.

Finally, a few remarks on how Temporalism and Temporal Parity relate. As we shall see soon, standard instances of Temporalism reject Temporal Parity for endorsing Temporal Disparity. However, there is a question as to whether there can be instances of Temporalism which do in fact fully subscribe to Temporal Parity. I shall not tackle this question at length here. However, I shall presuppose that Temporalism does in fact entail Temporal Disparity. This has some support in the literature about Temporalism and Atemporalism. In particular, Cian Dorr (*Counterparts*, ch. 1), persuasively showed that, while Atemporalism entails that all times are accurate Temporalism entails that only one time is accurate.

Say that an instant is 'accurate' iff the propositions that are true at it are all and only the true propositions. If propositional [Atemporalism] is true, all instants are accurate, since the truth of a proposition does not vary as between different instants. By contrast, if

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propositional temporalism is true, most instants are inaccurate. The sun is either shining or not; if it is, the proposition that the sun is shining is true, and all the instants at which it is false are inaccurate; if it is not, the proposition that the sun is not shining is true, and all the instants at which it is false are inaccurate. Among the instants that are not inaccurate as regards whether the sun is shining, many are inaccurate as regards whether I am sitting down; clearly at most a few instants are accurate in every respect. In fact there is a strong case to be made that the present instant is the unique instant that is accurate in every respect.

More particularly, in this setting *Accuracy* is to be understood as follows:

Accuracy: A time *t* is accurate if and only if, for any proposition p, p is true if and only if at *t*, p is true.

As a result, Temporalism seems essentially entangled with the view that a given time among the others is metaphysically distinguished, where the 'minimal' temporalist distinction consists in the property of being accurate. In such a way, the space for combining Temporalism and Temporal Parity looks quite narrow.

1.3   A- and B-Theories

Traditional disputes about the nature of time are usually phrased by appealing to a distinction between A-and B-theories.[15] Where are A- and B-theories in this setting? As a matter of fact,

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[15] The names of the theories are due to Gale (1968). The expressions 'A-series' and 'B-series' track back to 'McTaggart (1905). Thanks to Giuliano Torrengo here.

the distinction between A- and B-theories can be framed in terms of the notions introduced above.

The *B-theory* of time combines Atemporalism, Temporal Parity and Permanentism. These three views are naturally tied together. Given what we said above, Temporal Parity rules out Temporalism. And Atemporalism in turns rules out Transientism, for, if Transientism were true, then there would be temporary truths about which entities go in and out of existence.[16] In the resulting picture, reality can be viewed as a block which (i) has not room for change understood as change in the truth value of propositions,[17] (ii) there is no metaphysically distinguished present time, and (iii) has an ontological inventory which is fixed and not subject to any variation.

The A-theory of time, by contrast, endorses Temporalism and Temporal Disparity. As noted above, Temporalism entails Temporal Disparity. And Temporal Disparity is naturally coupled with Temporalism.[18] This combination of views allows to maintain that propositions about the present time are only temporary true. So, for example, it is only temporarily true that (an instant in) 2025 is the present time. The core intuition of the A-theoretic approach is that (i) there is change in the truth value of some propositions, and (ii) there is a metaphysically distinguished present time which keeps changing.

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[16] Furthermore, as Bacon (2018: 668) notes, Permanentism is trivially true in a context where Propositional Eternalism is assumed, for within such context tense operators turn out to be redundant (in the sense that expressions like 'Sometimes P' and 'P' are equivalent), 'Note that eternalism entails permanentism since, given that tense operators are redundant, it amounts to the vacuous claim that everything is something'.

[17] B-theorists of course, believe that the right way to think of change is not in terms of Temporalism, but rather in terms of some other understanding which is compatible with their own view.

[18] Temporal Disparity does not entail Temporalism. In principle, there can be views that endorse Temporal Disparity without Temporalism. But these views are arguably not in the spirit of the standard A-theoretic approach as they provide a picture of reality where there is no change in which time is the metaphysically distinguished present time – the present is 'frozen'.

How the B-theory relates to Permanentism is clear. How does the A-theory relate to Permanentism? So far, I wrote as if there were only one A-theory. But this is not strictly correct for there are many A-theories. That is to say, there are many different theories which endorse the combination of Temporalism and Temporal Disparity. Something about which these theories disagree is Permanentism. Some A-theories hold that there is change in which things exist. And some theories maintain that there is no change in what exists. Most notably, *Presentism*[19] maintains that only present things exist, and the *Growing Block Theory*[20] maintains that only past and present – but not future – things exist. These views reject Permanentism and embrace Transientism. And, some other A-theories reject that there is change in what exists. For example, the *Moving Spotlight Theory* holds that past, present and future things all exist but the present time is metaphysically distinguished, thereby endorsing Permanentism.

	Propositional Temporalism	Propositional Atemporalism	Temporal Disparity	Temporal Parity	Permanentism
B-Theory	No	Yes	No	Yes	Yes
A-Theory	Yes	No	Yes	No	?

The disagreement between different A-theories does not reduce to Permanentism and Transientism. To mention another instance of disagreement, A-theories disagree also about Physical and Non-Physical Times. For example, while friends of the Growing Block view standardly hold that times are identical to spatiotemporal hypersurfaces, some friends of Presentism hold that times are identical to some non-physical items such as maximal propositions describing reality.

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[19] See Zimmerman (2011) for a systematic defence of presentism.
[20] See Correria & Rosenkranz (2019) for a defence of the Growing Block.

Furthermore, there are instances of Temporalism which are not easily classified, such as Fine's *Fragmentalism* (2005). In a nutshell, according to Fragmentalism reality comes in many fragments which are internally consistent but mutually incoherent. One way to grasp this is in terms of propositions: each fragment comes with a set of temporary propositions (including propositions about which portion of spacetime is the present) which are incompatible with the temporary propositions associated with the other fragments. Other (more popular) ways are in terms of facts, though there is no unique version of Fragmentalism and many sophisticated accounts have been elaborated starting from Fine's insight.[21]

I shall not delve more into a discussion of where and how A-theories disagree here. I think this issue will be to some extent clarified as we move forward in our discussion of concrete instances of A-theories. This is what I shall do in the next section, where I move on considering my preferred kind of A-theories – A-theories combing Temporalism and Permanentism.

Before doing this, there is a final question to be addressed. A- and B-theories are often introduced and defined by appealing to tensed facts, whereby the crucial distinction between A-and B-theories is that while A-theories have room for tensed facts, B-theories don't. Some may wonder why I resorted to a distinction between Temporalism and Eternalism to define these theories.[22] The reasons for this are multiple.

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[21] See, e.g. Iaquinto & Torrengo (2022)

[22] A related issue is about my choice to endorse a distinction between Transientism and Permanentism as opposed to a more familiar distinction between Presentism and Eternalism (the view that past, present and future things exist). Again, the reasons are that the framework where my sympathies go is built around Transientism and Permanentism as opposed to Presentism and Eternalism. I shall offer no arguments for this choice as I believe I have nothing to add to what Deasy (2019) already said in response to Cameron (2016).

First of all, as a matter of sociological consideration, a framework appealing to the distinction between Temporalism and Atemporalism rather than to tensed facts has been enjoying growing popularity in recent years.[23] Most notably in Dorr's (MS), Bacon's (2018), and Deasy's work. This provides the choice of this peculiar framework of some legitimacy and independent interest. The present work aims at making a modest contribution to this trend – and shall in fact confront at length with the theories that have been developed by these authors over the years.

Second of all, there are some advantages brought about by a framework resorting to Temporalism and Atemporalism which would not be obviously achieved if a framework appealing to tensed facts were endorsed instead. The first advantage is expository. The theory I aim at developing and defending is more easily introduced by appealing to Temporalism and Atemporalism. A reason for this being that such a theory appeals heavily to a difference between the qualitative and non-qualitative sides of reality, thereby making the distinction between Qualitative and Non-Qualitative Temporalism and Atemporalism particularly useful. A second reason for this being that such a theory is deeply kindred to Dorr's and Bacon's theories, which as noted above are phrased by appealing to Temporalism and Atemporalism. The second advantage is about some independent virtues of the framework at stake. I shall mention one. It has long been assumed that A-Theories involve irreducible tense operators, in such a way that operators rather than being reduced and further analysed should be considered fundamental.[24] Josh Parsons in an insightful paper showed that the possibility of an A-theory which provides a certain reductive analysis of tense operators is indeed on the table.[25] Dorr (*Counterparts*) Sullivan (2012) and Deasy (2015, 2022) continued this approach and developed

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[23] This parallels the growing popularity of Williamson's (2002, 2013) framework in the philosophy of modality.
[24] See, e.g. Sider (2001).
[25] Parsons' account appeals to a counterfactual analysis which reduces tense operators by way of some counterfactuals built within an A-theoretic world.

other A-theories that do in fact dispense from accepting irreducible tense operators.[26] Appealing to Temporalism and Atemporalism allows in fact to stay neutral on this matter and leaves open whether A-theories do reduce operators or not. Quite clearly, the same does not go for distinctions made in terms of tensed facts, for these distinctions *prima facie* appeal to something that some A-theories in principle reject.

1.4   Permanentist Temporalism

Some A-theories combine Temporalism and Permanentism. Along with the view that there is a metaphysically distinguished present time, Permanentist Temporalism holds (i) that the ontological furniture of reality is fixed, and (ii) that there is change in the truth value of some propositions. An implication of this is that, in a permanentist temporalist setting, there is change, but change is not about what exists. What is the object of change is something that different instances of Temporalist Permanentism disagree about. This in turn relates with how friends of Permanentist Temporalism relate to other theses introduced in the previous sections., e.g. with Qualitative Temporalism.

A first instance of Permanentist Temporalism is the *Moving Spotlight Theory* – see, inter alia, Deasy (2015, 2022) and Skow (2015). According to a standard version of the Moving Spotlight,[27] reality is a four-dimensional manifold which comprises past, present and future times. The present time – which is identified with a spatiotemporal hypersurface – is metaphysically distinguished from the others in that it instantiates the property of *presentness*,

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[26] Dorr's account appeals to some given mathematical entities ('counterpairings') and Deasy's account refines and further develops Parsons' original counterfactual analysis.
[27] There are versions of the Moving Spotlight which go astray from this picture, e.g. Cameron's (2015).

which in a moving spotlighter setting is described as a temporary fundamental property. In this setting, change is about the instantiation of presentness.

Since the Moving Spotlight identifies times with spatiotemporal hypersurfaces, it endorses Physical Times and Physical Disparity. And since it maintains that change is about the instantiation of fundamental presentness, it endorses Strong Temporalism.

Strictly speaking, the Moving Spotlight is an instance of Qualitative Temporalism for in its setting there are some qualitative propositions, for example the proposition that *someone* inhabits the present hypersurface, which are not about any particular individual and which are temporarily true. However, in proximity of this there is a question about how presentness affects higher-order phenomena concerning individuals. A way to do link the passage of time to higher-order phenomena is developing some bridge principle which links the instantiation of presentness with the instantiation of ordinary properties by ordinary entities. Deasy (2015, 2022) describes such a principle, which he calls About Presentness.

> **About Presentness:** For each property F expressed by an ordinary predicate, there is a permanent relation R such that F is the temporary property of bearing R to a present time.

In Deasy's words (2022: 1197), **'**About Presentness implies that ordinary predicates such as 'is sitting' express temporary properties of bearing certain permanent relations to a present time, so that e.g. the predicate 'is sitting' expresses the temporary (monadic) property of sitting-at a present time'. A bit less technically, ordinary monadic properties are instantiated only at the present time. Past and future times are times where ordinary monadic properties are not

instantiated. There is Qualitative Temporalism for qualitative truths about the instantiation of monadic properties are temporary, so, for example, the proposition that someone is a Roman general is only temporarily true.

Relatedly, following Sanford Rusell (2016), a distinction between *Pure* and *Impure* versions of Permanentism. A Pure version of Permanentism holds that permanent entities always have their qualitative profiles. An Impure version of Permanentism holds that permanent entities are subject to a change in their qualitative profiles. How much Pure and Impure a version of Permanentism is, is a matter of degrees. For example, views that maintain that non-present entities don't have any consciousness but are still concrete things with properties like mass and shape is purer than a view which maintains that non-present entities are in some sense not concrete and lack those properties.

A second instance is the *Minimal A-theory* – see Sullivan (2012), Williamson (2002, 2013) and Emery (2021). According to this view, in a nutshell, what's temporary about reality are those fundamental properties underlying concreteness, such as having a mass. This result in a view where ordinary entities are only temporarily concrete but always exist. While it is always the case that Caesar exists, it is only temporarily the case that Caesar is concrete. Right now, Caesar is an *ex-concrete* entity. The set of concrete things is identical to the set of the present things: past and future things are the things which used to and will be concrete. In this setting, change is about concreteness. A presupposition of this view is that there are things which are either no longer or not yet concrete. These entities are not concrete, but at the same time are in some robust sense different from abstract entities standardly conceived. To be clearer, on this view

not only are there abstract things such as numbers and properties, but also things which while not being presently concrete, *used to be* and *will be* concrete.[28]

I shall come back on this exotic kind of entities later on while discussing my own preferred Temporalist view. For now, suffice it to observe that the Minimal A-theory endorses Strong Temporalism and Qualitative Temporalism. It endorses the former for it claims that there are temporary fundamental properties. And it endorses the latter for it claims that there are temporary qualitative properties. As a matter of fact, the Minimal A-theory corresponds to the less pure version of Permanentism since it maintains that permanent entities transition from being concrete to being non-concrete. It is more intricate to establish what times are on this view, and relatedly whether this view accepts that there are spatiotemporal hypersurfaces. Williamson and Sullivan seem to be relatively neutral on this. Emery on the other hand is quite clear that they should be identified with physical entities. I shall set aside these exegetic issues. This notwithstanding, I believe that, at least as far it is assumed that there is such things as spatiotemporal hypersurfaces, there is a clear sense in which this view entails that a physical hypersurface is distinguished from the others – the hypersurface which is concrete.

A third instance is *Bacon's theory* – see Bacon (2018). According to this view, in a nutshell, there is change only in the derivative layer of reality. While fundamental truths are eternal, some derivatives truths are temporary. In Bacon's view, derivative and temporary truths are about the instantiation of a specific class of *time-shifted properties*, like *0-sitting*, *1-sitting*, *-1-sitting*.[29] The present time is identified with a function mapping indices to spatiotemporal

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[28] Orilia's (2015) Moderate Presentism involves a similar stance on becoming and concreteness, but Orillia classifies the view as a version of presentism.

[29] What's the nature of time-shifted properties? While it is relatively straightforward to define these properties in terms of tense logic, it is far from clear how their metaphysical profile has to be characterized. Bacon remains largely silent on this, and this might be seen as a weakness of his view.

hypersurfaces. In this setting, change is about the truth-value of derivative propositions about the instantiation of these time-shifted properties.

Bacon describes his view as endorsing Non-Physical Times, Moderate Temporalism, and Qualitative Temporalism. How the picture provided by this view has to be understood is not entirely clear, both because Bacon remains to a large extent neutral on this and because this view has been so far not fully explored in the literature. I shall not attempt to engage with the project of filling the details of Bacon's picture. But I wanted to introduce it for it will serve as a useful contrast case to my own considered theory.

A fourth instance is Dorr's unpublished theory – see Dorr (*Counterparts*). Dorr's view maintains that change is only about which qualitative roles individuals play. According to this view, in a nutshell, there is change only in the truth value of propositions about individuals – non-qualitative propositions in Bacon's (2019) sense. The present time is identified with a certain function, which Dorr qualifies as a 'counterpairing', mapping individuals to qualitative profiles within a spatiotemporal reality.

Although, also in this case, the details of the theory remain – at least to my knowledge – to a great extent unspecified,[30] the core idea is that Caesar gets mapped to its concrete stages within the block of reality via a temporal counterpart relation which transfers the qualitative profile of some three-dimensional stages which always occupy their location into a four-dimensional manifold. While it is always true that someone crosses the Rubicon, for example it is only

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[30] Besides in Dorr's own (incomplete) manuscript, cursory descriptions of his view can be found in Bacon (2018: 668-9), Sanford Russell (2015: 170; *footnotes* 13 and 14) and Deasy (2019).

temporarily true that Cesar crosses the Rubicon. Dorr's view is intended to subscribe to Non-Physical Times, Strong Temporalism, and Non-Qualitative Temporalism.

This list is not exhaustive, but hopefully provides a summary of the main Permanentist Temporalist views on the market.[31] We should now stop in proximity of a view about which these theories assume opposite stances. Consider Hypersurface Disparity:

> **Hypersurface Disparity:** A spatiotemporal hypersurface (a collection of simultaneous spacetime points) is metaphysically distinguished from the others.

Hypersurface Disparity is an instance of Physical Disparity. Notably, Hypersurface Disparity is obviously tied together with Physical Times. However, it is important to observe that there can be views which don't identify times with physical entities and yet imply that a physical entity such as a spatiotemporal hypersurface is metaphysically distinguished. For example, a version of the Moving Spotlight is conceivable where times are identified with propositions about which spatiotemporal hypersurface instantiates presentness. This view does not endorse Physical Times, but yet entails Hypersurface Disparity. Similarly, versions of Presentism have been developed which indeed endorse Non-Physical Times and yet embrace Physical Disparity.[32]

An important question is how the theories illustrated above relate to Hypersurface Disparity. The Moving Spotlight and the Minimal A-theory endorse it. The Moving Spotlight endorses it for (i) identifies times with hypersurfaces and (ii) maintains that the present time instantiates

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[31] There are other theories which can be classified as Permanentist Temporalist, even though the authors that develop them don't describe them in this way. For example, Miller's (2017) *Cresting Wave Theory* and Effingham's (2023) *Wave Theory*.
[32] See Markosian (2004).

presentness. The Minimal A-theory, at least as far as it assumes that there is such things as spatiotemporal hypersurfaces, endorses it for it maintains that only the points of one hypersurface are concrete.[33]

Dorr's and Bacon's view, by contrast, at least programmatically, don't endorse it. As a matter of fact, these theories are intended to be instances of Temporalism which don't entail that a hypersurface is metaphysically distinguished. They aim at endorsing Hypersurface Egalitarianism:

> **Hypersurface Egalitarianism:** All spatiotemporal Hypersurfaces are metaphysically on a par.

Hypersurface Egalitarianism is an instance of Physical Parity. These views are intended to endorse Hypersurface Egalitarianism for they both (i) identify times with non-physical functions rather than with hypersurfaces and (ii) maintain that there is *no* implication from the fact that a given time is distinguished to the fact that a hypersurface is distinguished. For example, Bacon's view holds that all the time-shifted properties which are mapped to hypersurfaces are metaphysically on a par and is thereby in principle able to endorse an egalitarian stance on hypersurfaces. Bacon's and Dorr's views, in sum, are views which aim at endorsing Non-Physical Disparity and Physical Parity.

Hypersurface Egalitarianism is attractive in that it matches one of the core tenets of *spacetime physics*. As we shall see in greater detail later on, spacetime physics provides a description of

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[33] But see Emery (2021) for a more careful discussion of the fraught relation between spacetime physics and the Minimal A-theory.

spatiotemporal reality which nowhere mentions the presence of a somewhat distinguished hypersurface. This applies both to Neo-Newtonian Spacetimes and to Relativistic Spacetimes, see Dorr (*Counterparts*, ch. 2). Although Hypersurface Egalitarianism in itself does not suffice for reconciling temporalist theories with Special Relativity, temporalist theories which are in a position to endorse Hypersurface Egalitarianism are better placed than temporalist theories which programmatically endorse the opposite view that one hypersurface is metaphysically distinguished. More generally, temporalist theories endorsing Hypersurface Egalitarianism are interesting in that they cut across the traditional distinction between A- and B- theories. Like A-theories, they endorse Temporalism and Temporal Disparity; and like the B-theory they maintain that all hypersurfaces are on a par.

	Strong Temporalism	Moderate Temporalism	Qualitative Temporalism	Non-Qualitative Temporalism	Physical Times	Non-Physical Times	Hypersurface Disparity
Moving Spotlight	Yes	No	Yes	No	Yes	No	Yes
Minimal A-Theory	Yes	No	Yes	No	Yes	No	Yes
Bacon's View	No	Yes	Yes	No	No	Yes	No
Dorr's View	Yes	No	No	Yes	No	Yes	No

I appreciate the insights and the novelty of Dorr's and Bacon's theories. My wish is developing a view which further develops their approach with respect to Hypersurface Egalitarianism (and a number of related thesis pressed upon us by spacetime physics). More particularly, I am

interested in describing a permanentist non-qualitative temporalist theory on the wake of Dorr's view.

1.5   Non-Physical Times as Perspectives

Before starting to consider Non-Qualitative Temporalism in depth, something more needs to be said about Dorr's and Bacon's overall approach. Let's step back to the thesis we called Non-Physical Times.

As said above, Non-Physical Times may serve the purpose of recovering truths about non-present time in a non-permanentist setting. And in fact, strategies built around Non-Physical Times have been first deployed by presentists in search of *ersatz* truth-makers for truths about the past and the future.[34]

Proxies: Non-Physical Times are proxies for non-present temporal events.

In these cases, Non-Physical Times play the role of *proxies* for non-present temporal events, like the past event that Caesar crosses the Rubicon, or the future event of there being human outposts on Mars.

Proxies is in fact built around a natural stance on what the theoretical role played by instants of time is. Instants of time are here assumed to be components of a *system of location* whereby things do in fact have a place in time. Proxies are meant to substitute this system of location without committing to non-present hypersurfaces. However, this *locational* role is not the only

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[34] Instances of this strategy are defended in Markosian (2004) and Bourne (2006) in a presentist context. The strategy tracks back to Prior (1968).

role that can be associated with time. As some have observed, there is also a *perspectival* role which times can play.[35] Eker, while discussing his own perspectivalist framework, recently made this distinction explicit:

> […] times lead somewhat of a double life: there are two fundamentally distinct roles associated with them. The first is the familiar locational role that consists in temporal regions' being occupied by certain entities. Perspectivalists hold that times also serve a further, distinctively perspectival function: they act as unique 'gateways' into some of the fundamental ways things are […] [2023: 41]

The perspectival role played by instants of time makes them essentially different from temporal locations: rather than being identified with physical entities such as portions of spacetime, in this context instants are conceived of as standpoints *on* spacetime and its contents.

Dorr's and Bacon's views – I think[36] – are best interpreted as endorsing Non-Physical Times with the purpose of representing perspectives on the contents of spacetime.

    Perspectives: Non-Physical Times represent perspectives on spacetime.

In particular, Bacon's view should be interpreted as claiming that there is a sequence of perspectives, which he identifies with certain mathematical functions from indices to spacetime

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[35] In a form or another this view appeared many times in the literature. Instances of it can be found, for example, in Skow's (2015: ch. 4) discussion of the theory he calls MST-Time and in Fine's (2005) discussion of Fragmentalism and External relativism. See Frischhut & Torrengo (2025) for a critical discussion of Skow's account.

[36] Bacon (2018: 675) is quite clear in distinguishing between the locational role played by instants and the role associated to instants in tense logic. The latter role is very much analogous to the role that I here qualify as perspectival.

regions, that constitute entry points on where in spacetime time-shifted properties are instantiated; and Dorr's view should be interpreted as claiming that there is a sequence of perspectives, which he identifies with counterpairings, that constitute entry points on which non-qualitative facts obtain in spacetime. And, in both settings, one of these perspectives is in fact the temporarily accurate and privileged one – the current standpoint on all of spatiotemporal reality.[37]

Non-Physical Times are here the locus of becoming: becoming is first of all about which overall perspective on spacetime and its contents obtains. What's distinctively temporal about reality is not something taking place within a spatiotemporal system of location, but rather a transition of perspectives *on* a whole spatiotemporal system of location.

This strategy allows to vindicate the principled possibility of egalitarian ambitions towards hypersurfaces. The obtaining of a perspective among the others makes for a disparity among perspectives. And indeed leads to Non-Physical Disparity, as seen above. But, since perspectives are not spatiotemporal, a disparity among perspectives does not obviously entail a disparity within the contents of spacetime. And indeed this provides space to Bacon and Dorr for denying that anything like Physical Disparity is entailed by their views. The view to be developed in this work has the very same fundamental ambition: constituting an example of a temporalist view which does not trivially entail Physical Disparity.

One objection against this overall conception of times as perspectives is that it opens up to repugnant metaphysical possibilities concerning change.[38] Consider the following scenario:

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[37] This marks a difference between Dorr's and Bacon's accounts and Skow's, who holds that there is no privileged perspectives among the ones at stake in MST-Time. Note thought that Skow briefly mentions the possibility of adding a privileged perspective to the theory (2015: ch. 4, appendix 4.4).

[38] Frischhut & Torrengo (2025) elaborate a similar reasoning against Skow's MST-Time.

Weird Change: Say that according to a non-physical time t, a red apple is located at spacetime region r. Say also that, according to a non-physical time t*, a green apple is located at spacetime region r. Assume that time *t* is now accurate and time *t** will be accurate. This comes with the implication that, once a transition between the perspectives represented by *t* and *t** will occur, spacetime will transition from containing a red apple in region *r* to containing a green apple in region *r*. That's a weird instance of change. Reality is not supposed to change in this way. Change is not random. Even in presence of change, there must some connection between the various stages of becoming: each stage of becoming, that is, each spatiotemporal reality associated with non-physical times, must exhibit some kind of continuity with the other spatiotemporal realities. Otherwise, the sense that *the same spatiotemporal reality* is changing is lost. Now, a theses like Non-Physical Times and Perspectives are dangerously entangled with this kind of implication and thereby look suspicious.[39]

The upshot of the reasoning above is that, once one follows the tackle on instants of time suggested by Perspectives, she ends up with weird metaphysical possibilities, like the possibility of weird change. And once one admits this possibility, then she must account for why such possibility is non-actual. Friends of Perspectives then have an additional explanatory burden, which is prima facie avoided by those that don't endorse the view that times play a perspectival role. It's hardly seen how this can be achieved. One solution I can think of is

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[39] This scenario is concerned with qualitative change. The scenario can be phrased also in terms of non-qualitative change, for example as involving two perspectives on weird non-qualitative facts, like the fact that according to one perspective I play the role of Donald Trump and according to another, future perspective I play the role of Julius Caesar. This connects to some further questions arising in a non-qualitative temporalist setting, having to do with what explains that I play the role of a given individual as opposed to another – see Chapter 2. I am inclined to think that non-qualitative temporalists might give a unified solution, if any, to both the problems at stake, by finding some persuasive correlative relation between individuals a given set of qualitative roles within spatiotemporal reality. But that's a topic for another occasion.

nesting some constraint on what can constitute a sequence of perspectives. For example, one can consider postulating that the spacetimes involved into perspectives must satisfy some requirement, e.g. being causally consistent each other or being all qualitatively alike. But this kind of strategy seems to lend the hip to the further contention that competing theories which don't endorse Perspectives don't have to run into this sort of ancillary commitments and complications while developing the basics of their view. Skow, who plays with a similar metaphysical machinery, seems to suggest that one should just assume as a brute fact that weird change does not actually occur (2015: 60-61). And I think in this case friends of Perspectives should resort to a similar stance, with the hope that their accounts will repay these initial foundational costs.

1.6   Sharing Temporalism

Let's now delve into Non-Qualitative Temporalism. As noted above, the core insight of Non-Qualitative Temporalism is that there is change only in the truth value of propositions about specific individuals. In light of this, it should be assumed that any non-qualitative temporalist theory will hold that while it is temporarily true that a specific induvial – Caesar – crosses the Rubicon in 32 BC, it is atemporally true that *someone* (instantiating the properties associated with the Roman General identical to Caesar) crosses the Rubicon in 32 BC. The fact a Roman General named Caesar and possessing a relevant lifetime crosses the Rubicon is seen as an atemporal element of reality. What is temporary just is the fact that Caesar himself is not always involved in this fact.

There are many questions arising here. Some are about what is the nature of qualitativeness, and some are about what is the nature of individuals involved in this picture. I shall not tackle the former for I believe that, although obviously interesting in themselves, they will not affect

so much how a non-qualitative temporalist theory should be developed. But I shall tackle the latter for I believe that, upon reasoning about how individuals (and a number of issues related to them) should be understood, interestingly different versions of Non-Qualitative Temporalism can be singled out. This being said, I shall come back to individuals in the next section. In the present section, I wish to present a temporalist thesis which in my view is (i) intimately linked to Non-Qualitative Temporalism and (ii) endorsed by many variants of Non-Qualitative Temporalism.

Now, let's say that the involvement of individuals in qualitative facts is temporary as Non-Qualitative Temporalism implies. How could this be the case? How could it be that it is temporarily true that Caesar crosses the Rubicon in 32 BC and yet atemporally true that someone crosses the Rubicon in 32 BC? Non-Qualitative Temporalism in itself does not provide a story about this, and Dorr, in developing his own view does not explicitly tackle this issue. However, I believe the issue is serious and not trivially handled. It is serious for it is about a crucial presupposition of Non-Qualitative Temporalism, and it is not trivially handled for it is hard to tackle it without ending up with some metaphysically loaded answer that might not apply to all non-qualitative temporalist theories in the conceptual space.

A thought that I want to explore is that, in order for a non-qualitative temporalist picture to obtain, there have to be three things (i) individuals like Cesar, (ii) entities which serve as the atemporal bearers of the qualitative profiles instantiated by individuals, and (iii) a temporary relation which in some way connects the qualitative profiles of atemporal bearers to individuals. While I am not sure this thought applies across all the possible instance of Non-Qualitative Temporalism, I am confident that it applies in a good spectrum of cases – some of which I will closely describe.

Now, I take (i) and (ii) to be relatively harmless and unsurprising elements of my account. After all, it is not easy to see how an instance of Non-Qualitative Temporalism can be developed without presupposing a distinction between individuals like Caesar and atemporal bearers. I take (iii) to require a bit more of explanation. The core insight supporting the connecting relation at stake in (iii) is that it accounts for how there can be temporary non-qualitative truths. Those truths are temporary for the connecting relation linking individuals to atemporal bearers is temporary. This relation has in some way to link the qualitative properties of atemporal bearers to individuals, for those qualitative properties are involved in the temporary non-qualitative truths.

What is the nature of the relation at stake? I believe the relation should be characterized as a *sharing relation* which grasps the fact that a given set of properties can be shared between an atemporal bearer and an individual.

Sharing: If a sharing relation holds between the set of properties P instantiated by a bearer B and an individual I, then I instantiates the set of properties P.

As stated here, the sharing relation is overly general and neutral. But it can be further characterized. One way of further characterizing the sharing is in terms of *supervenience*, where the properties instantiated by an individual supervene on those instantiated by an atemporal bearer; another way is in terms of *grounding*, where the properties instantiated by an individual are grounded in the properties instantiated by an atemporal bearer. Although this matter will connect to intriguing issues in temporal metaphysics, particularly the question of

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temporary necessities,[40] I shall stay neutral on this matter in what follows and stick to sharing as characterized above.

There are different versions of sharing in the conceptual space. One version of sharing, which I label *Imperfect Sharing*, holds that the properties shared between an individual through the sharing relation are instantiated by the individual relative to some further dimensional parameter (a parameter belonging to the temporal and modal dimension, for example).

> **Imperfect Sharing:** If a sharing relation holds between the set of properties P instantiated by a bearer B and an individual I, then I instantiates the set of properties P relative to a dimensional parameter.

The parameter at stake is determined by the primary instantiation of the atemporal bearer. For example, if a bearer which exists at time *t* instantiates a set of properties shared with and individual, then such individual instantiates *relative to t* such set of properties.

Another version of sharing is *Perfect Sharing*, which holds that the properties shared between an individual through a sharing relation are instantiated simpliciter (that is, with lack of relativization to a parameter) by the individual.

> **Perfect Sharing:** If a sharing relation holds between the set of properties P instantiated by a bearer B and an individual I, then I instantiates simpliciter the set of properties P.

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[40] Wait till Chapter 2 for more on this.

Both Imperfect and Perfect Sharing have been discussed in the literature, although in terms slightly different than those employed here.[41] Imperfect Sharing proves useful when one wants to hold that the sharing relation holds between many bearers and one individual, e.g in the case of perdurantism. In these cases, Imperfect Sharing secures that an individual does not instantiate incompatible sets of properties. Perfect Sharing proves useful when one wants to maintain that the sharing relation is a two-place relation, holding between only one bearer and *only one* individual.

While both Imperfect and Perfect Sharing are in the conceptual space, it is clear that Perfect Sharing is the one which is naturally coupled with Non-Qualitative Temporalism. Non-Qualitative Temporalism aims at developing a picture where is sometimes true and sometimes not true that Caesar crosses the Rubicon. As said above, it is a presupposition of Temporalism that propositions don't involve temporal parameters but can be true simpliciter. If Imperfect Sharing were to hold in a non-qualitative temporalist setting, this basic tenet of Temporalism would get lost. If Caesar were to instantiate the properties of more than one atemporal bearer through an imperfect sharing relation, then, for example, it would be true relative to two different temporal parameters that Caesar crosses the Rubicon and that Caesar is stabbed by Brutus – which of course goes astray from any picture that Temporalism in general wants to vindicate.

Accordingly, the sharing relation at stake in Non-Qualitative Temporalism is a Perfect Sharing relation which holds temporarily:

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[41] Something very much kindred to the sharing relation has been discussed under the name of 'Inheritance' in works by, among the others, Hawthorne (2006), Sider (2007) and Roelofs (2016).

Perfect Sharing Temporalism: truths about perfect sharing relations between an individual and atemporal bearers are sometimes true and sometimes not true.

So, the relation at stake in the third point of my characterization of the core elements of Non-Qualitative Temporalism has been elucidated. However, individuals and atemporal bearers have not been characterized yet. At this stage, individuals and atemporal bearers are just placeholders to be filled. How individuals and temporal bearers should be understood is something on which different instances of Non-Qualitative Temporalism will disagree. In the rest of this chapter I will in fact explore, though not endorse, what I take to be a *prima facie* intriguing instance of Non-Qualitative Temporalism.

1.7   A Bad Theory

A *prima facie* attractive insight is nesting Perfect Sharing Temporalism in the context of the *perdurantist* theory of persistence, which, in rough outline, holds that persisting entities are to be identified with aggregates of temporal parts – perduring *worms*.[42] This idea is particularly natural for in such a context there is a sharp distinction between entities which can play the role of individuals and entities which can play the role of atemporal bearers. In particular, it can be held that individuals like Caesar should be identified with entire aggregates of temporal parts, and that atemporal bearers should be identified with three-dimensional stages which are a worm's temporal parts. Furthermore, a standard perdurantist setting already presupposes that temporal parts instantiate the same properties of perduring worms and that there is an imperfect sharing relation between parts and worms. It can be thought that the only variation that a non-

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[42] See Sider (2001) for a classic discussion of perdurantism. A much more detailed introduction to perdurantism will be given later on in this work, when addressing some issues concerning consciousness and temporal metaphysics. For now, it suffices to work with a coarse-grained picture of the view. A more detailed presentation of perdurantism will be offered in Chapter 5, while discussing a consciousness-based argument in favor of Temporalism.

qualitative temporalist view has to intrude in a perdurantist setting is that the sharing relation is temporary and perfect, in such a way that a worm temporarily instantiates the set of properties of one of its temporal parts.

Temporalist Perdurantism: truths about perfect sharing relations between a perduring worm and a temporal part are sometimes true and sometimes not true.

A view of this sort, however, is faced with important difficulties. The most important difficulty is about the sharing of properties. As stated above, Perfect Sharing Temporalism presupposes that all the qualitative properties instantiated by a given atemporal bearer are instantiated by an individual. This presupposition may look harmless. However, it is hardly tenable in a perdurantist setting, for it is hardly the case that a temporal part can temporarily share each and every property with a perduring worm. To see this, consider an implication of Non-Qualitative Temporalism. In a non-qualitative temporalist setting, some atemporal bearers have to instantiate their properties without these properties being shared with an individual (either because those properties used to be shared or because they will be shared). So, within this setting a scenario where the sharing between an individual and one of the bearers related to it fails is an actual scenario. The problem is that in a perdurantist setting this scenario can hardly be actual.

The fundamental relation between a worm and its temporal parts is a *parthood* relation. As a matter of fact, parthood is involved in the very definition of what an ordinary object is: a worm is a mereological aggregate of temporal parts. A natural thought is that parthood and the sharing relation are tied together. They are tied together in that, at least in the case of some properties, parthood appears to necessitate the sharing relation. That is to say, there are cases where one

thing cannot be part of another without the properties of the former thing being shared with the latter thing. The most notable instance of these properties are locational properties. If an entity has as a part an entity which possess some temporal or spatial location, then it is a conceptual necessity that such entity instantiates some locational property which results from a sharing relation with its part. As a matter of fact, it is hard to imagine how a perduring worm could have a part located somewhere without being in itself located somewhere. Since the view at stake, much as like any perdurantist view has to presuppose that perduring worms atemporally have many temporal parts, then it faces an issue about how it could be the case that some properties are only temporarily shared with worms while being atemporally instantiated by temporal parts. A natural reaction to this worry is maintaining that the temporariness of the sharing should be restricted to a class of properties whose sharing is not necessitated by parthood. But, I believe, the problems entangled with this solution overcome the relief it provides.

To see this, let's tackle the question in much greater detail. So, is there a class of properties which can serve the purpose of the strategy at stake? As some have argued – most notably, Chalmers (2016) and Roelofs (2019) – most classes of properties behave on the example of locational properties: if instantiated by the parts, then they have to be in some way reflected in the nature of the whole via a sharing relation. This applies to property such as mass and charge, as well as to properties underlying colour, shape and other similar classes of properties. This notwithstanding, there is one interesting exception that might suit the friends of the view under examination here: *mental properties*. Properties underlying mental states such as experiences, attitudes and beliefs – however metaphysically understood – seem not to imply sharing in the

way in which the other properties do.[43][44] By contrast to locational properties, we can conceive a failure of sharing in the case of mental properties even when parthood relations are involved. This is especially evident when aggregates of conscious entities are taken into account. A distinction can be made between a *mere aggregate of conscious entities* and a *conscious aggregate of conscious entities*. While the former is a collection of conscious temporal parts which is not conscious in itself, the latter is a collection of conscious temporal parts which is conscious in itself. While there is something that feels like being the latter, there is nothing that feels like being the former. Even though each part of an aggregate is conscious, it does not conceptually follow from this that the aggregate is conscious as well. Relatedly, the same applies to the properties which underly our having attitudes and beliefs. It is possible to distinguish between an aggregate which is made of temporal parts which have beliefs and attitudes but has not beliefs and attitudes in itself, and an aggregate which is made of temporal parts which have beliefs and attitudes and has beliefs and attitudes in itself. While there is nothing that the former believes and with respect of which has attitudes, there is something that the latter believes and with respect of which has attitudes.[45]

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[43] This feature of mental properties brings about a problem for those views that aim at establishing that the sharing of mental properties is a a matter of necessity, most notably panpsychism. Roelofs (2019) discusses this problems and puts forward some solutions to it.

[44] Notably, this feature concerning the conceivability of shared mental properties obtains regardless of what metaphysics of mind is assumed in the background.

[45] Incidentally, the fact that mental properties don't conceptually entail sharing is relevant to a number of issues. Consider mereological universalism, the view according to which there are no conditions which restrict mereological composition. According to this view, there is an aggregate which comprises, for instance, the temporal parts of Caesar and Joe Biden. Given that Caesar and Joe Biden have conscious temporal parts, this aggregate is an aggregate of conscious entities. It is, however, an entirely different question whether this aggregate of conscious entities is also a conscious aggregate. That is, it is a further question whether the sum of Caesar and Joe Biden has some sort of consciousness. Certainly, mereological universalism does not conceptually entail that such aggregate is conscious. It is a conceptual possibility to deny that there is anything that feels like being the sum of Caesar and Joe Biden, and presumably this is what some universalists would be willing to do when handling the weird mereological sums that they postulate. Additionally, it is worth noting that the issue at stake relates to some recent debates concerning group agency. While it is obvious that a group which comprises all the inhabitants of United States is made of agents which have mental properties, it is not trivial to establish whether the entire group – the United States – has such properties as well – see Schwitzgebel (2016) and List (2018) for contrasting stances on this. Certainly, the mere consideration of judgements concerning conceivability does not settle this debate.

Of course, a conceptual entailment is not the only sort of entailment in play in sharing. There might be other sorts of necessities which link the properties of the parts to the perduring worm. But I want to grant that considerations of this sort licence the strategy at stake and allow one to maintain that Sharing Temporalism can be restricted to mental properties. What I believe is that, even when a restriction to mental properties is granted, the view faces objections which ultimately impinge its overall plausibility.

A crucial implication of restricting Sharing Temporalism to mental properties is that Temporariness turns out to be irreducibly entangled with the presence of mental properties. As a matter of fact, since in the setting at stake Temporalism is entirely built around the notion of sharing of properties, it turns out that their temporariness depends on mental properties. So, in this setting there is passage of time only if there is consciousness. This implication is something hard to accept. For one, it is repugnant and implausible in itself. Why should the passage of time be so much entangled with consciousness? There are good reasons for thinking that the passage of time affects consciousness – some of which I will myself argue for later on in this work. But it is overwhelmingly weird to assume that consciousness affects the passage of time in such a way that the presence of temporal passage is conditional on the presence of mental properties.[46] Furthermore, since consciousness is plausibly a phenomenon which holds in some but not all possible worlds, temporariness turns out to be a merely contingent phenomenon. And in turn this contrasts with the natural assumption that Temporalism holds necessarily rather than contingently.

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[46] At least while one is developing a temporalist theory. The view that temporal passage is a feature of human consciousness is instead popular among atemporalists. See, for example, Torrengo (2017) and Sattig (2019).

Additionally, even if one is willing to endorse the view that temporalism depends on consciousness and is merely contingent, there still remains the issue that it is largely unexplained why mental properties should be so much intimately related with temporariness. The mere compatibility of mental properties with the conceptual demands of Sharing Temporalism does not in itself explain why Temporariness could arise only once mental properties are instantiated. But such mysterious link between Temporariness and mental properties is exactly what this view postulates. And I really don't see how such link can be explained and motivated with reasons which don't appeal to the mere dialectical need to respond to the worries introduced while discussing locational properties. Nor do I think that a mystery of this sort is analogous to the primitive facts that other views postulate, e.g. that there are temporary truths about the instantiation of presentness. For, in the present context, the mystery is not about the obtaining of Temporariness itself, but rather about the obtaining of temporariness in the case of one class of properties as opposed to another.

In sum, I think we should regard a restriction of Sharing Temporalism to mental properties to be an unacceptable move which undermines the plausibility of the whole view. I used to be intrigued by this view.[47] But this is a bad instance of Sharing Temporalism and I don't recommend its adoption. Reflecting on this view and on the objections that plague it, however, shall prove useful as it allows to pay attention to another view which shares a similar spirit but possesses a greater plausibility. In the next chapter, I turn to such a view.

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[47] This view was the original bearer of the name 'Disclosing Window', which is now possessed by a hopefully better theory.

Chapter 2   The Disclosing Window Theory

In this chapter, I introduce and discuss the instance of Non-Qualitative Sharing Temporalism that I will explore and defend in the rest of this work. First, I present the theory, which I label *Disclosing Window Theory*. Then I review some issues revolving around the picture provided by the Disclosing Window, with a special focus on how it relates to the temporal status of necessary truths and the Epistemic Objection raised against A-theories of time.

2.1   A Better Theory

So, let's consider again Sharing Temporalism. If not worms and their parts, what kind of entities could be involved in the temporary sharing relation?

The core assumption of the *Disclosing Window Theory* (DW) is that two permanent classes of entities populate reality. On the one hand there are temporarily *non-concrete entities*, analogous to those postulated in the Minimal A-theory briefly presented in Chapter 1. Just like in the Minimal A-theory, these entities always exist and are sometimes concrete. As time passes, they transition from concreteness to non-concreteness. For short, I shall label these entities 'concretables'. On the other hand, there are permanently concrete *three-dimensional stages*, analogous to those stages postulated by some theories of persistence, such as perdurantism and the stage theory. By contrast to concretables, these entities are always concrete and always have the (unique) spatiotemporal location that they have as well as their properties. Within DW, ordinary entities like tables and persons are identified with concretables as opposed to stages.[48]

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[48] Question: Is this a theory of persistence, and if so, how should it be classified? I believe this is a theory of persistence in that it provides an account of how ordinary entities exist at different times. And, despite the

DW postulates that a perfect sharing relation holds between a stage and a concretable, in such a way that the properties instantiated by the stage are instantiated *also* by the concretable. DW also postulates that this relation is temporary, in such a way that the properties instantiated by a stage are sometimes instantiated by a concretable and sometimes not instantiated by a concretable. This is an instance of Perfect Sharing Temporalism, where truths about perfect sharing relations between an individual and atemporal bearers are sometimes true and sometimes not true. In this setting, concretables are the parasites, and stages are the primary bearers.

Let's review this picture with an example. If the sharing relation holds between Caesar and a stage which is located at a hypersurface where is crossing the Rubicon, then Caesar instantiates the property being located at a hypersurface where is crossing the Rubicon as well. In general, the only way of concretables to go into concreteness is via the sharing relation. Within DW, the sharing relation is temporary. That is to say, it sometimes obtains and sometimes does not obtain. This yields the result that concretables are sometimes concrete and sometimes not concrete. Before the sharing obtains, concretables are not yet concrete entities; and after the sharing obtains, concretables are no longer concrete entities. Yet, regardless of whether the sharing between them and a concretable obtains, stages always instantiate their properties. The block of reality is always filled with concrete permanent stages that instantiate their properties. For example, if one zooms in the block, there will always be a stage crossing the Rubicon in

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postulation of stages, I believe that classifies as a version of endurantism, for, thanks to the sharing relation, concretables temporarily 'inherit' the spatiotemporal location of a stage which is exactly located at one single time (or, more correctly, at one single achronal region – see Gilmore (2006)). As a consequence, across time, concretables have many different exact spatiotemporal locations (although, at each single time, they have only one exact location, provided that the sharing relation with stages is temporary). I leave to another occasion a discussion of the present theory qua theory of persistence. In the present work, am interested in using this framework for developing a temporalist theory of time. I shall come back on how the picture of ordinary entities put forth by DW relates to consciousness and persistence in Chapter 5.

39 BC to be found. The sharing can be figuratively described like a window which is sometimes open and sometimes closed – hence the name of the theory. When open, it discloses to a concretable the set of properties of a stage; when closed, it makes it completely inaccessible. But its openness and closure does not affect the reality of the properties, which remain always the same.

As noted early on, DW is very much kindred to Dorr's view, at the very least for the reason that it constitutes an instance of Non-Qualitative Temporalism. How much my view overlaps with Dorr's own theory is a question I shall not address. It might be that what I shall say, rather than positing the grounds for an altogether novel theory, will constitute a mere gloss on Dorr's intended picture of temporal reality. For lack of access to the current state of development of Dorr's view, I am not clear about this and I shall not venture into a comparison between my view and Dorr's account. I am happy enough if I will manage to introduce and argue for a theory which elaborates on Dorr's insight and which offers to temporalists a distinctively attractive and so far largely unnoticed picture of temporal reality.

This picture may remind the picture put forward by the Minimal A-theory. The similarities with the Minimal A-theory, however, are striking, but altogether superficial. In the Minimal A-theory, the transition into and from concreteness of concretables entails qualitative temporalism. This is because in the setting of the Minimal A-theory the only entities which could have a temporal location and instantiate properties are concretable entities. If Caesar does not instantiate the token property of crossing the Rubicon, nobody else does that. The qualitative proposition that someone is crossing the Rubicon turns out to be only temporarily true. By contrast, within DW, if Caesar does not instantiate the property of crossing the Rubicon, there will always be a stage doing that. While the non-qualitative proposition that

Caesar is crossing the Rubicon turns out to be temporarily true, the qualitative proposition that *someone* is crossing the Rubicon turns out to be always true.[49] More generally, while in the Minimal A-theory the passage of time comes with an alteration of the qualitative furniture of reality, the same does not go for DW. As announced previously, DW is an instance of Non-Qualitative Temporalism. As a result, DW, while appealing to a transition in the concreteness of concretables, provides a picture of temporal reality sensibly different from the one put forward by Minimal A-theorists.

Notably, DW does not come with the deadly issues entailed by the instance of Sharing Temporalism that we have considered in the last section of Chapter 1. This is because the temporariness of the sharing in the present case is absolutely free to obtain across all sorts of properties, with no restriction. In particular, since the relation between a concretable and a series of stages is not a parthood relation, locational properties can be fully treated as temporary properties, in such a way that a concretable has a temporary location. Thus, no scenario where only mental properties are temporarily shared is involved here. In DW's setting, even things which don't instantiate mental properties are in fact involved in temporariness: a chair, for example, temporarily instantiates all sort of properties (shape, mass, and so on) thanks to being involved in the sharing relation with the relevant series of worldly stages. As a consequence, temporariness is not bound to the presence of mental properties in any mysterious way. And, relatedly, temporariness doesn't have to be seen as contingent, for the obtaining of temporariness is not contingent on the presence of mental properties or on qualitative properties more generally. Rather, temporariness can be expected to obtain across those worlds which

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[49] Or, more precisely, the proposition that a Roman general with a given lifetime is crossing the Rubicon.

have room for qualitative properties in general – which can be plausibly identified with a set comprising all the possible worlds.[50]

Finally, let me say something on the nature of the concretables postulated by DW. As noted while discussing Permanentism and the Minimal A-theory, concretables are entities which can exist while not being concrete. This may look mysterious as it is tempting to analyze the property of not being concrete as equivalent to the property of being abstract. In such a case what DW would be entailing is that there are things which, thanks to the sharing relation, transition from being as abstract as numbers to being as concrete as tables. But, as noted by Williamson (2013: 7), proponents of concretable entities should not endorse this equation, and must indeed claim that not being concrete should not be equated to being abstract.[51] As Williamson puts it (2002: 18):[52]

> We should not assume that the only alternative to being concrete is being abstract. When Trajan died, he did not become an abstract object, although he ceased to be concrete. He did not become the value of some abstraction operator. He became something neither abstract nor concrete, but something that had once been concrete. Trajan is an ex-concrete object.

This results into a picture where, in additional to concrete and abstract things, there is a third category of entities, those things which are not presently concrete. These things are mostly

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[50] This stays neutral on whether there might be haecceitistic differences between worlds. The argument above merely relies on the fact that a necessary and sufficient condition for temporariness is that there are qualitative properties. But in turn, the presence of qualitative properties seems to be widespread across all possible worlds.

[51] This applies to the modal discourse as well (with which Williamson is concerned in the first place), but I shall here confine my discussion to the temporal application of the view.

[52] Williamson of course doesn't have DW in mind here, but what he says applies to DW as well.

described in negative terms. They are described by appeal to what they used to be and what they will be.[53]

The postulation of concretables, of course, while not untenable in itself, might well be controversial for some. But metaphysical views have to start from some possibly controversial assumptions in the first place, with the ambition that those possibly controversial assumptions will pay off in some relevant sense. I believe the salient question to raise in the present setting is not about whether the adoption of concretables is nefarious for DW. The most interesting question is about whether the adoption of concretables in the case of DW is *more nefarious* than in the case of other views that start from similar assumptions, such as, of course, the Minimal A-theory. I don't think that the adoption of concretables plays such a nefarious role in the case of DW. Of course, a difference between DW and the Minimal A-theory is that DW maintains that concretables become concrete thanks to the sharing relation, rather than by mere instantiation, of their qualitative profiles, in such a way that the qualitative profiles which are sometimes instantiated by concretables are always instantiated by stages. But such a difference in how concretables acquire their properties hardly makes concretables more or less plausible than they are in themselves.

2.2   Instants

With the fundamental picture provided by DW in place, let's now focus on the status of instants of time. DW share's with Dorr's and Bacon's view the adoption of the theses that in Chapter 1 we called Non-Physical Times and Perspectives.

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[53] Although, as discussed in greater detail below, this does not entail that there could not be sortal differences among different concretables

Non-Physical Times: Times are identical to some non-physical entities, e.g. propositions.

Perspectives: Non-Physical Times represent perspectives on spacetime.

The core upshot of DW, however, is that instants of time, rather than with counterpairings and functions, should be identified with propositions. This is a choice point, though, and in principle one can follow Dorr and Bacon in adopting a mathematical formalism to represent instants.[54]

Deasy & Banfi in their (2021), in the context of a discussion of presentism,[55] develop a systematic framework for identifying times with propositions.[56] In this section, I show how this framework can be applied to DW.[57]

Instants of time are identified with Instant Propositions.

Times: There are instants of time and they are identical to Instant Propositions.

Instant Proposition: For any p, p is an instant propositions iff it is maximal, consistent and sometimes true.

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[54] A reason for doing so is dispensing DW from presupposing primitive tense operators. I shall not investigate this thought further in this occasion.

[55] Deasy and Banfi don't endorse the view but discuss a number of issues in its proximity.

[56] Markosian (2004) and Bourne (2006) apply a similar framework to their versions of presentism.

[57] The principles and definitions discussed in this section are indeed borrowed from Deasy & Banfi (2021), though of course the core idea of understanding times as propositions has a long history, tracking back to Prior (1968).

An Instant Proposition I is maximal if and only if for any p, either I entails p or not p. An Instant Proposition I is consistent if and if and only if there is no p such that I entails both p and not p.[58] And an Instant Propositions I is sometimes true if and only if either I is true, was true or will be true.

In turn, some related notions are defined as follows.

Truth at a Time: For any p and time t, p is true at *t* iff *t* entails p.

Presentness: For any Instant Proposition I, I is present iff I is true.

Truth at a Time grasps the idea that times legislate on truth: something is true at a time just in case the Instant Proposition which is identical to that time entails it. In this setting Presentness is identified with truth. For a time to be present it is for such time to be true. The present time is the Instant Proposition which is true, the past and future times the Instant Propositions which *used to be* and *will be* true.[59][60]

Finally, a precedence relation between times can be introduced. Instant propositions are ordered by a transitive and asymmetric earlier than relation which gives them an ordering. One

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[58] These glosses deviate a bit from Deasy's and Banfi's original definitions, which are developed in terms of 'necessarily' rather than 'always'. The definitions introduced in the main text presents some advantages in that they allow to disentangle Instant Propositions from some unwelcome modal implications. Notably, they avoid the implication that, for any t, such that at t, p, it couldn't have been the case that not-at t, p. As a consequence, they are capable of accounting for the intuition that, although it is true that I am sitting at this time, it could have been the case that I am not sitting at this time. Thanks to Daniel Deasy here.

[59] As Deasy & Banfi note (2021: *footnote* 4), this understanding on Instant Propositions presupposes primitive tense operators.

[60] Question: how does DW's commitment to Non-Physical Times relate to the thesis that in the last section we called Physical Disparity? That is to say, does DW entail that there is something special about one portion of reality as opposed to the others, e.g. that a spatiotemporal hypersurface is metaphysically distinguished? I shall come back to these questions in Chapter 4, with the purpose of arguing that DW does not in fact entail that a spatiotemporal hypersurface is metaphysically distinguished.

can either maintain that such relation is fundamental and not analyzable in further terms, or, more plausibly in my view, provide a reductive analysis of it. A natural reductive analysis suggested by Deasy & Banfi has it that a time t precedes a time t^1 if and only if whenever t is present then t^1 will be present.

Precedence: For any times t^1 and t^2, t^1 is earlier than t^2 =def whenever t^1 is present, t^2 will be present

The resulting picture is clear: times are identified with Instant Propositions and one Instant Proposition among the others is temporarily true.

Deasy & Banfi's framework can be quite straightforwardly applied to DW. Since DW postulates a hugely limited class of temporary non-qualitative propositions, the maximal sequence of Instant Propositions can be thought of as a sequence of vastly similar Instant Propositions which diverge on the truth value of non-qualitative propositions involving concretables. In particular, each Instant Propositions is constituted by the same body of eternal non-qualitative truths plus a variable set of non-qualitative truths.

Instant I: Qualitative Truths + Non-Qualitative Truths*

Instant II: Qualitative Truths + Non-Qualitative Truths**

Instant III: Qualitative Truths + Non-Qualitative Truths***

Figure 1: Instances of Instant Propositions: eternal truths are underlined.

A side effect of this setting is that there are also higher-order temporary truths about the sharing of properties and its timing. So, for example, there are higher-order truths about the fact that a given set of properties is/used to be/will be shared with a concretable and higher-order truths about the fact that a given set of properties used to/will be shared with a concretable in n time units.[61] Notably, these truths are still non-qualitative as an individual concretable is involved into them. Furthermore, since truths about the time-shifts of sharing are ultimately peculiar instances of truths about non-shared properties, these truths have no bearing on the qualitative profile of reality, since as seen above the sharing of properties does not affect it.

In the resulting picture, the presentness of one time as opposed to the presentness of another makes a difference only for what non-qualitative truths are true. In accordance with Perspectives, instants of times are entry points on certain salient non-qualitative features of spatiotemporal reality.

Yet, the non-qualitative variation brought about by a transition into which Instant Proposition is true is not shallow. Within DW, concretables are subject to the highest degree of qualitative change. Not only a concretable goes from having no qualitative profile to having one. It also goes from having a given qualitative profile (the one that a stage A shares with her), to having a numerically different qualitative profile (the one that a stage B shares with her). Since within DW ordinary entities are identified with concretables, this entails that within DW ordinary entities are subject to the same amount of qualitative change that occurs in other A-theories, such as presentism. As a consequence, at least as far as ordinary entities are concerned, DW is, so to speak, as robust as the most robust A-theories. More importantly, DW is perfectly fit to

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[61] Note that these time-shifts are difference from those postulated by Bacon for their metaphysical nature is clarified as being failures of the sharing relation, whereby the property of having being shared n units ago just is a specific instance of the property of not being shared.

satisfy the explanatory goals which A-theories are expected to accomplish. According to some[62] -- and rightly so, in my opinion –, an explanation is needed for why the consciousness of persisting individuals comprises the experiences associated with only one specific time within their lifetime as opposed to the experiences associated with all the others. DW can adequately explain this. My consciousness, for example, presently exclusively comprises experiences of drafting a chapter on 16/06/2024 at 3:28 PM for the only stage that temporarily shares properties with me is a stage which is drafting a chapter on 16/06/2024 at 3:28 PM. All the other stages of mine either used to or will share experiences with me, and this is why I don't access their experiences.[63]

I think DW comes with notable attractions, having to do with the objection based on spacetime physics that is raised against temporalist theories. Chapter 3 and 4 will be devoted to elucidating how DW relates to this objection. In the remaining of the present chapter, I shall illustrate and discuss some issues revolving around the picture provided by DW.

2.3   Sortals and Individuals

What is the relation between a concretable and the stages that share properties with it? This question splits into two separate sub questions.

Sortal-Question: Why does a concretable instantiate properties associated with a specific sortal, e.g. with persons as opposed to inanimate objects.

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[62] Balashov (2005, 2015, 2018), Parsons (2015) and Goff (2015) develop versions of this reasoning. Skow (2011, 2015) and Torrengo (2024) discuss and eventually reject them.
[63] Of course, a question is whether anything like the explanation envisaged here is genuinely needed. Many believe that, in order to secure a plausible picture of consciousness, Temporalism is not needed – an atemporalist setting will suffice. I sidestep this concern for now, but I will come back on this later on in Chapter 5, while discussing the core motivations for DW (and Temporalism altogether).

Individual-Question: Why does a concretable instantiate the properties associated with a specific individual, e.g. Caesar as opposed to Brutus?

The Sortal-Question requires an explanation for why the concretable identical to Caesar instantiates properties associated with a person. The Individual-Question requires an explanation for why the concretable identical to Caesar instantiates the properties associated with a Roman General named Caesar with stages distributed across a lifetime spanning from 100BC to 44BC.

A way to answer the Sortal-Question is by introducing some (minimal) sortal restriction on the principled nature of concretables. For example, it can be maintained that there is a sortal according to which, if a concretable is concrete, then such concretable instantiates the properties associated with personhood. And, relatedly, that there is another sortal according to which, if a concretable is concrete, then such concretable instantiates the properties associated with being an inanimate object. The falling of Caesar under the former sortal explains why Caesar instantiates, via a sharing relation with stages, the properties associated with personhood as opposed to those associated with being an inanimate object.[64] The falling of a concretable under a given sortal, of course, should not be analysed by appealing back to the fact that the concretable at stake temporarily shares properties with stages that possess properties associated with that sortal, but should rather be taken as a primitive fact about the concretable itself. It is this very fact which explains why concretables share properties with a

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[64] A version of this strategy is envisaged by Williamson (2013: 8) for rephrasing essentialist claims in a necessitist and permanentist context.

specific class of stages as opposed with another, thereby answering the Sortal-Question. As we shall see in Chapter 4, the appeal to sortals shall prove useful also in a relativistic setting.

A way to answer the Individual-Question is by introducing a special relation which links concretables with spatiotemporally localized stages. Such relation brings about a special intimacy between a concretable and a class of stages and thereby explains why a concretable instantiates the properties associated with a specific person as opposed to another. Candidates for this relation are parthood and a counterpart relation. Each of them has its own drawbacks. Endorsing the parthood-view entails the possibly unwelcome implication that parthood can hold promiscuously between concrete and non-concrete entities. Endorsing the counterpart-view entails a possibly inappropriate usage of the counterpart relation. In particular, it may be asked why a concretable is a counterpart of a specific class of worldly stages. The answer to this question cannot be the answer standardly given by counterparts theorists that some similarities across the relata account for their being counterparts. Concretables, in fact, hardly bear any similarity to a class of stage's. A remaining, natural option is maintaining that the counterpart relation is brute and holds primitively. But, in turn, this goes astray from how the relation is standardly conceived.[65]

All in all, I believe that the Individual-Question, while positing a challenge in itself, should not be seen as especially concerning for the friends of DW. The Individual-Question arises also in the context of the Minimal A-theory and, mutatis mutandis, also in the context of approaches to modality which adopt non-concrete concretable entities, for example, in a Williamsonian Necessitist context (2013). Furthermore, the Individual-Question can be easily seen as an instance of a more general concern which questions why one is identical to himself as opposed

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[65] Viebahn (2013: 316) makes the very same point in a different context.

to someone else. Such concern in controversial – see Glazier (2020) for a discussion of how this question can be converted into a distinctive metaphysical problem – and goes well beyond the limited framework of DW.[66] Hence, friends of DW should feel free to partially sidestep this question while exploring the implications of their view.

2.4   Temporary Necessities

Consider the following thesis:

Perpetuity: Necessary truths are always true.

Perpetuity is a principle which embeds some natural intuition on the temporal behavior of necessary truths. Necessary truths cannot be sometimes not true. If something is true as a matter of necessity, then it is always true. Perhaps surprisingly, Perpetuity has not been widely popular in philosophy until recent years. The frameworks for understanding the relation between modal and temporal logic developed by Kaplan (1989) and Fine (1977) do in fact come with violations of Perpetuity, whereby there can be necessary truths that are sometimes false. Against this received orthodoxy, Dorr & Goodman have recently developed a battery of arguments aimed at reestablishing Perpetuity as a guiding principle for understanding the temporal status of necessary truths. I believe it is not an overstatement that, thanks to Dorr & Goodman's arguments, Perpetuity is now regarded by philosophers of time as a plausible and fully rehabilitated principle.[67] Theories of time better not violate it. The question I want to tackle now is how DW relates to Perpetuity and whether it violates it or not.

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[66] Hellie (2013) is concerned with related questions.
[67] For example, Sanford Russell (2016) and Deasy (2022) express sympathy for this principle.

In order to properly address the question at stake, let us consider a view which in fact comes with apparent violations of Perpetuity. Recall the thesis which in Chapter 1 I called Moderate Temporalism. According to Moderate Temporalism, Temporalism applies only to some non-fundamental derivative truths. By contrast, Fundamental truths are always true and atemporal. Now, a natural assumption about how fundamental and derivative truths relate is that the former determine the latter:

Determination: Fundamental truths determine derivative truths.

In turn, it is natural to hold that the determination relation at stake here is a necessary relation. For example, it is natural to characterize this relation in terms of supervenience and grounding terms, which, as far as the received view goes, are in fact instances of relations which hold necessarily. Once this is granted, in a moderate temporalist setting it turns out that there are temporary necessary truths. That is because within this framework the very same atemporal set of fundamental truths determines a temporary set of derivative truths. For example, in a moderate temporalist setting, derivative temporary truths like the truth that John is sitting and the truth that John is standing will supervene on the very same set of fundamental atemporal truths like the truth that there is such and such distribution of value-fields at such and such spatiotemporal points.

By contrast to Moderate Temporalism, other temporalist theories obviously don't entail violations of Perpetuity. Consider the Moving Spotlight Theory.[68][69] Since it postulates that the fundamental property of presentness is temporarily instantiated by different spatiotemporal

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[68] See also Deasy (2022).
[69] I consider the Moving Spotlight as an example, but the point generalizes to all those theories that hold that there are temporary fundamental truths that account for temporary derivative truths.

hypersurfaces, it predicts that there are fundamental truths which are temporary. And since it postulates that the instantiation of presentness plays a role in accounting for higher order phenomena, it predicts that temporary derivative truths should be tracked back to temporary fundamental truths. This allows to maintain that there are no temporary necessities.

Moderate temporalists are free to react in many ways here, and the spectrum of their possibilities spans from dropping Perpetuity to dropping or amending Determination.[70][71] The interesting question for us is whether DW is in the same position of moderate temporalists or not. A first step for establishing this matter is considering whether DW does in fact predict that there are temporary fundamental truths.

There is a line of reasoning which does in fact support the view that DW entails that there are such temporary fundamental truths.[72] Consider a truth of the following form: 'There is an individual x and fundamental property F such that x is F'. This truth is fundamental at least insofar as it is also about a fundamental property. DW, of course, entails truths of this sort, as it commits to concretables temporary instantiating the qualitative properties of the stages involved in the sharing relations. The properties involved in the sharing relation, in fact, include

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[70] Bacon briefly discusses the issue while developing his own moderate temporalist theory. By his lights, Perpetuity is the thesis which has to be dropped. 'The way out, I think, is not to relinquish [Necessary Determination], but to allow [violations of Perpetuity]. […] The resulting view is one in which what's necessary is a temporary matter, and necessary truths can be sometimes false. The existence of temporary necessities is a prediction of the standard approach to the logic of modality and tense, developed by people like Kit Fine and David Kaplan. Although Dorr and Goodman have recently drawn attention to this somewhat surprising consequence of the standard view, and have recommended an alternative modal-tense logic, the orthodox view strikes me as the most natural way to be a [moderate temporalist] Dorr and Goodman's arguments notwithstanding' (Bacon, 2018, *footnote* 18).

[71] I find particularly tempting to amend Determination in such a way that the relation between fundamental and derivative truths is not a necessary one. A natural candidate for this relation is contingent grounding, whereby fundamental truths contingently and temporarily ground derivative turths, see Leuenbeger (2015) and Skiles (2015). Another one, recently developed by Werner (2022) is arbitrary grounding, whereby fundamental truths aribirtarily and temporarily ground derivative truths. Of course, this approach trades a controversial thesis about necessities for a controversial stance on grounding, but, still, it can provide some relief to those moderate temporalists that do in fact find Dorr & Goodman's arguments persuasive.

[72] Thanks to Daniel Deasy for suggesting this reasoning to me.

also fundamental properties. And DW entails that truths of this sort are temporary. After all this the core upshot of the temporariness of the sharing: sometimes a concretable instantiates a given set of properties (including fundamental ones) and sometimes does not.

A second line of reasoning is analogous to the first but relies on the nature of individuals instead than on the nature of properties. Consider a truth of the following form: 'There is a fundamental individual x and a property F such that x is F'. This truth is fundamental at least insofar as it is also about a fundamental individual. And, again, DW can entail truths of this sort, for friends of DW can in fact claim that concretables are part of the fundamental furniture of reality. As a result, there is temporariness in the fundamental individuals involved in the sharing: sometimes a fundamental individual instantiates a given set of properties and sometimes does not. Of course, this strategy, in contrast with the first, requires the adoption of a peculiar stance on the philosophy of individuals: that individuals are fundamental.[73] But, overall, this stance on individuals is not controversial to the extent of being unviable and it coheres well with the principled view that there is a salient distinction to be made between qualitative and non-qualitative truths – which is a basic assumption for DW.

I shall not explore these lines of reasoning further, although I recognize that much more could be said about them and about the relation between time and modality. However, I take it that these arguments provide good *prima facie* evidence that within DW there are some temporary fundamental truths about the properties instantiated by concretables.

Now, granted that within DW that are truths of this sort, it is established that DW does not count as a moderate temporalist theory. At this point, what remains to be fully clarified is

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[73] See, e.g. Dasgupta (2009) for arguments against this view and for assessment.

whether DW entails violations of Perpetuity. It should be straightforward to see that it does not. The *only* temporary truths entailed by DW are truths about the properties instantiated by concretables via the sharing relation.[74] And those truths have the exact form of the truths just seen above, e.g. 'There is an individual x and a property F such that x is F'. It can be, of course, that concretables temporarily instantiate properties which are not fundamental, e.g. the property of sitting. But, in turn, the truths about the instantiation of these non-fundamental properties are to be tracked back to truths about the instantiation of fundamental properties, e.g. truths about sitting track back to truths about possessing a given set of properties described by physics. On this picture, temporary fundamental truths necessarily determine temporary derivative truths. Hence, there are no temporary necessities and Perpetuity is respected.

2.5   Epistemic Hazards[75]

Let's now turn to the relation between DW and epistemology. Some introduction to how A-theories and epistemology relate is needed. I provide such introduction in the present section and then I move on considering the specific case of DW.

An *Epistemic Objection* applies to some A-theories.[76] The Epistemic Objection, in a nutshell, is concerned with the belief that one inhabits the present time. By way of elucidation, let's assume the Moving Spotlight Theory in the background.[77] The Moving Spotlight Theory seems

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[74] How about 'meta-truths' of the form 'Property F is shared between stage s and concretable x'? Notably, also these truths involve fundamental properties as well as (possibly) fundamental individuals. Thus, they are no exception to the reasoning exposed in the main text. It is indeed (fundamental) truths about sharing which underly change in the nature of the concretables and so the passage of time within DW. Same goes for truths involving time-shifts, like 'Property F used to be (will be) shared between s and x *n* time units ago'.

[75] Part of the two next sections reworks a section of Tullio & Soriani (2024). Thanks to Tommaso Soriani for discussion here and for allowing me to adapt part of the material.

[76] The objection tracks back to Bourne (2003) and Braddon-Mitchell (2004). Sanford Russel (2016), Miller (2017) and Deasy & Tallant (2021) elaborate on the objection further and consider different ways of phrasing it in a rigorous argument.

[77] I do this because I am here interested in Permanentist Temporalism, but the Growing Block Theory would do as well (early instances of the objection were addressed to the Growing Block in fact).

to come with the implication that there are non-present believers. That is, entities which in fact classify as believers and which don't inhabit the present time (where a time is identified with a spatiotemporal hypersurface). The presence of non-present believers comes with puzzling epistemic implications. The set of beliefs held by a non-present believer plausibly includes the belief of inhabiting the present time. Yet a non-present believer does not inhabit the present time. Hence, a non-present believer holds wrong beliefs as to whether it inhabits the present time or not. Caesar, for example, now falsely believes that a time before Christ is indeed the present. The Moving Spotlight Theory standardly holds that it is a merely temporary matter that present-believers have their belief that they inhabit the present time correctly: as time passes (and there is a change in which hypersurface is the present one), a believers' belief will be false.

As many have observed, granted these background assumptions, it becomes puzzling how present believers can *know* that they inhabit the present time. After all, there seems to be nothing that draws a thick enough line between the epistemic situation of a present believer and its non-present counterparts. For example, there seems to be nothing in my own epistemic situation which differentiates it from a situation where I don't inhabit the present time: in both situations I believe that I inhabit the present time and I have experiences as of drafting a chapter, for example. Hence how can I know that I do in fact exist at the present time? What does grant me that I am not on the same boat with Caesar and non-present believers? My own beliefs about the present time seem in fact epistemically hazardous.

This train of thought possess a great deal of traction. Intuitively, it applies to any theory postulating non-present believers, including most notably the Moving Spotlight and the Growing Block (the only difference being that the former has room for future non-present

believers instead than for only past ones). However, as convincingly argued by Miller (2015) and Sanford Russell, (2016) this reasoning proved to be resistant to being converted into a full-fledged objection. It turns out to be particularly hard to find some plausible epistemological principle which is in fact not satisfied by the belief that one inhabits the present time.

Consensus has been reached that the best way to articulate the objection is by appealing to an externalist Safety Principle for knowledge, which goes as follows:[78]

> **Safety:** If a subject knows that P, then there is no subject close to P which believes that P and P is false.

Safety is designed to capture the concept that beliefs qualify as knowledge only if they couldn't easily have been false, as articulated by Williamson: 'If one knows, one could not easily have been wrong in a similar case' (2000, p. 147).

The notion of closeness at stake in Safety is externalist in spirit; it has to do with the environment surrounding a subject. Subject sharing an environment which is similar, say, in metaphysical terms, will plausibly count as close in the relevant sense. As J. S. Russell puts it:

> The idea is that a close belief has a sufficiently similar basis to yours. This is rough, and it may well be impossible to elucidate closeness without eventually appealing back to knowledge. But we can still make good judgments in lots of cases. 'Basis' is used in an extended sense: a belief 's basis isn't generally 'in the head'. Possible believers in

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[78] See, inter alia, Sosa (1999), Williamson (2002), and Pritchard (2008) and (2009) for more on Safety.

situations with importantly different environments, or causal laws, or underlying metaphysics, typically don't count as close. (2016: 156)

One epistemological benefit coming with the adoption of Safety is, for example, that Skeptical threats are eluded: with any plausibility my own belief that I have hands is safe in that entities like envatted brains are not close to me.

Granted Safety, the Epistemic Objection can be formulated as follows – where P is equivalent to the proposition that one inhabits the present time.

(1) If I know that P, then necessarily if anyone close to me believes that P, then P.

(2) My belief that P is close to itself.

(3) If someone closely believes that P, then it will always be the case that he closely believes that P.

(4) It won't always be the case that the belief that P is true.

(5) It won't always be the case that if anyone closely believes that P then, P.

(6) If something is necessarily the case, then it is always the case.

(7) Therefore, I don't know that P.

Few remarks on each premise. (1) just elucidates the Safety principle. (2) states a very natural implication of the notion of closeness. (3) states that the property of closely believing is permanent: if one has it, then she always has it. (4) is an implication of any temporalist theory A-theory. (5) follows from (1) and (4). (6) is an instance of the plausible Perpetuity principle discussed at the end of the last Section.

As mentioned above, the core target of the Epistemic Objection are the Moving Spotlight Theory and the Growing Block Theory. There are two main ways out from the objection on behalf of the Moving Spotlight and the Growing Block theory. Both replies are concerned with rejecting premise (3).

The first way out is denying that there are non-present believers altogether. Recall the distinction made in Chapter 1 between Pure and Impure versions of Permanentism. Premise (3) can be denied by adopting an Impure version of Permanentism where things don't possess permanently their qualitative profiles. In particular, one can hold that things which inhabit past and future hypersurfaces cannot qualify as believers for they lack the qualitative profile which underlies the possession of beliefs. In this setting, one should think of entities like Caesar as entities which currently don't have (nor can in principle have) any belief. The property of being a believer should be seen as a temporary property, which entities sometimes have and sometimes don't have.[79] This strategy is tied together with a specific stance on the relation between consciousness and the present hypersurface. In particular, this strategy is naturally married (and arguably entails) the view that only the present hypersurface provides the necessary and sufficient grounds for there being any consciousness.[80]

A natural concern about this reply is that it seems untenable to assume that consciousness should be confined to the present hypersurface, at last as far as the standard accounts go. Let's focus again on the Moving Spotlight. Let's say that reality is a four-dimensional manifold comprising a vast array spatiotemporal hypersurface. Those hypersurfaces are just alike

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[79] The insight of this strategy tracks back to Forrest (2004). The strategy is further developed in different versions by Forbes (2015) and Deasy (2015, 2022).

[80] This strategy can be more particularly developed by endorsing Deasy's (2015, 2022) About Presentness principle – which we briefly touched upon in Chapter 1. However, as argued in Deasy & Tallant (2022), About Presentness is subject to a number of criticisms, including (some versions of) those discussed below.

physically speaking, but one of them instantiates the special property of presentness. Now, why should one assume that presentness plays a special role in bringing consciousness about? An assumption vastly accepted in the metaphysics of consciousness is that consciousness does in fact depend on the physical.[81] Physical correlates bring consciousness about. The reply at stake is at odds with this assumption. Friends of this reply should endorse a view according to which consciousness depends on the physical correlates described by science *and* on the special property of presentness. It is not clear how this move could be motivated. Surely Caesar, even when not located at the present hypersurface, still instantiates those physical properties which are ordinarily taken to bring his consciousness about. Friends of the approach are free to insist that the ordinary stance on the correlates of consciousness is wrong as it does not countenance the property of presentness. But, notably, they have no apparent reason for endorsing this view other than their need of eluding the Epistemic Objection. Hence, their reply is vulnerable to the objection of being ad hoc.

A second concern about this strategy is that it leads to a grim picture of reality. If it is granted that only the present hypersurface has room for consciousness, one runs into a picture of reality where the vast majority of spatiotemporal hypersurfaces host *zombies* – entities which are functional duplicates of conscious agents, but which nonetheless lack consciousness. This implication alone might suffice to discourage one from endorsing the reply at stake.[82]

The second way out is denying that there are close non-present believers, as suggested by Cameron (2015).[83] By contrast to the first reply described above, this strategy allows to

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[81] Of course, though, there is disagreement on whether consciousness is in fact fully reducible to the physical or whether it is indeed a fundamental constituent of reality.

[82] Zimmerman (2008) and Skow (2015) share this feeling and so do I.

[83] Cameron recommends this strategy to friends of a standard Moving Spotlight, but does not need it for his own peculiar version of the theory (which basically rejects that non-present entities are concrete).

maintain that non-present hypersurfaces in fact host conscious believers. What this strategy denies – again against premise (3) – is that non-present believers are *close* to present believers. In Cameron's view, there is a crucial metaphysical divide between present and the non-present believers: while the former believers are located at a hypersurface which instantiates the property of presentness, the latter don't. And this divide, the strategy goes, makes for a failure of the similarity in the believers' environment which results in a failure of closeness.

At first, this second reply perhaps looks more intriguing than the first one, insofar as it does not require neither postulating a sinister correlation between consciousness and presentness, nor the acceptance of zombie times. But it faces powerful concerns. As J. S. Russell (2016: Section 5) convincingly argues this reply comes with a tendentious tackle on closeness. Why should the fundamental property of presentness make any relevant difference for our beliefs? After all, in this setting a present and a non-present believer's environment are identical under any respect with the sole exception of the instantiation of presentness. A possible rejoinder might go as follows: presentness plays a role with respect to closeness for it plays a role in the very possession of the beliefs at stake; without presentness there can be no beliefs at all. But this rejoinder is obviously untenable for Cameron's strategy is exactly intended to secure that there are non-present believers which do in fact have beliefs. A friend of this strategy is tied with the tendentious assumptions that (i) presentness is not necessary for having consciousness and beliefs and (ii) presentness plays a role relevant to closeness.

I shall not pursue this discussion further. What should be clear is that the Epistemic Objection is a dangerous objection for those views that postulate that there are non-present believers.

2.6   The Epistemic Objection in a Disclosing Window Setting

So, how does DW relate to the Epistemic Objection? In a sense, DW seems a natural target for the objection, as it maintains that there are believers distributed across all hypersurfaces: in DW's setting Ceasar is as much a believer as me. At a closer inspection, however, it is not clear how the Epistemic Objection could possibly apply to DW, as DW identifies times not with physical hypersurface but rather with instant propositions. In a way, it is even hard to see how the belief that one inhabits the present time has to be specifically understood in DW's setting. Furthermore, it is hard to see what could possibly classify as a non-present believer, for presentness is again a property of propositions, rather than a property of hypersurfaces and believers.

These preliminary considerations are confirmed once one looks at the objection more closely. Consider again the Epistemic Objection. As stated above, the objection is about the belief of inhabiting the present hypersurface. DW has not room for this and thus it is not viable to run a version of the objection built around such belief. However, it can be conceived that some instance of the objection applies to other beliefs as well. Actually, what one needs to put the Epistemic Objection to work is singling out a belief which makes the premises of the argument true. A way to test DW's vulnerability to the objection is checking out whether within DW there is any belief of such sort. The first requisite of any such belief, of course, is that of being temporarily true. Now, within DW, what's temporary is the sharing of qualitative profiles between stages and concretables. So, the belief to be tested is the belief that one has a given qualitative profile. Call this belief P. This kind of beliefs is widespread. I do have beliefs similar to P: I currently believe, for example, that I am having a qualitative profile which includes the property of sitting and drafting a chapter.

It should be clear that the objection cannot be appropriately built around this kind of belief. To see this, consider again my belief that I am sitting. Within DW, this belief does not satisfy premise (3). In contrast to what stated by premise (3), in fact, within DW I only temporarily possess this belief: I have this belief only as long as I stand in a sharing relation with a stage that has such belief (and the associate qualitative profile) in the first place. So it won't always be the case that I believe that P. Faced with this, one can insist that, within DW, there still is a sense in which someone will always believe that P. After all, there are stages. And, as stated clearly while introducing the view, stages always instantiate their qualitative profiles. Thus, stages satisfy premise (3). This is all true but does not allow a formulation of the objection. That's because, stages' belief fail to satisfy premise (4). A stage's belief is always true for it is always true that a stage instantiates its own qualitative profile. So it is not the case that it won't be the case that a stage's belief is always true.

At this point, it might seem that there is not so much bite left for epistemic concerns within DW. However, I believe there is, in fact, a version of the Epistemic Objection which can be raised against DW. Such version of the objection is built around one specific belief: the belief that one is a person as opposed to a stage. The core idea is that, within DW, one cannot know that he is in fact a person. This version of the objection is supported by the following insight: within DW there are both concretables and stages. When the sharing obtains, concretables instantiate the properties of those stages involved in the relevant sharing relation. So, for example, now I am instantiating the properties of a stage which is drafting a chapter of the present dissertation. Me and this stage are having the very same experiences and possess the very same spatiotemporal location. How do I know that I am a concretable which instantiates properties thanks to the sharing relation rather than a stage?

In a way friends of DW are in the same position of those who endorse a perdurantist account of persistence and describe persons as mereological aggregates of instantaneous stages. They must account for how the presence of stage does not turn out to be epistemically nefarious.[84] I do believe that the case of DW and the case of perdurantism are very much analogous indeed, and I submit that the dialectical resources available to DW are in fact the same which are available to perdurantists. Fortunately, some arguments on behalf of the epistemic position of perdurantist view have been recently developed in Tullio & Soriani (2024). The discussion to follow below applies parts of these arguments to the case of DW.

So, let's go back to the objection and the belief that one is a person as opposed to a stage. A version of the objection targeting this specific belief can be again articulated by appealing to a Safety principle. The result is a distinctive *Epistemic Objection Against DW*, which goes as follows:

(1) If I know that I am a person, then, necessarily if anyone close to me believes that he is a person, then he is a person.

(2) There is someone which is close to me that believes that he is a person and he is not a person: the stage that presently stand in the sharing relation with me.

(3) Therefore, I don't know that I am a person.

Of course, friends of DW should focus on premise (2) and contend that there is something wrong with it. In the following, I shall show that there is at least one viable way to reject (2) and secure DW solid epistemic grounds.

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[84] See, e.g., Zimmerman (2003: 502) for a presentation of the epistemic concerns applying to perdurantism.

So, let us consider the conjunction of the following two theses:

Identity Assumption: According to the Disclosing Window it is a metaphysical truth that persons are identical to concretables that stand in the sharing relation with stages rather than being identical to stages.

Necessitism: Metaphysical truths are necessarily true.

The Identity Assumption merely articulates a fundamental tenet of the Disclosing Window. Necessitism, on the other hand, represents a prevalent perspective regarding the nature of metaphysical truths. When these two principles are taken together, they lead to the conclusion that there is no close scenario where a person is identical to a stage. The reason is that there is no scenario *at all* where such an entity is identical to a stage. To advance the objection, those who challenge DW must disavow the view that metaphysical truths, such as the Identity Assumption, are necessarily true. They must also concede the existence of possible worlds where persons are identical to a stage rather than to a concretable standing in the sharing relation. This requires rejecting Necessitism, which, despite facing some recent challenges in certain contexts—see, for example, Miller (2020)—remains a widely held view. Friends of DW are obviously free to not follow the objectors in assuming this stance. And, it's bad news for the objectors if things boil down to a disagreement on the status of metaphysical truths.

As a result, the Epistemic Objection Against DW, despite being *prima facie* attractive, doesn't withstand scrutiny and fails to present a genuine challenge to the Disclosing Window. In fact, the belief that one is a person is safe, as there are no believers close to persons who incorrectly believe that they are persons. This is an important result, as it frees friends of DW from the

need of endorsing strategies akin those that other temporalists must endorse in order to secure to their view solid epistemic grounds. Friends of DW neither have to subscribe to the sinister claim that there are zombie hypersurfaces, nor they have to endorse a tendentious stance on what it is to be close in the sense at stake in Safety.

Chapter 3   Arguments from Spacetime Physics

In this chapter, I introduce the essential components of spacetime physics and then I discuss how they affect temporal metaphysics. First, I offer some introductory remarks on the notions of space and time. Then I describe the essential pictures that come with Pre-Relativistic and Relativist Spacetimes. Finally, I discuss the Objection from Spacetime which is raised against A-theories.

3.1   Preliminaries: Space and Time

Let me start with a preliminary clarification. I said earlier that times can be either identified with physical things or with non-physical things, depending on which of Physical and Non-Physical Times is endorsed. And I have shown that DW does in fact endorse Non-Physical Times by identifying times with Instant Propositions. In the next subsections, while describing Separatism and Unitism and Neo-Newtonian and Relativistic Spacetimes, I shall not take this distinction into account and I will omit some related terminological difficulties accordingly. In speaking of times I will refer to things which can be in principle identified with physical entities, being them fundamental or derivative from a more fundamental spatiotemporal reality. I shall clarify in due course how this relates to DW's adhesion to Non-Physical Times.

So, let's consider two fundamental questions right away: what is space? And what is time?[85]

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[85] For excellent and systematic answers to these questions and for a presentation of the topics exposed below, see, inter alia, Dainton (2001) and Maudlin (2012). Skow (2015, ch. 1) provides an excellent introduction. See also Costa, Calosi, Gilmore (2016).

Of course, these questions have a long and venerable philosophical history. Some in fact believe that there is something wrong with how I phrased them. Very roughly, *Relationists* about space and time deny that space and time do in fact exist and analyze spatial and temporal relations in terms of the entities involved in those relations. Relationists will thus dislike questions which do in fact presuppose the existence of space and time at the outset. *Substantivalists*, on the other hand, won't share such concerns, as they are happy with an ontology that includes space and time. I shall here presuppose a substantivalist stance and take these questions seriously accordingly. Setting the Relationism/Substantivalism debate aside, there are two fundamental stances on these questions.

First, *Separatism*. According to Separatism, there is space and space is three-dimensional. Space is made of un-extended points which stand in spatial relations each other. Spatial regions are collections of these points. Space in itself is the maximal collection of these points. Then, there is time and time is one-dimensional. Time is made of instantaneous instants which stand in temporal relations each other. Intervals of time are (appropriately chosen) collections of instants. Finally, space and time are equally fundamental and separate: there are no points shared between space and time. Notably, points of space persist through time: any given point of space exists at least one instant of time.

Second, *Unitism*. According to Unitism there is a certain kind of entity called spacetime. Spacetime has three spatial dimensions and one temporal dimension. Thus, spacetime is four-dimensional. A spacetime is made of unextended and durationless spacetime points which stand in distance relations each other and which thus constitute a manifold: a spacetime's structure can be described geometrically. Unitism does not predict that there are points of space and points of time but is consistent with it. What Unitism predicts, though, is that, if there are points

of space and time, then they are things which do in fact share points one another. An instant of time is identified with a maximal collection of spacetime points each of which is simultaneous with the other. A point of space is identified with a maximal collection of spacetime points which are all at zero spatial distance from each other.

Separatism is sometimes described as the view which is more friendly to commonsense and pretheoretical intuitions. There are, in fact, also substantial philosophical reasons that support Separatism. Separatism is friendly to any philosopher willing to claim that there are things which do in fact exist in time without existing in space and to any philosophers willing to claim that there is in fact a salient difference in how things exist in time and in how they are located in space.[86] Thus, Separatism deserves serious philosophical consideration and its dismissal should not be seen as something readily accepted. However, nowadays Unitism is more popular. A crucial reason for this is that eminent scientific theories, such as Special Relativity Theory, are at the very least easier to formulate once Unitism is presupposed. As a matter of fact, Separatists face the burden of showing that their view is in fact fully compatible with Special Relativity (and with physics more generally).

This being said, I shall here say nothing more about this dispute and in what follows I shall assume Unitism. There are two main reasons for this. First DW is very much compatible with a unitist stance, as it does not rely in the distinctions standardly at stake in separatist theories. Second, the assumption of Unitism serves well the dialectical purpose of this chapter and the next. Since I want to show that DW is immune to the Objection from Spacetime and since the Objection from Spacetime assumes Unitism, I better assume Unitism as well.

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[86] Instances of such views are some endurantist theories of persistence, such as Costa's (2017) Transcendentism.

3.2 Pre-Relativistic and Relativistic Spacetimes

Unitism has it that reality is spatiotemporal. But there are different ways in which reality could be spatiotemporal. I shall here describe the highlights of two of them which have a crucial bearing on temporal metaphysics.

Let's begin with Pre-Relativistic Spacetimes, that is, with models of Spacetime which used to be the standard before the appearing of Einstein's Special Relativity Theory and Minkowski's formalism. A standard distinction is made between Newtonian and Neo-Newtonian Spacetime. Within a Newtonian Spacetime, there are absolute facts about (i) the spatial distance between any two spacetime points at a given time, (ii) the temporal distance between any two spacetime points, and (iii) the spatial distance between any two spacetime points at any given time. A Newtonian Spacetime exhibits little room for perspectival flexibility. For example, it requires that there be well defined and absolute notions of rest and sameness of place across time. And these are rather unfortunate commitments, since, for example, it is not compatible with Newton's own physics and with a Galileian principle of relativity. A Neo-Newtonian (or Galileian) Spacetime, in a nutshell, dispenses from this sort of commitments. In particular, A Neo-Newtonian Spacetime retains (i) and (ii) but rejects (iii). In this setting, there is no fact of the matter as to whether a given observer is at rest or in motion: there is no more any well-defined notion of absolute rest. Rather, in a Neo-Newtonian Spacetime there is room for perspectival components which deliver perspectives on the same geometrical structure.

Yet, there is something that both Newtonian and Neo-Newtonian Spacetimes agree about and which makes these kinds of Spacetime distinctively Pre-Relativistic. Both Newtonian and Neo-Newtonian admit is an absolute sense in which Spacetime can be divided into three-

dimensional hyperplanes or spatiotemporal hypersurfaces. These hyperplanes are thought to contain those points which are simultaneous each other.

Borrowing from Skow's (2015) formulation, here is a definition of Pre-Relativistic hyperplane.

Pre-Relativistic Hyperplane: spacetime region R is a Hyperplane of Simultaneity iff every point in R is at zero temporal distance from every other point in R, and every point at zero temporal distance from a point in R is (already) in R.

Relatedly, within a Pre-Relativistic Spacetime there is an absolute way of defying points of space. Here's a definition of what counts as a point of space in a Pre-Relativist Spacetime:

Pre-Relativistic Spatial Point: Spacetime region R is a point of space iff every point in R is at zero spatial distance from every other point in R, and every point at zero spatial distance from a point in R is (already) in R.

Notably, these definitions rely on the notions of temporal and spatial distance. A crucial feature of Pre-Relativistic Spacetimes is that these distances are physical entities which do in fact possess absolute values.

One useful way to think about a Pre-Relativistic Spacetimes is as a manifold of points out of which only one given series of parallel hypersurfaces could be singled out – the series which appropriately identifies the simultaneity relations obtaining among spacetime points. In other words, within a Pre-Relativistic Spacetime there is a unique and objective and frame-independent *foliation* of Spacetime into hyperplanes.

Foliation Absoluteness: There is an Absolute Foliation of Spacetime into hypersurfaces.

This results into a picture where Spacetime has the Pre-Relativistic structure illustrated by Figure 1.

Hypersurface ⟶ ... ⟵ Point of Space
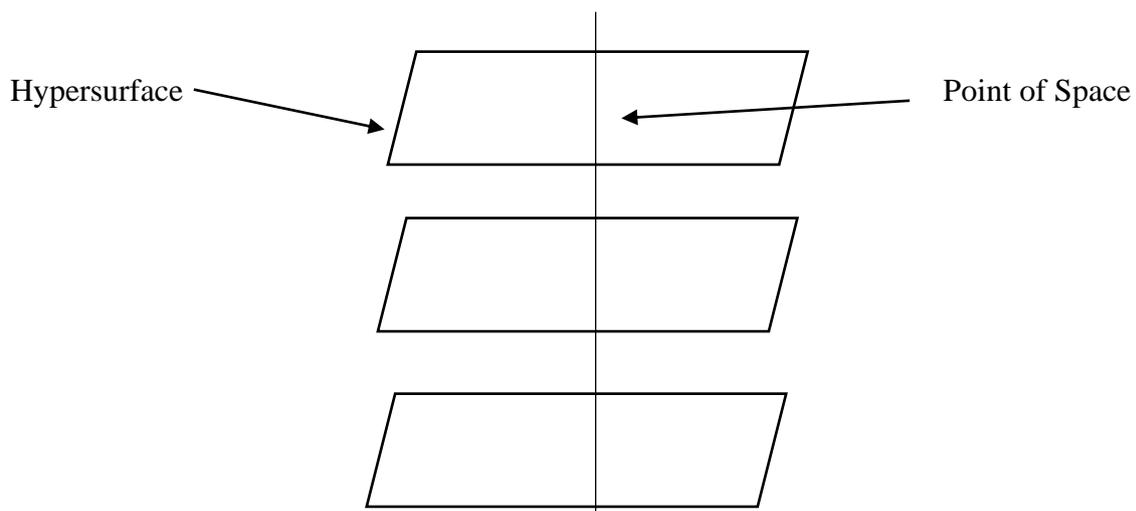
Figure 1: Pre-Relativistic Spacetime

Notably, Pre-Relativist Physics, while providing spacetime of a privileged foliation, does not single out any distinction among hypersurfaces. In a Pre-Relativistic spacetime all hypersurfaces are on par, at least as far as the physics is concerned. Thus, in a Pre-Relativistic Spacetime Hypersurface Egalitarianism is true.

Hypersurface Egalitarianism: There is no distinguished hypersurface: all hypersurfaces are on a par.

Having room for an absolute foliation doesn't mean that a theory has room for a distinguished hypersurface.

The Pre-Relativistic picture has been twisted by Einstein's Special Relativity Theory (SRT) and by Minkowski's Spacetime. Minkowski's Spacetime offers elegant mathematical tools for interpreting the results of SRT and, albeit perhaps not necessitated by SRT[87] it is standardly assumed, by philosophers and physicists alike, to come naturally with the theory. I shall not attempt to reconstruct to Einstein's SRT here, but rather introduce the core implications that SRT has on our basic understanding of space and time.

The core facts about Minkowski Spacetime can be elucidated in contrast with Pre-Relativistic Spacetime. Temporal and Spatial distances no longer are the basic geometrical and physical components of Minkowski Spacetime. Rather, the basic component is the *spatiotemporal interval* between two points.[88] In this picture, for any given spacetime point, there are some sensible distinctions to be made about how such point relates to the others. In particular, relative to a spacetime point a there is (i) a class of points such that could be reached from a by a signal travelling at or below the speed of light, (ii) a class of points such that a could be reached from them by a signal travelling at or below the speed of light, and (iii) a class of points such that they cannot be reached by a (nor can reach a) by any signal travelling at or below the speed of light. These three classes are standardly classified as a's absolute future, a's absolute past, and a's spacelike separated points (or 'absolute elsewhere').

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[87] This is what Separatists about Space and Time should claim and usually do.

[88] The spatiotemporal interval between two points can be positive, negative and equal to zero, and this marks a difference between temporal and spatial distance, for temporal and spatial distance could be either positive or equal to zero, but not negative.
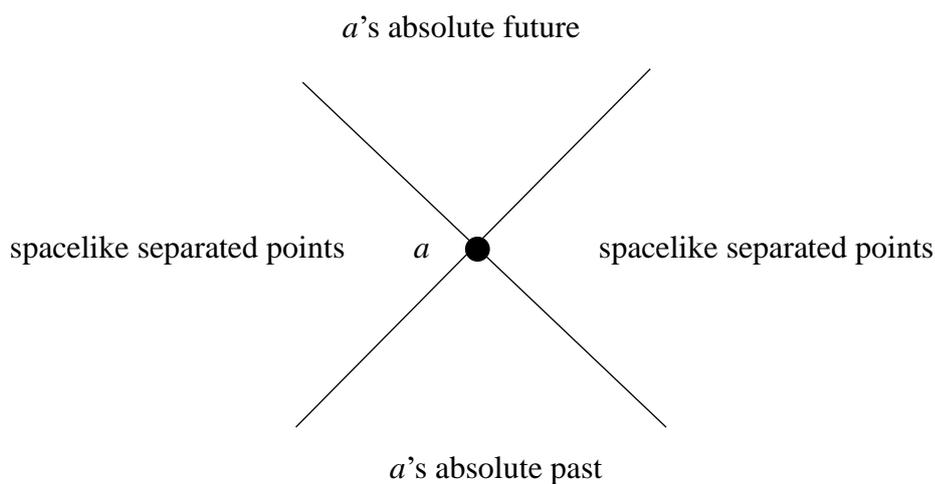
a's absolute future

spacelike separated points   *a* ●   spacelike separated points

a's absolute past

Figure 2: Minkowski's Spacetime Structure

This being said, the crucial feature of Minkowski's spacetime is that simultaneity across spacetime point is not an absolute well-defined relation. Simultaneity in Minkowski spacetime is just analogous to what absolute rest is in a Neo-Newtonian spacetime. There is, however, room for a relative notion of simultaneity. Consider an inertial observer S (an observer which moves with an unaccelerated velocity). The worldline of such observer S determines a frame of reference. At each point within such worldline a light signal is sent out. Consider again point *a*. From point *a* a signal is sent out. Such signal then reaches point *b*, which is outside the original worldline. The signal is then sent back on point *c*, which is on the original worldline. According to a frame-relative understanding of simultaneity, point *b* will be simultaneous with the point which is in between point *a* and point *c* – call it point *x*. In S's frame of reference, *b* is simultaneous with *x* and can be meaningfully said to be part of the same spatiotemporal hypersurface.
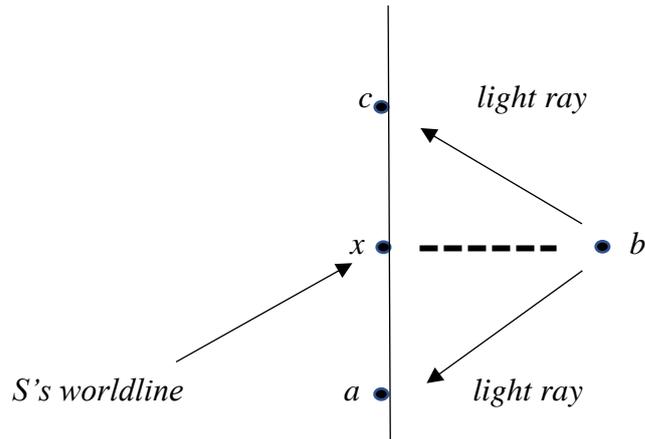
Figure 3: Frame-Relative Simultaneity

This understanding of simultaneity is frame-relative in the sense that facts about simultaneity can be established only with reference to a specific reference frame as opposed to absolutely. Thus a question like 'Is point *a* simultaneous with point *b*?' is no more meaningful than a question like 'Is point *a* on the left?'. In order to properly tackle these questions one needs to fill them with an additional missing parameter – a reference frame and a perspectival parameter. To appreciate this further, consider another inertial observer R numerically distinct from S. Say that R and S coincide in spacetime point *a*. Now, provided the frame-relative understanding of simultaneity illustrated above, it turns out that R's and S's will deliver contrasting judgements on which points are simultaneous with a. For example, consider a spacetime point *p* spacelike separated from *a*. It can be the case that in S's frame *p* is simultaneous with *a* and that in R's frame *p* is not simultaneous with *a* but rather later than *a*. Thus, statements about simultaneity must specify which frame of reference is assumed in the background.

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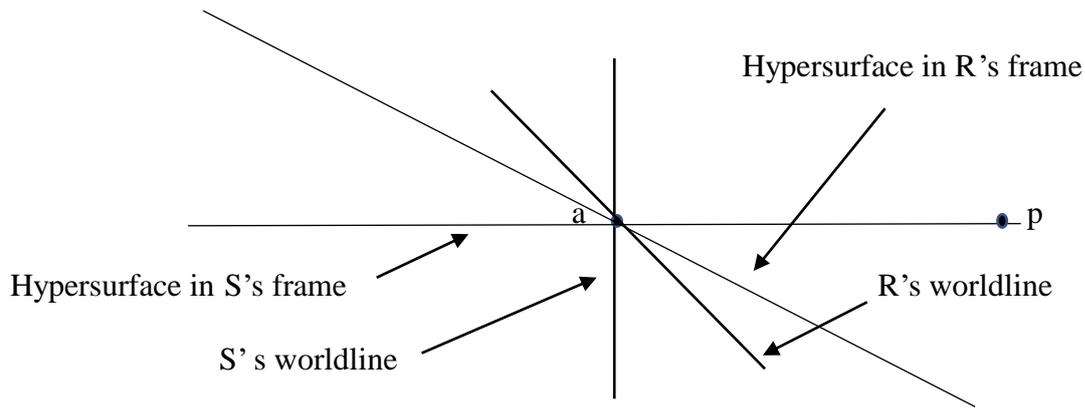
Figure 4: Simultaneity in different frames

As a result, there is no absolute foliation of spacetime into hypersurfaces.

> **Foliation Relativity:** There is no absolute, frame-independent foliation of spacetime into hypersurfaces.

Foliations are frame-dependent and different frames of reference will deliver different ways of partitioning spacetime into hypersurfaces. Not only in a Relativistic spacetime there is room for a metaphysically distinguished hypersurface. There is also no room for an absolute foliation of spacetime into hypersurfaces.

3.3   The Objection from Spacetime

Spacetime physics provides the grounds for mounting an objection against temporalist A-theories: the Objection from Spacetime. The Objection from Spacetime generalizes over two different arguments, the Argument from Relativistic Spacetime and the Argument from Pre-Relativistic Spacetime. The Argument from Relativistic Spacetime is well-known and has been long discussed in the philosophy of time. Something which is sometimes overlooked is that

there is also an Argument from Pre-Relativistic Spacetime which is very naturally coupled with the Argument from Relativistic Spacetime. I review each of these arguments below.

For ease of exposition, let's begin with *The Argument from Relativistic Spacetime*:

(1) There is no absolute foliation of Spacetime into Hypersurfaces.

(2) If (1), then there cannot be a metaphysically distinguished hypersurface.

(3) If (2), then no A-theory postulating that there is a metaphysically distinguished hypersurface can be true.

(4) No A-theory postulating that there is a metaphysically distinguished hypersurface can be true.

Premise (1) is supported by Minkowski's spacetime and by STR. Premise (2) states something very plausible: the postulation that there is a metaphysically distinguished hypersurface requires the presence of an absolute foliation. Otherwise, untenable consequences arise. First it would be just hard to individuate good candidates for playing the role of the distinguished hypersurface. Second, claims to the effect that the metaphysical distinction of a given hypersurface are true simpliciter are hardly coupled with the view that hypersurfaces are merely frame-relative. (3) then follows. And (4) concludes.

There are all sorts of ways to react to this argument (or to arguments in the spirit of it), which I won't cover in detail here.[89] However for our purposes it is important to mention one such reaction. Some argue against premise (1) by contending that, even once Minkowski spacetime and SRT are taken into account, one should not concede that there is no privileged foliation. The thought is that SRT in itself does not predict that there is no privileged foliation, but rather simply does not entail that there is one. While SRT does not entail that there is a privileged foliation, it is *compatible* with the postulation of such foliation. In other words, SRT can be supplemented with an absolute way of singling hypersurfaces out of Minkowski spacetime. Zimmerman (2011) develops a thoughtful strategy of this sort. The resulting picture is a spacetime which is in fact compatible with SRT but which takes a step further and postulates something which the physics itself does not detect.

This style of response is subject to fierce criticism. Indeed, the original Argument from Relativistic Spacetime is usually implemented by the following argument, which can be dubbed *Sub-Argument from Relativistic Spacetime*:

(1) Postulating a privileged foliation is not needed for Relativistic Physics.

(2) If (1), then no privileged foliation should be postulated.

(3) If there is no privileged foliation, then no A-theory postulating that there is a metaphysically distinguished hypersurface can be true.

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[89] See Costa, Calosi, Gilmore (2016) for a useful summary.

(4) No A-theory postulating that there is a metaphysically distinguished hypersurface can be true.

The crucial premise of this sub-argument is premise (2). (2) is about Minkowski spacetime but stems from a more general stance on how physics and philosophy should interact, call it Modesty:

Modesty: Physics should not be supplemented on mere philosophical grounds.

Sider and Dorr provide two exemplar instances of Modesty:

[…] my assessment is that the strongest reasons for resisting the Supplemented Manifold theory are independent of relativity. They are simply the general reasons for being suspicious whenever philosophers look at some beautiful, austere account of the fundamental structure of the world and tell us it must be incomplete, on the grounds that it doesn't provide what philosophical reflection has revealed to be the necessary conditions for the obtaining of some familiar facts. Attempts to draw conclusions of that sort from philosophical reflection have a terrible track record. Modesty is called for. (Dorr, *Counterparts*, ch. 2)

Perhaps future empirical research will bear out this position, but in cases of science versus metaphysics, historically the smart money has been on science (Sider, 2001: 36)

As we shall see soon, there are reasons for doubting the motivations adduced for Modesty. For now, let's observe that Modesty is a strong principle. Not only it supports the Sub-argument from Relativist Spacetime, but also an argument from Pre-Relativistic Spacetime.

In fact, with Modesty in place it becomes very natural (in a way even obligatory) to think that the methodological assumption that holds with respect to postulating a privileged foliation holds also with respect to postulating a metaphysically special hypersurface. This results in the following *Pre-Relativistic Argument*:

(1) Postulating a distinguished hypersurface is not needed for Pre-Relativistic Physics.

(2) If (1), then no metaphysically distinguished hypersurface should be postulated.

(3) If there is no metaphysically distinguished hypersurface, then no A-theory postulating that there is a metaphysically distinguished hypersurface can be true.

(4) No A-theory postulating that there is a metaphysically distinguished hypersurface can be true.

As noted above, (1) is motivated by the fact that Pre-Relativistic spacetimes don't single out a given hypersurface as in some way distinguished from the others. (2) then is a natural instance of Modesty. And the other premises are familiar. The presence of an argument against A-theories based on Pre-Relativistic spacetime has been payed less attention than arguments based on Relativistic spacetime. A somewhat common assumption is that A-theories' most concerning troubles started with SRT and Minkowski spacetime. However, that is not the case

for the train of thought that supports the Argument from Relativistic Spacetime, as just seen, also supports an Argument from Pre-Relativistic Spacetime. There is a clear sense then in which SRT and Minkowski spacetime are not necessary for making the relation between A-theories and spacetime physics troubled.[90]

Thus, there are two arguments from spacetime against theories that postulate that there be a metaphysically distinguished hypersurface. I think these arguments should be seen as instances of the *Objection from Spacetime*:

> (1) One should not supplement the spatiotemporal structure described by Pre-Relativistic and Relativistic Physics.

> (2) A-theories must add such structure.

> (3) A-theories should not be endorsed.

(1) is a statement of Modesty and, depending on which spacetime is taken into account, can be specified in terms of (i) postulating that a given hypersurface is special or (ii) postulating that a given foliation is privileged. (2) states something on A-theories' commitments. And (3) concludes. Note that the argument can in principle be generalized against theories which don't postulate that there is a special hypersurface or a special foliation but still entail something which goes beyond the spatiotemporal structure detected by physics.

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[90] See Zimmerman (2008: 220) for a similar point.

The clarificatory work done so far puts us in a position to address the question of how DW relates to spacetime physics and to the Objection from Spacetime in particular. Before getting at that, I wish to conclude with some remarks on the traction of the Objection from Spacetime and the dialectic revolving around it.

So let's go back to Modesty – which I take to embed the ultimate insight supporting the Objection from Spacetime and its specific instances. Is Modesty tenable? At first, Modesty seems to possess an impressive degree of traction and venerability. After all, shouldn't everyone retreat to a modest attitude once the truths revealed by science are pressed upon him? Let's consider Modesty more closely. As stated by Sider and Dorr, Modesty embeds two components. The first component might be called Austerity:

> **Austerity:** One should not supplement reality with anything beyond what described by physics because physics provides a complete description of reality.

The second component might be called Wise Money:

> **Wise Money:** Supplementing reality beyond by postulating things beyond those described by physics, while perhaps not entirely unreasonable in itself, is not recommendable for this practice just has a terrible 'record track'.

As it happens, there are some reasons for doubting both these components and Modesty altogether.

Let's start with Wise Money. As some have argued, Wise Money is subject to counterexamples. There are instances of views which, at the time when they were developed, were in some tension with physics which eventually turned out to be true (or more plausible candidates for being true). I here report those singled out by Bradley Monton (2011: 148-149):[91]

First, consider the Aristotelians versus the atomists. Aristotle's theory was the dominant theory of science, and the atomists, having little empirical evidence for their view, were arguably endorsing a metaphysical view at variance with current accepted science. We now think that the atomists' view of the universe is closer to reality. Second, consider a nineteenth-century Cartesian arguing against Newton's theory of gravity, on the basis that there is no local mechanism for gravitational influence. In the nineteenth century, the action-at-a-distance view of the gravitational force was widely accepted by physicists; the Cartesian's complaint would be viewed as a metaphysical one. But in fact, we now believe that the action-at-a-distance view of gravity is misguided, and that gravitational influence does propagate locally (specifically, at the speed of light, according to general relativity). The smart money was on the Cartesian's metaphysics, not on the nineteenth-century Newtonian science.

The underlying moral should be clear: physics is surely venerable, but not venerable to the extent that any view in tension with it has no chance to turn out to be true (or less implausible) in the long run.

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[91] See, for example, Baron & Le Bihan (2023) for arguments to the conclusion that the odds are against A-theories in the case of black holes (their discussion is about Presentism but can arguably be generalized). See also Wuethrich (2011) for a general and critical assessment. Builes & Impagnatiello (2025b) argue that presentism has a primacy in accommodating certain features of physical laws.

What about Austerity? Austerity surely guides the insights of a lot of people – nowadays also outside academia. However, there are plenty of instances of philosophical views which do not respect Austerity. Those views are simply those views which have room for theoretical entities which are in fact not described by physics. Indeed, there are many instances of such views, for example views which are in some way realists about normative facts, or views which reject a physicalist stance by postulating that consciousness is a fundamental component of reality, or views which account for modal notions by postulating that there are many spatiotemporally isolated concrete possible worlds. All these views violate Austerity in that they enrich reality with something that physics does not detect. Yet these views are not obviously false: their truth and relative plausibility is established by a number of philosophical considerations, not only by merely looking at whether their implications are in fact included in the recipe offered by physics. It should be clear that, as now things stand, A-theories of time are not the only, or the most natural, target of Austerity.

But perhaps it is possible to develop a version of Austerity tailored for targeting only A-theories of time. In particular, a restricted version of Austerity can be developed which does not require that physics provides a complete description of reality, but rather that physics provides a complete description of some features of reality, e.g. spatiotemporal structure.

> **Restricted Austerity:** One should not supplement spatiotemporal structure with anything beyond what described by physics because physics provides a complete description of spatiotemporal structure.

Restricted Austerity licenses views which postulate stuff that is not detected by physics as long as such stuff does not interfere with the structure of spatiotemporal reality. This strategy, of

course, turns on whether facts about consciousness, facts about morality and facts about concrete possible worlds don't count as overlapping with physics' object of inquiry in the sense at stake. *Prima facie*, facts of this sort don't have the same bearing of A-theories of spatiotemporal structure, for they are about a different subject matter. And to this extent a restricted version of Austerity suggests itself as a better building block for the Objection from Spacetime. It is this version of Austerity which gives so much traction to the Objection and this is version of Austerity I shall be concerned with while evaluating of DW relates to the Objection from Spacetime in the Chapter 4.

However, it is worth noting that there are concerns to be had also once Restricted Austerity is granted. Consider the following train of thought.

> Conscious experiences exhibits some features which are to be explained by appealing to Temporalism and the A-theoretic approach. The A-theoretic approach requires some supplementation of spacetime physics. Thus, there is some indirect support which comes from consciousness to supplementing the spatiotemporal reality described by physics.

One can refute this way of thinking at the first step, of course, by simply rejecting that Temporalism and the A-theoretic approach have any primacy when it comes to explaining experience.[92] But once the assumption that they have such primacy is granted, one has to face the fact that, in this setting, postulating additional spacetime structure is an indirect implication of some independent considerations concerning consciousness. In the present case, it seems hard to stick to Restricted Austerity without endorsing an overly stringent position on the role

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[92] So does Torrengo (2024: ch. 6).

that should be given to consciousness in establishing the plausibility of metaphysical views. Surely one would expect at least there to be debate about whether views that accomplish explanations concerning some features of consciousness *could* be true. But Restricted Austerity rules out this and prescribes an outright rejection of temporalist A-theories even when supported by facts concerning consciousness. Thus, also Restricted Austerity has some resistance to face.[93]

All in all, there are reasons for doubting the traction of the Objection from Spacetime (in both its instances). Although there might be independent motives of skepticism about it, the strategy of supplementing physics turns out not to be as much implausible and far fledged as it relatively common to assume. This being said, I shall not continue defending this strategy further in the context of DW. I am interested in defending a version of DW which does not supplement spacetime physics and thereby respects the original stance of those that are compelled by the Objection from Spacetime and by its premises. This is what I shall do in the next chapter.

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[93] I am not particularly enthusiast about strategies which do in fact refute a restricted version of Austerity on these grounds. This is not because I don't think that Temporalism has a primacy in explaining some features of conscious experience. To the contrary, I believe it does and in Chapter 5 I shall develop my best arguments for this conclusion. My lack of enthusiasm here is due to the fact that if one rejects restricted Austerity and supplements spacetime with a privileged foliation, some unwelcome complications concerning conscious experience show up. In a nutshell, these complications are due to the fact that, even if a privileged foliation is nested into a Relativistic Spacetime, surprising results arise, like the result that persons can fail to be at rest relative to the privileged foliation. Among the other things, this implies that it would be at best unclear what counts as a unified brain state at a time (given that different reference seem to be associated with different brain states). See Demarest (2025a) and (2025b) for elaboration on these points. For more on how consciousness is affected by SRT, see also Lee (2007).

Chapter 4   The Disclosing Window in Spatiotemporal Reality

In this chapter, I discuss how the Disclosing Window relates to spacetime physics and to the Objection from Spacetime. First I start with some preliminary remarks on how DW might be targeted by the Objection. Then, I argue that my theory neither requires that there be a metaphysically distinguished hypersurface nor that there be an absolute foliation. I conclude evaluating the resulting relativistic picture provided by DW, arguing that, even though at points counterintuitive, is defensible and exhibits attractions that other temporalist theories don't have.

4.1   Preliminary Remarks

DW explicitly holds that an Instant Proposition is the present one. In such a way, it explicitly commits to the view that one non-physical time is metaphysically distinguished. It is not as clear how DW relates to Hypersurface Egalitarianism and Foliation Relativity. Does DW entail that a given spatiotemporal hypersurface is metaphysically distinguished from the others or that there is an absolute foliation? DW's ideology has no room for anything like this and DW does not include any programmatic commitment to a distinguished hypersurface and to an absolute foliation in the core picture which is intended to provide. To this extent, it seems that DW seems immune to the Objection from Spacetime in a way in which its competing A-theories are not. However, one may think that DW, while not including violations of Hypersurface Egalitarianism and Foliation Relativity in its core ideology, *ends up* entailing those violations. I shall now consider this suspicion, arguing that DW does not in fact entail violations of Hypersurface Egalitarianism (Sections 4.2 – 4.5) and Foliation Relativity (4.6 - 4.7).

4.2 Sharing and Metaphysical Specialness

A natural suspicion is that the spatiotemporal hypersurface where are located the stages whose properties are shared is in some way metaphysically distinguished. In particular, some may contend that the properties which are shared with concretables are in some way metaphysically more special than the of properties which used to be/will be shared. In this section I assess various way of developing this suspicion, arguing that none of them constitutes a real threaten to DW's egalitarianism.

Let me start by considering the most natural reaction to the claim that DW respects Hypersurface Egalitarianism. An objection that I have encountered in conversation more than once can be put as follows:[94]

> Within the DW, there is a unique hypersurface h such that all of the properties (permanently) possessed by the stages located at h are such that something else (a concretable) possesses them simpliciter, and the truths about the possession of those properties by those concretables makes up a portion of the true history of the world (i.e. the present Instant Proposition). So we have what looks like an important relationship between a particular hypersurface and a particular time (the present time).

I think this kind of objection embeds two different but interlaced points.

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[94] Thanks to Daniel Deasy for suggesting this reasoning to me.

The first point is about the metaphysical interest of the sharing relation and is concerned with the fact that, within DW, while shared properties are instantiated by two kinds of entities (stages and concretables), non-shared properties are instantiated by only one (stages). This double-instantiation, the point goes, makes for a metaphysical distinction among properties. And this ultimately results in the fact that the hypersurface hosting the doubly instantiated properties is metaphysically special.

I believe this point should be rejected on the grounds that double instantiation does *not* make for any metaphysical distinction. Consider the following analogy. Say that Super-substantivalism[95] is false and the inhabitants of a spacetime region are different from the region itself (the relation between the inhabitants and such region being exact location). Say also that there is a sharing relation between (some of) the properties of a region and its inhabitant.[96] Assume also that something like the stage theory of persistence[97] is true and ordinary objects are identified with a stage with a unique spatiotemporal location. As it turns out, in this setting there are two things that instantiate simpliciter the same properties: the region and the individual stage located into it. Granted this, consider the status of empty regions within this setting – regions without inhabitants. The properties of these regions are instantiated only by the regions and not by the stages, for no stages are located at them. This is a case where double instantiation is distributed in an uneven way across spatial regions. Does the view at stake entail that regions provided with individuals are metaphysically more special than empty regions? A lot can be said about the theory I sketched, but I believe nobody would charge it with the onus of postulating a metaphysical disparity among spatial regions. This is because

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[95] Super-substantivalism is the view that there is no difference between the inhabitants of a spacetime region and the region itself. See Schaffer (2009) for a defence of this view.

[96] Most notably, shape-properties (this account is developed by some, e.g., Calosi (2021) uses it to provide a reply to the Harmony Argument developed by Schaffer (2009)).

[97] See Sider (1996).

sharing is assumed to be a relatively innocent phenomenon that brings about no metaphysical distinction whatsoever. The fact that a given set of properties has two bearers in itself does not bring about any interesting metaphysical disparity. I believe the same rationale should apply to DW. The fact that 'there is a unique hypersurface *h* such that all of the properties (permanently) possessed by the stages located at *h* are such that something else (a concretable) possesses them simpliciter' is not metaphysically more suspicious than the fact that inhabited regions in a non-super-substantivalist setting are such that all the properties possessed by them are such that something else (an inhabitant) possesses them simpliciter.

The second point, rather than about the sharing of properties in itself, is about the role that it plays in the context of DW. It can be though that shared properties are distinguished in that they make a crucial contribution in making up the true (and present) Instant Proposition. After all, it is because some properties are shared with a given concretable that now is true, for example, that I am drafting a chapter. This seems to result in a distinction among hypersurfaces: it is only the hypersurface hosting shared properties, so to speak, that has a say on what's true. And this can be well thought to suffice for such hypersurface being metaphysically distinguished in some sense that violates Hypersurface Egalitarianism.

I believe this point is misguided in that it relies on an unwarrantedly narrow conception of what it is to determine the truths included into Instant Propositions and making up a portion of the history of the world.[98] I grant that shared properties make up a portion of the true history of the

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[98] There is another way of responding to the point at stake that I don't endorse but which I want to briefly describe outside the main text. An assumption of the standard DW is that there is only one concretable that temporarily instantiates the properties of a given series of stages. For example, only the concretable Caesar temporarily instantiates the properties of a series of stages including, among the others, a crossing the Rubicon stage and a stage stabbed by Brutus. This entails that, within a given collection of stages, only one stage has its own properties shared with a concretable. This assumption can be dropped. Consider the following non-standard DW. There are many concretables, indeed much more than we would expect. Each and every stage has its own properties presently shared with one of these concretables. So, for example, both the properties of a crossing the Rubicon stage and of a stage stabbed by Brutus are shared, with two numerically distinct concretables. In the resulting

world. But so do the properties that are not shared. Recall that in the setting of DW stages *always* instantiate their properties. As a matter of fact, each and every Instant Proposition entails the same truths about the properties instantiated by stages. And those truths are determined by properties which can fail to be shared. For example, the permanent truth that a stage of Caesar crosses the Rubicon is determined by the fact that such stage permanently instantiates the property of crossing the Rubicon. Crucially this obtains *regardless* of whether the property at stake is shared or not. The presently true Instant Proposition, for example, contains the truth that a stage of Caesar is crossing the Rubicon, even though the property of crossing the Rubicon is no longer shared with Caesar (and, accordingly, is presently false that Caesar crosses the Rubicon). This shows that also non-shared properties determine the truths included into Instant Propositions and partake to the history of the world.

Of course, shared and non-shared properties determine different truths and different components of an Instant Proposition; they determine truths about the properties instantiated by concretables and truths about the properties instantiated by some stages respectively. But this does not undermine DW's egalitarianism. Since an Instant Proposition includes both truths determined by shared properties and truths determined by non-shared properties, there is no special intimacy between the present Instant Proposition and a specific hypersurface. Thus, also the hypersurfaces that don't host shared property determine truths which are included in the present Instant Proposition (and in any other Instant Proposition, since those truths are permanent). Furthermore, since in this setting the number of stages outnumbers the number of

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picture, change is about what individual concretables enter into the sharing relation with a stage. But it is always the case that a concretable enters in the sharing relation with each stage. So, the properties of all stages are presently shared, although there is change in with what individual concretables they are shared. This view eludes the point at stake, for each and every property would determine some truth about what properties concretables instantiate. Furthermore, this view eludes also the point discussed previously, in that each and every property would be subject to double instantiation. But this view entails that the sharing is somewhat promiscuous. For example, the properties of crossing the Rubicon are instantiated by (i) a stage (eternally), (ii) the concretable Caesar (temporarily), (iii) infinitely many concretables different from Caesar (temporarily). The same lifetime would be lived thorough by infinitely many individuals.

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concretables, it turns out that the measure of truths about the properties instantiated by stages is greater than the measure of truths about the properties instantiated by concretables. And, in turn, since the majority of stages does not stand in the sharing relation with a concretable, it follows that the measure of truths about non-shared properties is greater than the measure of truths about shared properties. So, as a matter of fact, within the present Instant Proposition, the body of truths determined by properties that are not shared is greater than the body of truths determined by properties that are shared.

A further objection to the clam that DW respects Hypersurface Egalitarianism is that, although sharing does not in itself make for metaphysical specialness, in the present context plays a role that generates such metaphysical specialness nonetheless.[99] One can insist that shared properties are the only temporary properties within spacetime and that this makes for a distinction between spacetime regions that host temporary properties and those that do not: one spacetime region among the others is the only one with temporary properties located in it. In such a way, specialness would be tracked back to temporariness itself and to its limited distribution in spacetime.

I am unsure how much seriously this thought should be taken. Even if it is conceded that temporary properties are in fact hosted at only one region, it still remains to be showed that temporary properties are metaphysically more special than their eternal counterparts. That's not trivial. After all, what usually establishes the metaphysical weightiness of a property is not its temporal profile but its nature. Consider Moderate Temporalism. In a Moderate Temporalist setting there are derivative temporary properties and fundamental eternal properties. The fact that derivative properties are temporary does not make them less derivative, and the fact that

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[99] Thanks to Giuliano Torrengo for raising this objection.

fundamental properties are eternal doesn't make them less fundamental. There is a clear sense in which the metaphysical bearing of a property is unaffected by its possible temporariness. I shall not press this reasoning further. Indeed, the assumption that shared properties are the only temporary properties is not to be granted. Upon reflecting on the picture provided by DW, one can identify a class of properties which are temporary within DW and which are yet non-shared. Recall what we said about higher order temporary truths in Chapter 2. These properties are time-shifted properties about the sharing relation. Consider the property of *having being shared n time units* ago and the property of *being going to be shared in n time units*. These properties are instantiated at regions which are different from the regions where shared properties are instantiated: they are instantiated by the qualitative profiles of those stages whose properties are not shared. As time passes, the indexes involved in these properties change, in such a way that, for example, a stage transitions from instantiating the property of *sharing its qualitative profile n units ago* to the property of *sharing its qualitative profile n+1 units ago*. This change is qualitatively harmless and does not affect neither stages nor concretables, yet it distributes temporary properties across spatiotemporal regions. Thus, temporary properties are present everywhere in spacetime.[100]

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[100] A related concern about the nature of the sharing involves empirical detectability. One might grant that DW does not violate Hypersurface Egalitarianism but still claim that DW is exposed to (a version of) the Objection from Spacetime. In particular, one can contend that shared properties, while metaphysically harmless in themselves, constitute a class of properties that is not detected by spacetime physics and that as such is in tension with the first premise of the objection, particularly with the Modesty premise and the Restricted Austerity component. DW entails some metaphysically harmless and yet detectable difference obtaining among spatiotemporal regions and, in the context of spacetime physics, this makes the whole view collapse on violations of the principle according to which spatiotemporal reality should not be supplemented beyond physics. I believe this objection ought to be rejected exactly because shared properties don't constitute a class of properties which eludes physical detectability. Consider again the metaphysical phenomenon of sharing. As said already, the sharing (i) leaves the qualitative profile of the properties involved into it untouched and (ii) does not add anything to the qualitative profile of the properties involved in it. The first point puts DW in the position to accept everything physics says on the qualitative of the properties distributed across spacetime. And, more importantly, the second point puts DW in the position to accept everything physics says *without* adding any new element to it. Hence, in the spatiotemporal reality envisaged by DW there are no qualities which physics does not observe and have room for. At this juncture, one might insist that, still, thought there are no qualitative detectable differences between spacetime regions, there must be non-qualitative detectable differences. For example, a region hosting shared properties would be detectable, and hence distinguished, because it hosts two things – an atemporal bearer (a stage) and a parasite (a concretable) – instead of only one. The issue with this response is assuming that non-

4.3   Sharing and Naturalness

So far, I discussed and rejected what I take to be the most natural objections against DW's egalitarianism. I now want to tackle the issue from a different angle, by engaging with the more general question of what it is for a property to me metaphysically more special than the others in the context of temporal metaphysics. This requires a little detour. Assessing this question is not trivial since different temporalist theories disagree on how the metaphysical distinction at stake in their pictures should be characterized, e.g. moving spotlighters will claim that the distinction is about instantiating fundamental presentness, and Minimal A-theorists will claim that the distinction is about being concrete. Dorr (*Counterparts*, ch. 1) provides a way of raising the question which allows a relatively huge degree of neutrality on the nature of the metaphysical distinction at stake. The metaphysical distinction at stake can be understood by appealing to the notion of Lewisian *naturalness*. In this framework, properties are separated by different degrees of naturalness, with some perfectly natural properties as a 'limiting case' – see Dorr & Hawthorne (2014: 3). For example, properties like *being negatively charged* and *being negatively charged or being a black cow* are paradigmatic instances of properties separated by degrees of naturalness, with the former being obviously more natural than the latter. The thought is that the metaphysically distinguished hypersurface instantiates a property

qualitative differences are in fact detectable – see, for example, Dasgupta (2009) and Builes (2021). As it happens, consensus there is that they are not. It is widespread to assume that physics is sensible to merely qualitative properties and detects nothing like individuals. And, in fact, according to some, e.g. Dasgupta (2009), this is indeed evidence for thinking that individuals cannot be fundamental in their own right. Thus, there is little space for any charge relying on non-qualitative detectable differences among regions, unless one is willing to embark in a revisionary account of physical detectability. The non-qualitative differences predicted by DW are not in contrast with what physics can in principle detect. One can maintain that spatiotemporal structure is the one described by physics and maintain that such structure determines non-fundamental non-qualitative facts which, qua non-qualitative facts, are not detected by physics but ultimately depend on spatiotemporal structure. In such a way the Modesty premise is respected. Furthermore – as noted in Chapter 2 while discussing temporary necessities – DW, while relying on a distinction between qualitative and non-qualitative truths doesn't have to endorse the view that individuals are fundamental. One can maintain that non-qualitative truths are in fact non-fundamental and that (concrete and non-concrete) individuals are not part of the fundamental realm of reality. Thanks to Giuliano Torrengo for raising this point.

which is more natural than the properties instantiated by the other hypersurfaces. This property can be identified with a perfectly natural property (this is what a view like the Moving Spotlight does by introducing presentness) or with a property which just is more natural than the ones instantiated by the other hypersurfaces but which is not perfectly natural in itself. In the former case, the property at stake will be part of the fundamental furniture of reality, in the latter case it will not. The suspicion exposed above can thus be phrased in terms of naturalness. One may suspect that shared properties are more natural than non-shared properties. If this were the case, while not being a perfectly natural property, the property of being shared would be more natural than the others thereby making for a metaphysical distinction between hypersurfaces. In the following, I shall review some comparative principles for naturalness, arguing that the property of being shared is not more natural than the property of not being shared.

4.4   Reference Magnetism

A comparative principle for establishing whether a property is more natural than another is *Reference Magnetism.*

> **Reference Magnetism:** The more natural a property is, the easier it is to refer to, *ceteris paribus*.

There is a number of complications – e.g. complications about mental content and about the relation between semantic and non-semantic facts – in the proximity of this principle. However, the core intuition is relatively straightforward: to a greater degree of naturalness corresponds a greater easiness of reference. If a property is more natural than another, then, *ceteris paribus*, such property is easier to refer to. Dorr & Hawthorne (2014) suggest interpreting easiness of reference in terms of nomically possible worlds: a property is more natural than another if and

only if, *ceteris paribus*, the measure of the *nomically possible worlds* in which such property is referred to is greater than the measure of the nomically possible worlds in which the other property is referred to. This account is appealing as it provides results in line with basic intuitions underlying the notion of naturalness. For instance, since *ceteris paribus*, there are more nomically possible worlds where the property of *being negatively charged* is referred to than nomically possible worlds where the property of *being either negatively charged or a black cow* is referred to, the former property is more natural than the other.

Prima facie, it is not clear how the sharing can play a role in determining easiness of reference. In particular, since the sharing leaves untouched the qualitative profile of the properties involved, it is hard to see how the view that shared properties are easier to refer to can be defended without assuming that such easiness of reference is due to some non-qualitative factor. What this non-qualitative factor could be, however, is in turn at the very least not easily seen.

A way of interpreting this factor is by means of the following thesis:

> **Self-Reference Assumption:** For a subject it is easier to refer to its own properties as opposed as to those of the other subjects.

The Self-Reference Assumption is licensed by natural considerations about how subjects refer to themselves, most notably by using a first-personal indexical which arguably denotes the properties that they instantiate.

If the Self-Reference Assumption is granted, an argument to the conclusion that shared properties are easier to refer to can be built. Consider concretables. Concretables (i) instantiate only shared qualitative properties and (ii) have a preference for their own properties. Hence, for concretables it is easier to refer to shared qualitative properties. For example, for a concretable it is easier to refer to her own shared properties than to the non-shared properties of a stage whose properties used to/will be shared. For Caesar it is easier to refer to his own shared properties of crossing the Rubicon than to the not yet shared properties of being stabbed by Brutus which are instantiated by one of his future stages. A similar reasoning can be developed by considering the class of those stages whose properties are shared. Given the Self-reference assumption above, it turns out that also these stages have a preference for their own shared properties.

This line of reasoning, however, does not withstand scrutiny. Even granting the Self-Reference assumption, there are obvious counterexamples to the view that shared properties are easier to refer to. Consider the class of those stages whose properties *used to/will be* shared. The stages of this class (i) instantiate only properties which are not shared and (ii) have a preference for their own properties. It turns out that for these stages it is easier to refer to to non-shared properties, in contrast to what the argument at stake is supposed to establish. As a matter of fact, stages have a preference for their own properties *regardless* of whether are shared with a concretable or not. The point generalizes to time-shifted properties like having been shared *n* time units ago and being going to be shared in *n* time units, for these time-shifted properties fall under the general kind of properties which in fact are not shared. A stage has a preference for its own properties regardless on how the index *n* in the time-shifts is specified.

It may be wondered whether this counterexample is strong enough. I believe it is. Unless one wants to assume that concretables should play a greater role in establishing facts about reference than stages, the presence of stages with a preference for non-shared properties undermines the reasoning introduced above. I find hard to see what could motivate such assumption. Within DW, stages are things which have the very same qualitative profile of ordinary entities such as persons. It seems merely ad hoc to exclude them from the class of referents that should legislate of facts concerning Reference Magnetism. Nor does the fact that stages strictly speaking fail to classify as persons play a role here. Indeed, it is a widespread assumption that, in order to assess cases of reference magnetism, one can bring about entities which do refer to things but which are in fact not persons (as we shall see shortly, that's what Bacon does while discussing his theory).

These considerations gain additional support once formal tools for evaluating cases of reference across possible worlds are taken into account. Recall Dorr's and Hawthorne suggested criterion for evaluating facts about reference. In their setting, for a property to be easier to refer to than another, the measure of *nomically* possible worlds where such property is referred to has to be greater than the measure of nomically of possible worlds where the other property is referred to. DW is intended to describe metaphysical truths. According to DW it is a metaphysical truth that in each and every world there are (i) concretables, (ii), stages, and (iii) a temporary sharing relation between them. Since nomically possible worlds are a subset of the metaphysically possible worlds, it turns out that, once the setting of DW is accepted, there cannot be a nomically possible world where the facts about stages and concretables illustrated above fail to obtain. In each possible world there has to be (i) a class of concretables instantiating shared properties, (ii) a class of stages whose properties are shared, and (iii) a

class of stages whose properties are not shared.[101] As a consequence, the measure of nomically possible worlds where shared properties are easier to refer to cannot be greater than the measure of the nomically possible worlds where non-shared properties are referred to.

This result has some dialectical importance in the context of the theories that aim at endorsing Hypersurface Egalitarianism. Recall Bacon's view. As said in Chapter 1, the core insight of Bacon's view is that spatiotemporal hypersurfaces temporarily instantiate a plurality of time-shifted properties. It is essential for Bacon to maintain that these properties are metaphysically on a par and, relatedly, equally natural. A counterexample to this is that we have at least some preference for a given class of time-shifted properties (say the one with index n) over the others. Bacon (2018: *footnote* 34) briefly responds to this worry by appealing to the conceivability of an alien species which, upon being provided of a different physiological make up, prefers another class of time-shifted properties. Bacon's strategy is at least partially vulnerable to the objection that the measure of the nomically possible world inhabited by such alien species is in any case not big enough for impinging the easiness of reference of the class of properties privileged by humans.[102][103] It should be clear why DW, while being entangled with a similar dialectic, is better placed than Bacon's theory.

4.5   Similarity and Dissimilarity

Two other comparative principles are Similarity and Dissimilarity.

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[101] Of course, in some of these worlds both concretables and stages may lack some properties which are arguably necessary for reference, such as being conscious and capable of intentionality. But this does not affect my point as (i) one could still develop plausible counterfactuals about how facts of reference would be like in those worlds if there were some consciousness and (ii) the measure of nomically possible worlds where shared properties are referred to would still not be bigger.

[102] Bacon's aliens might of course still inhabit the actual world, but still seems plausible that they will not be distributed over a vast measure of nomically possible worlds.

[103] Dorr & Goodman (2019: *footnote* 42) make a similar point.

Similarity: The more natural a property is, the more it makes for similarity among things that share it.

Dissimilarity: The more natural a property is, the more it makes for dissimilarity among things that are divided by it.

These principles embed the intuition that natural properties account for the relations of similarity and dissimilarity holding across entities. There is a number of worries about how these principles have to be specifically understood and put to work. Most notably, the notions of similarity and dissimilarity are particularly tricky to interpret and even when modelled modally some complications arise – see Dorr & Hawthorne (2014: 22-23). In the following I will not endorse a specific account for understanding similarity and dissimilarity. My hope is that, in the case at stake, we have relatively clear judgments on how shared properties interact with similarity and dissimilarity.

In order to charge DW with Hypersurface Disparity, one has to show that shared properties make more for similarity and dissimilarity than non-shared properties. I believe that there are good arguments against this view. I shall now illustrate them by reviewing how similarity and dissimilarity plausibly work in the case of stages and concretables.

Let's start by assessing the case of stages. For stages instantiating a shared or non-shared property is qualitatively the same. The sharing does not affect their qualitative profiles. As a consequence, it can hardly bring about a greater degree of similarity/dissimilarity. Consider an example. Say that two stages both instantiate the property of being blonde. This obviously

makes for a similarity among them. The degree of their similarity, however, is in no way affected by whether their respective instances of the property of being blonde, in addition to being merely instantiated, are *also* shared with a concretable. To put it another way, the stages at stake possess the same degree of similarity *regardless* of whether their properties are shared with their respective concretables or not.[104] Thus, there hardly is a difference which the sharing brings about in the similarity of stages, let alone a difference greater than the difference brought about by the instantiation of non-shared properties. An analogous reasoning applies, *mutatis mutandis*, to Dissimilarity.

Let's now turn to the case of concretables. Their case is a bit different from the case of stages. While stages instantiate both shared and non-shared qualitative properties, concretables instantiate only shared qualitative properties.[105] Does this affect in some way the task of assessing cases of similarity and dissimilarity? I believe it does, for it is plausible that, in order to assess those cases, both the compared properties need to be instantiated by the entities at stake. That is, I endorse the following Instantiation Assumption:

> **Instantiation Assumption**: In order to assess the degrees of similarity/dissimilarity brought about by two properties it is necessary that these two properties could be instantiated by the targeted entity.

The Instantiation Assumption is supported by some reasoning on the implications that an opposite approach would have. Consider the following Parody Argument of this approach:

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[104] And, of course, also regardless of how the units specified in the higher-order time-shifts are specified.
[105] How about the non-qualitative properties of concretables? Since these properties are instantiated only by concretables and not shared with anybody, the same reasoning exposed below applies to them as well.

Parody Argument: two fishes are made more similar by the property of having gills than by the property of having lungs, for they only have the property of having gills. So having gills makes more for similarity than having lungs.

Since the conclusion of the Parody Argument is obviously untenable, I believe the Instantiation Assumption should be licensed.

How does this relate to the case of concretables? As it turns out, concretables don't meet a necessary requirement for assessing whether shared properties make more for similarity/dissimilarity in their case than non-shared properties. An argument according to which shared properties are more natural can thus hardly be given in their case.

As noted above, a more fine-grained account of the notions of similarity and dissimilarity in play in the principles at stake can be given – even though there is no obvious way to do so. What I have done here is working with a much more coarse-grained account of similarity and dissimilarity. I take this practice to be legitimate and I consider the results obtained in line with an intuitive understanding of the role played by similarity and dissimilarity relations among entities – the kind of understanding of similarity and dissimilarity which a fine-grained framework for modelling the notion should also account for.[106]

Let me take stock. I considered some possible strategies for arguing that shared properties are more natural than non-shared properties and contended that they both fail. There might be other

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[106] Furthermore, it is worth mentioning that a relatively attractive way of modelling the principles given above develops results in line with the thesis that the properties at stake are equally natural. A modal interpretation of Similarity and Disparity predicts that a property (like the property of being shared) and its negation (like the property of not being shared) play the same role with respect to similarity and dissimilarity and are thereby equally natural – see Dorr & Hawthorne (2014: 22).

ways to argue for a greater naturalness of shared properties,[107] and more generally more ways to argue for DW entailing a metaphysical distinction between hypersurfaces. However, I take the arguments provided here to rule out the most natural ways to argue that DW commits to Hypersurface Disparity. At the very least, the burden of the proof shifts on those which are willing to charge DW with such commitment.

Thus, DW eludes any Objection from Spacetime which specifies premise (1) as being about a metaphysically distinguished hypersurface. To put it another way, DW eludes what we called the Argument from Pre-Relativistic Spacetime.

4.6   Frame-Relative Qualitative Profiles

Let's move now to the question of whether DW requires a privileged foliation and hence violations of Foliation Relativity. While introducing DW, I said that stages are three-dimensional entities. In a spacetime setting this entails that a stage is identical to a collection of simultaneous spacetime points which aggregate in a spatially extended aggregate. However, in a relativistic spacetime the simultaneity of a collection of simultaneous points is a merely frame-relative matter. As a consequence, three-dimensional stages are merely frame-relative entities[108]. A natural assumption in this context is that stages are cross-sections of an *invariant*

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[107] One way – which for sake of brevity I briefly consider outside the main text – is by appealing to Simplicity:

> **Simplicity:** One property is more natural than another iff the former has a definition in terms of perfectly natural properties that is simpler than any definition of the latter in terms of perfectly natural properties.

However, Simplicity can hardly provide the basis for arguments against DW's egalitarianism. Shared properties and non-shared properties are qualitatively the same. So, they presumably are alike in terms of definitions. For example, both the shared property of being blonde and the non-shared property of being blonde are defined in terms of some biological fact (having to do with the genetical makeup of the entities involved) or metaphysical fact (such as the instantiation of universals or tropes). Alternatively, one may think that shared properties, by contrast to non-shared properties, involve two individuals in their definition (the primary bearer and the parasite), but this seems to make their definition more complicated rather than simplifying them.

[108] For this reason, some doubt that stages can play any distinctive explanatory role with respect to persistence, see Gibson & Pooley (2006).

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four-dimensional volume, corresponding to the trajectory that a relativistic object has throughout spacetime.[109] In turn, the properties instantiated by stages, and their overall qualitative profiles, are frame relative as well. For example, the shape and the mental states associated to an invariant volume are *prima facie* subject to variation across different reference frames.[110] Furthermore, in addition to ordinary and familiar qualitative profiles, there are many other profiles, some of which extremely unfamiliar. For example – as argued in Sattig (2015: ch. 8) – there are reference frames which include point-sized objects, and – as argued in Demarest (2025b) – there are reference frames which include weird 'rogue' mental states which go astray from the mental states ordinarily had by persons. A relativistic DW has to cope with these distinctively relativistic phenomena.

I want to develop a relativistic DW where the sharing of properties spans over the frame-relative stages and the frame-relative qualitative profiles of a given invariant four-dimensional volume. The core tenet of this account is that the qualitative profiles involved in sharing, rather than being invariant, are frame-relative properties which arise only within cross-sections of the original volume. A concretable like Caesar, for example, instantiates the frame-relative qualitative profiles of a given volume via a sharing relation with the three-dimensional frame-relative stages of such volume. As time passes, there is a change in which frame-relative qualitative-profiles Caesar instantiates.

There are some immediate questions about this approach. Why does a given concretable instantiate the frame-relative profiles of a given volume as opposed to another? And does a concretable instantiate *all* the qualitative profiles that this volume has in different frames?

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[109] See, for example, Sattig (2015: 221).
[110] see, inter alia, Balashov (2010), Sattig (2015), Lee (2007) and Demarest (2025b) for more on these topics.

Perhaps it is clear that the first question encodes the relativistic version of the Sortal- and Individual-Question discussed in Chapter 2. The second question, by contrast, touches upon a distinctively relativistic issue. Let's say that a concretable instantiates the frame-relative profiles of a given individual four-dimensional volume. Does it instantiate all of them or only some? As a matter of fact, the volume at stake will have the most diverse qualitative-profiles. In some frames it will be bent-shaped, in others straight-shaped, and in other even point-shaped.

The strategy outlined in Chapter 2 for tackling the Sortal-Question can be fruitfully extended to the relativistic case. A natural thought, springing out from such strategy is that, provided that a concretable is associated with a given four-dimensional volume, such concretable should instantiate *only* those profiles which cohere with the sortal under which it falls. Consider a given concretable falling under the sortal of being a person.[111] Properties can be shared with this concretable only if those properties cohere with the sortal of being a person. A result of this is that the set of frame-relative qualitative profiles which are temporarily shared with the concretable at stake is constrained in a way which preserves our judgements on the nature of the concretable at stake. For example, this rules out scenarios where Caesar ends up instantiating frame-relative qualitative profiles where he has unfamiliar properties such as being point-sized or having unfamiliar mental states.[112] Caesar ends up temporarily instantiating qualitative profiles which are hosted within some but not all foliations.[113]

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[111] More precisely, this sortal should be characterized as a sortal according to which, if a concretable is concrete, then such concretable instantiates the properties associated with personhood. For sake of readability, in the main text I omit this complication.

[112] As argued in greater detail below, this makes for an overall virtue of DW.

[113] As it turns out, Caesar is concrete in some but not all frames. For example, in a frame where the cross-section of the volume associated with Caesar is point-shaped, Caesar is not concrete. This is because there is no sharing relation obtaining between the concretable Caesar and the qualitative-profiles arising within such frame. This implication of the view reminds an implication of the Minimal A-theory discussed by Emery (2021: 495-498). In the context of the Minimal A-theory, it turns out that concreteness is relative to a frame. However, this similarity between DW and the Minimal A-theory is again superficial. DW holds that, albeit Caesar is not concrete in some frames, the qualitative profiles arising within such frame are still instantiated by the three-dimensional stages inhabiting such frame. The Minimal A-theory doesn't have room for anything like this.

A concern about this strategy is that the measure of the frame-relative qualitative profiles which match the sortal of being under which Caesar falls is still bigger than one would expect. A result of this is that, unless additional constrains on Sharing are imposed,[114] while Caesar instantiates only qualitative profiles which match his own sortal, he still instantiates some frame-relative qualitative profiles which are not ordinarily associated with him and the happenings of his specific lifetime. For example, a qualitative profile where, at a point of his life, while still being a Roman general fighting in Gallia, rather than having a given bent shape, he has a different straight shape.

It is not clear, however, how much traction this concern has. For one, a natural response to it is saying that the overpopulation of qualitative-profiles matching Caesar's sortal is just an implication of Special Relativity Theory and should be accepted as such. This style of response may or may not be convincing. What is important is that friends of DW are not alone in endorsing it, as friends of other metaphysical views, most notably the B-theory, are in their same position with respect to the issue at stake – and indeed versions of the present issue have been first discussed in contexts that presupposed the B-theory of time, for example in Gilmore (2006) and Sattig (2015).

Furthermore, I believe that the apparent strength of this concern gets weakened once some considerations about consciousness and Relativity are taken into account. As argued by Demarest (2025b), there are good reasons – having to do with the functional and causal roles

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[114] Can one of strategies outlined for tackling the Individual-Question provide those constrains? I believe they cannot as, in a relativistic setting, it would be arbitrary to hold that only one given set of qualitative profiles should be associated with an individual: both a set of qualitative profiles including a stage crossing the Rubicon and being bent and a set of qualitative profiles including a stage crossing the Rubicon and being straight presumably count as profiles of Caesar. So, it seems that an individual must be associated with multiple frame-relative profiles.

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played by frame-relative mental states – for assuming that only one foliation, namely a subject's local rest foliation, is associated with qualitative profiles which cohere with the consciousness had by persons.[115] If this is granted, it turns out that the qualitative profiles of Caesar's consciousness are still not more numerous than we would ordinarily expect, for, in the phenomenal case, only the qualitative-profiles associated with a volume's rest foliation would be shared with Caesar. So, even in a relativistic setting, Caesar would have exactly the same consciousness which we ordinarily take him to have, although the non-shared cross-sections of the volume associated with him, of course, may exhibit weird mental states. This allows to rule out untenable scenarios where Caesar (and any other subject) has some weird form of relativistic consciousness, or some consciousness that deviates from the one he actually has.

A second concern about this account, is that the strategy at stake might be incompatible with Foliation Relativity because it privileges the foliations hosting properties matching ordinary sortals. As argued in the previous sections, the sharing of properties doesn't make for a metaphysical distinction among shared and non-shared properties. As a consequence, those foliations which host properties that are shared *prima facie* don't seem to be metaphysically distinguished over the others. However, some may contend that if the sharing of properties applies only to some foliations, another subtler sort of metaphysical distinction arises. Even if there is no special hypersurface within any foliation, a foliation would still be distinguished as the one that singles out those stages whose properties can in principle be involved into the temporariness of sharing. For example, a foliation singling out stages matching Caesar's sortal would be distinguished from a foliation that does not in that such foliation, in contrast to the

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[115] Lee (2007) disagrees and argues that phenomenology is frame-invariant. This does not undermine my point, as, if phenomenology were frame-invariant, then Caesar would still instantiate qualitative profiles which match the consciousness that we expect him to have.

other, would be the only one hosting stages liable of being involved into sharing and temporariness. Some foliations would be, so to speak, blessed with temporariness while others would not. This might seem a feature which distinguishes foliations in a sense which violates Foliation Relativity.

The step from these suggestive remarks to a genuine argument showing that DW entails some violation of Foliation Relativity is far from obvious. For one, it is not clear why the presence of temporariness within only some foliations should be given so much weight, provided that temporariness in the present case is built around the metaphysically innocent notion of sharing. But for sake of argument let's concede that, if temporariness were to apply exclusively to the properties hosted in some foliations, then DW would fail to vindicate Foliation Relativity. It is crucial to emphasize that this implication can be avoided. It can be postulated that, in addition to concretables which fall under familiar sortals and which, via a sharing relation, temporarily instantiate the familiar qualitative profiles hosted by some foliations, there are also concretables which fall under unfamiliar sortals and which, via a sharing relation, temporarily instantiate the unfamiliar qualitative profiles hosted by other foliations.[116] A result of this is that, even within a foliation singling out point-sized stages, qualitative profiles would be shared with concretables falling under the appropriate sortals. In this way, temporariness would not apply only to some foliations, but to all of them.

Of course this move presupposes that the number of non-concretables and of sortals is vastly bigger than what one would expect. To be clear, the view I just described entails that, together with ordinary concretables instantiating ordinary properties via sharing, there are other

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[116] This entails that a concretable falling under a familiar sortal and a concretable falling under an unfamiliar sortal might instantiate some of the frame-relative profiles of the same volume, thereby overlapping to some extent. This is not an issue as obvious qualitative as well as non-qualitative differences between the two still stand.

concretables instantiating unfamiliar and weird properties in the same way. This may look baffling at first. However, friends of DW might be happy to concede this, while claiming that this phenomenon should be seen as an implication of their view which is no weirder and more revisionary than the relativistic facts themselves. Special Relativity is a revisionary theory; it can be insisted that any metaphysical account developed within its setting should be supposed to come with at least some revisionary and surprising implications, including those theories which are assumed to have a peaceable relationship with Special Relativity, like the B-theory. Furthermore, this phenomenon has some analogy in the metaphysics of modality. Discoveries in physics enhance our epistemic access to nomic possibilities. As physics advances, new possibilities and impossibilities which would otherwise not have been thought of are discovered. An approach to modality built around the adoption of concretables needs to introduce new concretables in order to account for all the possibilities and impossibilities involved in our updated modal reasoning. For example, in a Necessitist setting, upon learning about the progresses of physics, one has to inflate her ontology, e.g. by postulating that there is a necessarily non-concrete thing which travels faster than the speed of light. It can be thought that it is hardly surprising that in the temporal case something analogous obtains, once Relativity is taken into account.

A third concern is about the status of shapes. According to a relatively plausible account – defended by Balashov (2010) – the shapes which are singled out by different reference frames are only cross-sections of the shape possessed by an invariant, four-dimensional volume of spacetime. Arguably, this allows a neat explanation for the presence of three-dimensional shapes within frames.[117][118]As Sattig (2015: 220) puts it '[frame-relative shapes] are unified by

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[117] In Balashov's view, this explanation is available only to the perdurantist theory of persistence, thereby making for an advantage of perdurantism over its competitors.
[118] This reasoning can be extended to the case of other qualitative properties, but since the discussants of this topic in the literature have been focusing on shapes, I shall stick to shapes as well.

an invariant shape from which the various shapes are derived'. Since DW puts so much weight on frame-relative qualitative profiles, it may be wondered how it relates to this matter.

It should be emphasized that for DW this kind of account is perfectly open. Within DW it is possible to (i) claim that frame-relative shapes are involved into sharing and (ii) maintain that those frame-relative shapes are just cross-sections of an invariant underlying four-dimensional shape instantiated by a four-dimensional volume. The fact that these shapes are derived from an invariant volume, in fact, does not entail that they cannot be involved into a temporary shared relation.

Additionally, this makes for a significant virtue of DW. Recall that DW identifies ordinary entities with concretables instantiating properties via sharing. In a relativistic setting, as just seen, it turns out that, in addition to ordinary entities, there are also weird relativistic entities instantiating properties via sharing as well. It is now crucial to note that all these entities here are distinct from a four-dimensional volume. These entities instantiate the frame-relative profiles of a volume, but are not identical to it. In some cases, like in the case of ordinary objects and persons, a concretable is different from a volume both non-qualitatively and qualitatively. It is different non-qualitatively for, rather than being identical to a volume, it is identical to a concretable instantiating some of the volume's profiles via sharing. And it is different qualitatively for, rather than instantiating all the frame-relative profiles of a volume, it instantiates only some of them (those that match its ordinary sortal). In other cases, like in the case of extremely weird relativistic objects, it can well be that the difference between a concretable and a volume is merely non-qualitative. For example, it is conceivable that an unfamiliar relativistic object might instantiate all the frame-relative profiles of a volume. This makes it qualitatively very much alike the volume, although, of course, the volume instantiates

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its profiles in a more primitive way while the concretable at stake does it only thanks to a sharing relation. But a major, non-qualitative difference still stands, for the relativistic object at stake, rather than being identical to a volume, is identical to a concretable entity.

In short, there is a clear distinction between objects (ordinary and relativistic) and four-dimensional volumes. An implication of this is that the things which are true of volumes, are not necessarily true of objects. For example, while it is true of a volume that it instantiates a frame-relative profile where its shape is point-sized, the same is not true of a (ordinary) object. No sharing relation holds between the concretable of an ordinary object and a qualitative profile where such object is point-sized. And this is how out judgement that ordinary objects don't have a point-sized shape is preserved. In contrast to other views,[119] DW is fit for (i) endorsing a plausible account of shapes within a relativistic setting and (ii) accounting for natural judgements about the frame-relative properties of ordinary objects.

A final clarification is about how the present picture relates to those views which – like Fine's *Fragmentalism* (2005) – recover tensed temporalist truths by giving up the assumption that reality is a coherent whole. It should be clear that the relativistic version of DW here explored does not entail anything like the view that various temporalist truths don't cohere each other. Recall the Instant Propositions introduced in Chapter 2. Each of these propositions has to be consistent: it has to include only mutually compatible propositions. This applies also to a relativistic setting. The truth that a given frame-relative qualitative profile is shared with a given concretable is perfectly compatible with the truth that another, numerically different frame-relative profile is shared with another numerically different concretable.

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[119] Some of which are criticized in Sattig (ch.8).

I take these considerations to show that the context of Special Relativity is not particularly hostile to DW. DW vindicates Foliation Relativity. Additionally, DW provides an attractive picture of relativistic shapes. This is enough for considering the relativistic version of the view as promising. But the story does not stop here, as there are additional complications facing the theory in a relativistic setting.

4.7   Synchronicity

Consider the following thesis:

> **Synchronized Sharing:** If a stage located at hypersurface h has its properties shared with its own concretable, then all the other stages located at h have their properties shared with their respective concretables.

Synchronized Sharing is attractive in that it secures some intuitions about how numerically distinct ordinary entities interact together. In particular, it accounts for the fact that concretables are appropriately synchronized one with the other. For example, Synchronized Sharing secures that while Caesar instantiates the properties of a stage which gets stabbed by Brutus, Brutus instantiates the properties of a stage who stabs Caesar. Caesar's and Brutus stages, in fact, inhabit the very same hypersurface – which in ordinary language we would qualify as an instant of time March 15th, 44 BC.

A question that friends of DW must face is whether Synchronized Sharing is tenable in their setting.[120] The answer to this question varies depending on the spacetime physics assumed in

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[120] As Bacon (2018: *footnote* 14) notes, Dorr's view is subject to similar concerns. It could be that what I shall say applies to Dorr's view as well, in a way or another. But again I shall not delve into this matter.

the background. In a Neo-Newtonian setting, Synchronized Sharing is tenable, for in a Neo-Newtonian setting there are absolute facts of the matter about whether any two stages are located at the same hypersurface or not. If a Relativistic Spacetime is assumed in the background, however, things are different. Within a relativistic setting, simultaneity is frame-relative. As a consequence, it is frame-relative whether two stages are located at the same hypersurface. In turn, in accordance with Foliation Relativity, each foliation of spacetime into hypersurfaces has equal standing. It is hard to see how Synchronized Sharing can be recovered without being in flagrant violation of Foliation Relativity. That is, it is hard to see how Synchronized Sharing can be endorsed without presupposing at the outset that there is some privileged way of establishing whether two stages are located at the same hypersurface. Given that DW is intended not to violate Foliation Relativity, it follows that DW is not in a position to endorse Synchronized Sharing. Or, to put it another way, it emerges that respecting one of the core morals of Special Relativity comes at the cost of dropping our intuitive judgements about synchronicity.

A way out from this implication is amending Synchronized Sharing in a way which is respectful both of Foliation Relativity and our judgements. This strategy is not easily achieved, but some inspiration might come from the literature on causation. In particular, it can be held that causation is a frame-invariant phenomenon which regulates the machinery of sharing. A candidate principle[121] goes as follows:

Causal Synchronized Sharing: If a stage S has its properties shared with its own concretable, then all the stages causally related with S have their properties shared with their respective concretables.

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[121] Thanks to Jack Shardlow here.

There are two main issues with this principle. The first is that it is not entirely clear that causation is a frame-invariant phenomenon. For one, the relata involved in causal relations (such as stages) are in themselves frame-relative partitions of an invariant spatiotemporal volume. And the fact that the relata are frame-relative provides some support to the view that the relation holding between them has to be frame-relative as well.[122] The second issue is that, even granting that Causal Synchronized Sharing obtains, a wide variety of synchronicity judgements would not be recovered, for there is more to our synchronicity judgements than just mere causal interaction. For example, Causal Synchronized Sharing does not rule out that, while the properties of a stage drafting a paper are shared with me, the properties of a stage getting stabbed by Brutus are shared with Caesar. Nor it rules out that, while the properties of a stage drafting a paper are shared with me in 2024, properties of being the president of the United States are *not* shared with Joe Biden. So, besides being controversial in itself, Causal Synchronized Sharing would also bring only partial relief to the conflict between DW and some basic intuitions about synchronicity.

Although I don't take these considerations to be conclusive,[123] I believe that friends of DW should feel pressed to altogether give up the view that concretables are synchronized. In my view, they should start thinking of the sharing between concretables and stages as something which holds *irrespectively* of the synchronicity judgements which we ordinarily assume. This point can be further fleshed out by considering again Instant Propositions. In the present setting,

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[122] See Demarest's manuscript (*Special Relativity and Causation*) for arguments against the frame-invariance of causation.

[123] More fine-grained principles might rely on principled causal interaction, for example on Arthur's (2006) and Savitt's (2009) *Alexandroff's* present; see also Gibson and Pooley (2006) and Ben Yami (2019) for related considerations and accounts. One concern about this approach is that in order to isolate an Alexandroff present informing the Sharing relation, one would need to pick the Alexandroff's present associated to an arbitrary spacetime point.

there can be an Instant Propositions which, for example, includes both the truth that Caesar is crossing the Rubicon and the truth that Columbus is landing in the New World. Or, even more dramatically, there can be an Instant Proposition which includes the truth that Caesar is crossing the Rubicon, the truth that that Columbus is landing in the New World, and the truth that some unfamiliar relativistic entity instantiates some weird point-sized shape. To put it this way: friends of DW should accept that, while their consciousness is centred over the perspective of one specific stage, the consciousness of other concretables might be centred over the perspective of the most distant, remote, weird, and inaccessible stages.

How outrageous is this? *Prima facie*, a systematic lack of synchronicity may seem too much to swallow, even for the most obstinate friends of DW. I am myself unsure about how exactly I feel about this feature of the theory. However, I cautiously believe that there are some considerations which soften the pill and rehabilitate the relativistic DW as a promising view.

First, while admitting that the same instant of time can include both truths about what properties Caesar and Columbus instantiate, DW does in no way entail that the same instant of time can include multiple truths about what properties Caesar instantiates. That is to say, even in a relativistic DW, there will never be an instant which states both that Caesar instantiates the properties of a stage which is crossing the Rubicon and the properties of a stage which gets stabbed by Brutus. If Caesar instantiates the properties of a stage which is crossing the Rubicon, it is granted that he *will* instantiate, but does not currently instantiate, the properties of a stage which gets stabbed by Brutus. The sharing is, so to speak, always centred on only one stage among the stages that are associated to a concretable. This makes it sure that DW can

accomplish the explanatory goals briefly illustrated in Chapter 2.[124][125] Since only one stage shares properties with him, an explanation is provided for why Caesar accesses only the experiences of one brief portion of his lifetime. So, even if DW licenses failures of synchronicity it is not concessive up to the point of losing any explanatory virtue which motivates its principled adoption.

Second, it can be argued that failures of synchronicity, albeit unfamiliar and rather repugnant in themselves, are just part and parcel of Relativity. Even the B-theory allows some of them, although it keeps them confined to specific cases, such as the Twin Paradox. Some may contend that what DW does is just taking as a global what is already present in the relativistic B-theory as a local phenomenon. When things are seen under this light, the B-theory's alleged superiority as well as DW's repugnancy might be at least partly reconsidered.

Third, DW presents a number of comparative advantages over some of its competing temporalist theories, which notoriously have a hard time in being coupled with Special Relativity. At the cost of giving up synchronicity, DW manages to introduce temporalism in a relativistic spacetime without rejecting Hypersurface Egalitarianism and Foliation Relativity. The dialectical situation of DW is kindred to that of Fine's Fragmentalism, although, as seen above, the two theories are deeply different. Much as in the same way in which Fine's Fragmentalism gives up on the view that reality is a coherent whole for sake of recovering tensed temporalist truths without slipping into an overly implausible interpretation of Special Relativity, DW gives up on synchronicity for obtaining the same result. Some – especially

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[124] And to be illustrated in greater detail in Chapter 5.
[125] It also makes sure that every Instant Proposition is consistent, as it does not contain incompatible truths about what properties Caesar instantiate.

those that are convinced that temporalism is a non-dispensable element of reality – might think this is a price worth paying and follow DW where it leads.

As a result, DW is in a position to elude any Objection from Spacetime which specifies premise (1) as being about a privileged foliation. To put it another way, DW is in a position to elude what we called the Argument from Relativistic Spacetime.

Chapter 5   From Consciousness to Temporalism

In this chapter, I consider why one should feel attracted by Temporalism. I here present what I take to be the best reasons for endorsing Temporalism. These reasons come from considerations about consciousness and, more specifically, from how consciousness and persistence through time relate.

5.1   Consciousness, Persistence, and Temporalism

So the Disclosing Window is on the table now. As we have seen, DW is a theory which accomplishes the goal of eluding the Objection from Spacetime while keeping Temporalism. This is an important achievement, as long as there is any need for Temporalism. It is now time to tackle this issue and address the general question of why one should be attracted by Temporalism.

This question might be trivially answered for some. There are indeed some philosophers which take the attraction of Temporalism – or, at least, of their favorite version of Temporalism – as something which does not stand in the need for particular motivation.[126] These philosophers are perhaps persuaded by the apparent triviality of the thesis that there are some truths which are only temporary true. Or maybe they are compelled by the idea that there is something inherently wrong about the B-theory of time. As some have argued, the B-theory perhaps could be seen as a theory which generates the same kind of repugnancy of its modal analogue –

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126 Zimmerman (2008: 220), for example, believes Temporalism is simply commonsensical 'My reason for believing the A-theory is utterly banal […] it is simply part of commonsense that the past and future are less real than the present'.

Lewis' Modal Realism.[127] I am not in the number of these philosophers though. Rather, I think there are some specific reasons for being attracted by Temporalism and that those reasons are due to considerations concerning consciousness and experience.[128]

Some experiential arguments on behalf on Temporalism have been developed.[129] Many are about a phenomenon which goes under the name of experiences as of temporal passage. The core gist of these arguments is that Temporalism is needed for accounting for the apparent dynamicity of some of our experiences. These arguments are highly contentious. B-theorists have a number of ways of responding to them, e.g. claiming that, at a closer inspection, there is no such thing of experiences as of temporal passage or claiming that experiences as of temporal passage can be accounted for within the B-theory.[130] I am not interested in these arguments here. Rather, I wish to discuss an argument from consciousness to Temporalism that does not rely on experiences as of temporal passage but on other features of consciousness, such as the property of spanning over a small portion of time. In particular, the argument I will develop and defend here is that, if the B-theory of time were true, persons would fail to have a consciousness that spans over a small portion of time. And, with this argument in place, I shall show that within a temporalist setting a more plausible picture of consciousness could be reached.

Before getting at it, two caveats are in order. First, the argument shall be directed not only against the B-theory altogether, but against the combination of the B-theory and the perdurantist theory of persistence (or, more precisely, against the B-theory and theories of

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[127] See Dorr's Primordial Objection (MS: ch. 2).

[128] I share this stance with Skow (2011, 2015), who eventually argues that all the experiential arguments for Temporalism fail.

[129] An argument which does not rely on phenomenal experience but rather on attitudes of relief is, of course, Prior's Thank Goodness That's Over Argument (1959).

[130] See Torrengo (2017).

persistence built around the view that there is a sharing relation between persons and their stages). While I do believe that this combination of views has a problem with consciousness, I am not sure the same holds for other combinations (rather, there shall be reasons for thinking that a combination of the B-theory and the stage theory of persistence is immune to the argument). Thus, the argument will be limited in target: it will target only some B-theorists. Yet, since the combination of perdurantism and the B-theory is rather popular, I am hopeful the argument will keep some considerable dialectical traction. Second, the argument shall not support DW exclusively, but Temporalism more generally. So, although as I have been arguing so far there are good reasons for temporalists for being attracted by DW, the argument to be developed here provides only indirect support to the adoption of such view.

5.2 Phenomenal Consciousness in a Perdurantist Setting

Before getting at the argument, a careful introduction to perdurantism and the questions at stake is needed. I provide it in the next sections.

Perdurantism is the view that objects persist through time by being exactly located at an extended interval of time, and by having instantaneous stages as temporal parts at each instant within such interval.[131] In this setting, persisting entities are stretched out through time and, as some of the early discussants of the view have observed, have a shape which resembles that of four-dimensional *worms*. I take perdurantism to consists in the package of the following theses.

Temporal Extension: Worms are exactly located at an extended interval of time.

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[131] See, inter alia, Sider (2001) and Lewis (1986) for developments and defences of perdurantism.

Temporal Parts: Worms have instantaneous stages as temporal parts. Stages are exactly and uniquely located at an instant of time.

Temporal Parts Priority: Temporal parts are ontologically prior to the perduring worm that they compose.

Sharing:[132] A sharing relation obtains between a worm and its temporal parts.

There are views which are built around the rejection of some of the theses above which could be classified as perdurantist views. One may reject Temporal Parts while endorsing Temporal Extension and maintain that perduring worms are extended simples which in fact don't have stages as temporal parts – this view is developed by Parsons (2000). Or one may reject Temporal Parts Priority (and relatedly Sharing) and maintain that worms are prior to their parts – this is what Hawthorne (2006) considers and Skrzypek (2022) defends. Further, one may wish to reject Sharing and maintain that only temporal parts, but not worms, instantiate properties – Sattig (2006) considers and rejects this possibility. As a matter of fact, with the plausible exception of Temporal Extension (which, as Gilmore (2006) convincingly argues, is a non-dispensable defining feature of any perdurantist account), any of the theses at stake can be challenged and rejected by self-described perdurantist views. In the following, I shall focus on the package above, which I take to represent the most standard understanding of perdurantism.

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[132] I here use the label of 'Sharing' to denote the thesis that in a perdurantism holds a sharing relation between worms and parts. In Chapter 1 I used to label of 'Sharing' to describe the sharing relation between atemporal bearers and parasites. Since the relation at stake is the same, I here resort to the same label.

Sharing here is the same relation that I have been discussing in throughout Chapter 1 while considering an instance of Sharing Temporalism built within a perdurantist metaphysics. The standard assumption for perdurantist is that the sharing relation is Imperfect In the sense elucidated in Chapter 1: a worm instantiates relative to different temporal parameters the properties of its temporal parts. So, for example, if a worm has a stage located at t which instantiates the monadic property of sitting and a stage located at t^1 instantiating the property of standing, then the worm instantiates the time-indexed property of sitting at t and the time-indexed property of standing at t^1. This is a reflection of the fact that perdurantism is standardly developed within the B-theory of time.

Let us focus on how perdurantism relates to *phenomenal consciousness* – the sort of consciousness which underlies the qualitative aspect of our subjective experiences. A number of questions can be raised about phenomenal consciousness, e.g. traditional questions about the position that phenomenal consciousness has in fundamental reality – see, inter alia, Chalmers (1996) and Goff (2018). I am here interested in a different sort of questions which, rather than tackling the issue of the ultimate nature of our subjective experience, are concerned with the implications that perdurantism has with respect to phenomenal consciousness, and, in particular, with what sort of phenomenal consciousness comes together with a perdurantist metaphysics. Reflecting on these questions shall allow us to single out an argument to the conclusion that Temporalism and the A-theory

A natural way of raising questions about phenomenal consciousness is in terms of *what feels like being a certain entity* – this way of putting things famously tracks back to Nagel (1974). At a first approximation, a question can be raised about what feels like living in a perdurantist world.

Working Question: What does it feel like living in a perdurantist world?

Since perdurantism populates reality both with stages and worms, this question naturally splits in two interlaced sub-questions.

Q1: What does it feel like being a stage?

Q2: What does it feel like being a perduring worm?

I will engage with both these questions. However, my main focus will be on the second. I take the second question to be the most interesting since perdurantism identifies entities like us – that is, persons – with worms.[133] As an ultimate result, I shall show that an argument can be built to the conclusion that, in the B-theory of time, Perdurantism fails to achieve a plausible picture of consciousness. And, as we will see this shall give some kind of support to Temporalism.

5.3   The Individualizing Strategy

There is a *prima facie* attractive strategy – which I label *Individualizing Strategy*, and which has been defended, e.g., by Skow (2015), Prosser (2015) and Torrengo (2024) – to address these questions. It prescribes to read Q1 and Q2 in light of the following theses:

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[133] Notably, although I shall not delve into this matter, assessing what it feels like being a worm will shed light also on what it feels like being a vastly extended, non-maximal aggregate of temporal parts which fails to classify as a person in the strict sense – what Johnston (2017) calls 'personites'.

Individualized Questions: Q1 and Q2 are about specific stages and worms.

Token Experiences: Q1 and Q2 are about the token experiences of specific stages and worms.

The questions can then be phrased as follows:

IQ1: What token experiences does S have?

IQ2: What token experiences does W have?

The Individualizing Strategy further prescribes the following recipe to appropriately tackle them:

IQ1 Simpliciter: IQ1 does not need to be relativized to times.

IQ2 Relativization: IQ2 should be relativized to times.

Stages Consciousness: Stages have familiar token experiences.

The first two theses prescribe a way to tackle IQ1 and IQ2. These theses are licensed by uncontroversial considerations on property instantiation in a perdurantist setting. Since stages instantiate monadic properties, it is natural to interpret IQ1 as a question which does not need to be relativized to times. By contrast, since worms have different temporal parts located at different times, it is natural to interpret IQ2 as a question which needs to be relativized to times.

At this point Stage Consciousness enters the picture. If it is assumed that stages have familiar token experiences there is a quite obvious way to answer IQ1. One just needs to look at what experience stage S has. For instance, on the assumption that stage S belongs to Caesar and exists at instant *n* in 48 BC, it turns out that stage S has experiences as of crossing the Rubicon. In turn, when Stage Consciousness is combined with IQ2 Relativization, a ready answer to IQ2 suggests itself. To answer IQ2, one needs to establish what token experiences W has *at a given time*, say t. On the assumption that W is identical to Caesar and that the time at stake in IQ2 is again instant in in 48 BC, then, to answer IQ2, one just needs to look at what experiences has stage S – which are again experiences as of crossing the Rubicon. This comes with the welcome implication that Caesar has, at an instant in 48 BC, experiences as of crossing the Rubicon.

The Individualizing Strategy provides a seemingly neat answer to Q1 and Q2. Some philosophers, however, disagree with the idea that IQ2 should be relativized to times – see Balashov (2015, 2018). As a matter of fact these philosophers believe that, exactly because worms have experiences *simpliciter* and not in a time-relative fashion, the relation between consciousness and perdurantism is much more problematic than the strategy assumes and in fact perdurantism meets some problems with phenomenal consciousness.[134] Although I won't challenge the assumption that IQ2 has to be relativized to times, what I shall say below is very much in the spirit of the arguments developed by those that are dissatisfied with the Individualizing Strategy.

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[134] Balashov (2005, 2015, 2018) and Parsons (2015) think that these considerations support the *stage theory of persistence*. Skow discusses sympathetically these arguments in his (2011), but then rejects them in his (2015). As it will turn out, I side with Balashov and Parsons more than with Skow. Earlier instances of the arguments at stake in this paper can be found in Ferré (1972), Hoy (1978) and Hestevold (1990). Rosenkranz (2007) develops arguments which interestingly overlap with mine, although he puts them in a different way and is in the first place concerned with a comparison between perdurantism and endurantism. See also Prosser (2015) and Spolaore & Torrengo (2019) for a critical discussion.

5.4   Against the Individualizing Strategy

A distinction can be made between *types of consciousness* and token experiences. On the one hand, a type of consciousness is the consciousness which is in general associated with a given class of conscious entities. On the other hand, token experiences are the specific instances of a type of consciousness. For instance, I have a type of phenomenal consciousness which is susceptible of including visual experiences, and I do in fact have token experiences of this sort.

Notably, types of consciousness are different from what is sometimes called a phenomenal type. Phenomenal types are a general category of experiences of which token experiences are instance. So for example, an experience of vivid redness is an instance of a more general phenomenal type of phenomenal redness. Types of consciousness, by contrast, are intended to capture in the most general sense the consciousness which is associated with a given category of entities. They describe the general and most distinctive features of the *conscious life* had by a subject – the features underlying any phenomenal type and token instantiated by such subject.

The conceptual space for conceiving types of consciousness is wide. A distinction can be made between *the ordinary* type of phenomenal consciousness – the familiar type of consciousness which persons have – and *deviant* types of phenomenal consciousness – non-ordinary types of consciousness which persons don't have but that other conscious entities might conceivably have. The consideration of conceivable types of consciousness is helpful in many respects. First it is helpful for characterizing the mental states of possibly conscious animals – see, for instance, Carls-Diamante (2017, 2022) and van Woerkum (2020) for a discussion of how the consciousness of octopuses might be like. Second, it is helpful for characterizing the mental states of human beings whose nervous systems have been severed in some way – see, e.g.

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Bayne (2010). Third, it is helpful for speculating about the consciousness of theoretical entities which, albeit possibly non-actual and possibly non-conscious, are entities whose existence and consciousness is subject to consideration and scrutiny, such as an omnipotent entity like God – see Zagzebski (2008, 2024) –, group agents like United States – see Schwitzgebel (2015) –, or sophisticated instances of artificial intelligence – see Dainton (2016).

It is tempting to read Q1 and Q2 as questions which are in the first place concerned with the type of consciousness which is associated to stages and worms. Q1 and Q2 can be phrased as *categorial questions* – questions which are in general concerned with the type of consciousness associated to the metaphysical categories of stages and worms:

CQ1: What type of consciousness (if any) do stages have?

CQ2: What type of consciousness (if any) do worms have?

This reading of Q1 and Q2 is saliently different from that presupposed by the Individualizing strategy in that (i) it does not take Q1 and Q2 as questions concerned with specific stages and worms and (ii) is not concerned with specific token experiences. Of course, it would be implausible to expect friends of the Individualized Strategy to reject types of consciousness and CQ1 and CQ2 altogether. The core upshot of their view can be interpreted as the claim that the best entry point to the issue of how perdurantism and consciousness relate are individualized questions of the sort considered above. I now want to challenge this claim.

A first problem is about *who* is conscious in a perdurantist setting. The Individualizing Strategy is clear in assuming that stages are conscious but remains ambiguous on whether also worms

are conscious. All that the strategy has to say about the experiences of worms collapses into the mere consideration of the token experiences of stages. In such a way, it is not clear whether this strategy maintains that a worm is an aggregate of conscious stages which is not conscious in *itself*, or whether it maintains that a worm, besides being an aggregate of conscious stages is conscious in itself. Note that in both cases, it is possible to describe an aggregate as having different experiences relative to different stages.[135] Consider an analogy. A football team certainly includes many conscious members. It could be said that, relative to different players, the football team has different experiences. Still it is overwhelmingly natural to say that a football team, while being perhaps an aggregate of conscious parts, is not conscious in itself – there is nothing that feels like being AC Milan. The Individualized Strategy is not clear on whether worms are like football teams or like proper conscious aggregates. However, it is of crucial importance to distinguish between views which maintain that worms are conscious in themselves, and views which maintain that only stages have some experience. While the former views grasp the fact that what perdurantism identifies with persons –worms – is conscious, the latter views fail to account for this basic and crucial fact.[136]

A second problem is about the consciousness of worms. The Individualized strategy not only is ambiguous on whether or not worms are conscious, it is also elusive on the problem of *how* worms are conscious. That is, it does not address the problem of what type of consciousness worms have. Even if it is granted that stages have an ordinary consciousness and is conceded that worms are conscious, there still is a question about what sort of consciousness worms have.

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[135] I believe that this fact is partly responsible for the scarce sensibility that perdurantists showed so far with respect to the issues discussed here. A statement like 'Worm W is conscious' is ambiguous between 'W is conscious in itself' and 'W has conscious parts'. Since perdurantists postulate that worms have conscious parts, the latter statement is obviously true in a perdurantist setting. My suspect is that perdurantist have been too quick in assuming that this fact alone was sufficient for developing an acceptable picture of consciousness. However, it is obviously insufficient, for what perdurantists should be interested in is whether worms, and not just their parts, have some consciousness.

[136] Chisholm touches upon this point too (1976: 104).

Friends of the Individualized Strategy seem to work with the presupposition that the fact that stages have the familiar token experiences had by persons is sufficient to make it sure that worms have the same type of consciousness of persons as well. Such presupposition, however, is at the very least not obvious. Worms and stages, albeit linked by the intimacy of a parthood relation, are different entities. A number of metaphysical features separates them. The suspicion that, if both conscious, they might be conscious in different ways, is at the very least legitimate, and should be openly addressed rather than sidestepped. To put it another way: not only perdurantists have to make sure that their account places the ordinary consciousness had by persons into reality, they also have to make it sure that the bearers of such consciousness are what on their view is identified with persons – worms.

An analogy may be useful to conclusively appreciate the inadequacy of the Individualized Strategy. In recent years some discussion revolved around the consciousness of group agents. In particular, some have addressed the question of whether group agents like United States are phenomenally conscious.[137] In these cases nothing like the Individualized Strategy has been applied. However, in principle something like the Individualized Strategy could be applied. For instance, one could maintain that the question of what feels like being the United States (if anything) should be relativized to some of the human agents which in fact constitute United States. So, for instance, relative to Donald Trump, United States, at a given stage of their history, would has token experiences as of being in Florida, and relative to Joe Biden token experiences as of being in Washington. However, a strategy of this sort is hardly recommendable (and in fact has not been pursued). Rather than clarifying the matter establishing whether United States does in fact have some (presumably unfamiliar) type of

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[137] See Schwitzgebel for arguments that United States are phenomenally conscious (2015) and List (2018) for a rebuttal of them.

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consciousness, this strategy just eludes the heart of the problem, and collapses on a mere investigation of the token experiences which are had by some of the members of the United States.

5.5   The Categorial Strategy

There is a better strategy – which I label *Categorial Strategy* – that starts from categorial questions right away. The Categorial Strategy assumes the following theses:

Categorial Questions: Q1 and Q2 are about worms and stages in general.

Types of Consciousness: Q1 and Q2 are categorial questions about the type of consciousness, if any, had by worms and stages in general.

While the Individualizing Strategy provides a detailed recipe for addressing the questions, the Categorial Strategy does not. The Categorial Strategy does not prescribe any specific reading to the questions at stake. Relativizing CQ1 and, most notably, CQ2 to times does not make any difference when it comes to providing an answer to the questions at stake:

Invariance: It doesn't matter whether Q2 and Q1 are relativized to times or not.

This bit is particularly important. As mentioned earlier, some argued that the relation between consciousness and perdurantism is problematic by appealing to the idea that worms have experiences simpliciter, as opposed to in a time-relative way. The categorial strategy will make it clear that the relation between perdurantism and consciousness is in fact fraught and full of interesting and unexpected complications, without relying on any analogous assumption.

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Invariance is supported by the uncontroversial assumption that types of consciousness are eternally had by their bearers. Let me take a little detour to illustrate this.

Consider the case of persons. There are competing approaches for characterizing the consciousness of person. Approaches like *snapshots views*, *retentionalism* and *extensionalism* provide opposite metaphysical stories about this.[138] Sticking to a rough and schematic characterization of an otherwise intricate debate, by snapshotist lights, we have a type of consciousness which is in no way temporally extended, by retentionalist lights we have a type of consciousness which represents temporal extension but is not in itself temporally extended, and by extensionalist lights we have a type of consciousness which is in itself temporally extended. While these views disagree on the metaphysical nature of the ordinary consciousness, they don't disagree on the fact that, whatever type of consciousness persons have, they always have it. There is widespread consensus, for instance, that, if a person has a retentionalist type of consciousness, it always has it: it cannot be that sometimes it has it and sometimes it has another type of consciousness, e.g. an extensionalist type of consciousness.

This is scarcely surprising. Working with the assumption that persons have a type of consciousness subject to temporal variation is implausible to say the least. Consider a view according to which persons can have, for instance, both instances of a retentionalist and extensionalist type of consciousness at different times. Let alone that it presupposes that both retentionalism and extensionalism are actual,[139] this view would come with the implication that an entity is subject to token experiences which are of an entirely different type and which

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[138] See Dainton (2017) for an overview of this debate.
[139] And that's *prima facie* problematic as views about temporal consciousness are intended to provide *necessary* truths about the consciousness of persons, e.g. that persons necessarily have a retentionalist consciousness.

thereby differ in some of their crucial phenomenal features.[140] And this is simply unacceptable since, as the advocates of the views at stake acknowledge, the type of consciousness had by persons presents features which are constant across times and across its temporally variegated tokens.

Provided that persons always have the type of consciousness that they have, Invariance gains sufficient motivation. It is thereby apparent that relativizing the question at stake does not play any special role. This is especially relevant in the case of CQ2. While relativizing IQ2 to times allowed friends of the Individualizing Strategy to get a seemingly ready answer, the same does not apply to CQ2. One may interpret CQ2 in time-relative terms, and so take it to ask what type of consciousness worms have at a given time, or one can be happy to interpret it in non-relative terms and take it to ask what type of consciousness worms have *simpliciter*. In both cases the goal is shedding light on the nature of such type of consciousness, which, as we will see, is not a trivial and uninteresting task.

5.6 The Landscape

Equipped with this background clarifications, we are now in a position to fully appreciate the spectrum of possibilities concerning perdurantism and phenomenal consciousness.

	Stages	Worm	Consciousness of the Stages	Consciousness of the worm
Perdurantism I	C	C	O	O
Perdurantism II	C	C	O	D
Perdurantism III	C	C	D	O

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[140] Of course, the advocates of these views claim that their own respective view as opposed to the others describes a consciousness with the *right* features.

Perdurantism IV	C	C	D	D
Perdurantism V	C	NC	O	/
Perdurantism VI	C	NC	D	/
Perdurantism VII	NC	C	/	O
Perdurantism VIII	NC	C	/	D
Perdurantism IX	NC	NC	/	/

C = conscious, NC = not conscious, O = Ordinary Consciousness, D = Deviant Consciousness

Clearly, not all these options are tenable for perdurantists. Since perdurantism identifies persons with worms any view which denies either that person-worms are conscious or that person-worms have the ordinary type of consciousness had by persons is untenable. This reduces the relevant possibilities to *Perdurantism I*, *Perdurantism III* and *Perdurantism VII*. Perdurantists must maintain that one of these three is the case.

5.7   Suspicions

I shall now investigate what consciousness stages and worms have. It is heuristically useful to start by saying something on the way in which the consciousness of worms and stages might fail to be ordinary.

It can be suspected that stages, for the fact of being instantaneous, cannot have a type of consciousness which has room for experiences of *qualitative change*[141] – see Chisholm (1971) and Smith (2010) for a defence of this.

> **Stages Suspicion:** Stages have a type of consciousness which has no room for qualitative change.

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[141] Butterfield (2005) urges that temporal parts cannot at all be instantaneous.

In particular, one may speculate that stages have *static snapshots* of experiences which are, for instance, not capable of including experiences of listening to a piece of music – see Smith (2010: 31).

There are different strategies to cope with this worry.[142] One can insist that instantaneous stages, if appropriately embedded into a series of interconnected stages, are capable of having experiences which seem to require temporal extension – Hawley (2003) sketches a strategy of this sort. Or one can concede that stages have a deviant type of consciousness but maintain that briefly *extended chunks* of stages have an ordinary type of consciousness – see Perovic (2018) for a discussion of this. Alternatively, one can presumably deny that instantaneous stages are conscious altogether and hold that only the consciousness had by briefly extended chunks of stages is ordinary. Finally, one can maintain that the bearers of the ordinary consciousness are extended through time but deny that they are chunks of stages, by holding that they are briefly *extended simples* which lack temporal parts.

These strategies are interlaced with different stances on the nature of our basic acts of awareness and their adoption at least partly turns on what of snapshotist, retentionalist and extensionalist approaches one endorses. Furthermore, each of these accounts will probably need to say something on how the physical correlates of consciousness should be specifically understood, and various results in this field of study will presumably affect the plausibility and the attractiveness of these accounts.[143]For example, if the physical correlates underlying

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[142] Friends of DW must avail themselves with one of these strategies because, given that they postulate three-dimensional stages, face the same problem. I think the most natural solution for them is maintaining that instantaneous stages can be conscious.

[143] There is no widespread consensus on the what the ultimate nature of physical correlates is. See List (2018) for an exhaustive overview of various views on this.

ordinary consciousness turn out to be briefly temporally extended in all their instances, then one can suspect that instantaneous stages, no matter if embedded into a series of interconnected stages, are just not long enough for being ordinarily conscious.[144]

This being said, I shall not attempt an assessment of the prospects of these accounts. I limit myself to note that these accounts naturally fit into the spectrum of possibilities introduced in Section 5.6. Friends of Perdurantism I, II and V, since they need to maintain that stages have the ordinary type of consciousness, should probably be attracted by the first strategy considered above. Friends of Perdurantism III, IV, VI, VII, VIII and IX by contrast, since they are open to the ideas that instantaneous stages can fail to have the ordinary consciousness or even not being conscious at all, can avail themselves with the other three strategies, maintaining that only briefly extended chunks, or briefly extended simples, have the ordinary type of consciousness. I shall henceforth resort to the label of 'short-lived entities' in order to refer to the conscious entities of which worms are made without presupposing a specific stance on whether short-lived entities are instantaneous stages, chunks, or extended simples.

Also in the case of worms there is a natural intuition about how their consciousness might be deviant. It can be suspected that worms, for the fact of being extended through a long interval of time, cannot have a type of consciousness which spans over an instant (or, at most, briefly extended interval) or time:[145]

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[144] But see Builes & Impagnatiello (2025a) for a rebuttal of this reasoning and for arguments on behalf of the view that consciousness can be instantaneous.

[145] Obviously, a similar suspicion does not apply to short-lived entities for they are located at a short-lived portions of time: their location, and the physical correlates underlying their consciousness make for a restriction of the span of their consciousness at a short-lived portion of time.

Worms Suspicion: Worms have a type of consciousness which does not span over an appropriately small portion of time.

Josh Parsons provides a paradigmatic instance of this reasoning:

> […] my experience, right now, is as of a single time. Perhaps an instant, or perhaps a time with a short duration, but certainly not the *whole of my life*. As I sit here writing this article, what seems real to me in experience is my desk, my computer, my surroundings now. My birth, my death and the events that will take place in my life in an hours' time are *not* part of my experience. It just seems to me as though I experience the world from the position of a stage, not of a worm.
>
> [2015: 238. Emphasis mine]

Philip Goff shares this reasoning and presses it a bit further, by more explicitly claiming that worms, if conscious at all, are subject to an unfamiliar macro-experience which comprises the experiences of an entire lifetime.

> […] according to perdurantism, I am a four-dimensional spacetime worm, stretched out over (I hope!) seventy or so years of time. That Goff-like […] worm is certainly not having [ordinary experiences]; if it is conscious at all it is having some type of weird consciousness involving all of the experiences of my life.
>
> [2019: 269]

I think that Parsons' and Goff's remarks grasp something deep about perdurantism and phenomenal consciousness. In particular, I believe that the suspicion at stake can be further

elaborated and converted in a full-fledged argument to the conclusion that, in the B-theory of time, worms fail to have an ordinary consciousness. I shall now articulate and defend such argument.

5.8   The Argument from Sharing

Let's focus again on the relation of sharing. Sharing grasps the fact that the properties instantiated by stages are in some sense reflected in those of the worm. It is now crucial to observe that, in a standard perdurantist setting presupposing the B-theory of time – all the short-lived parts of a worm are involved in the Sharing relation.

Sharing Maximality: All short-lived parts partake in Sharing.

Every short-lived entity has equal say, so to speak, on the properties that a worm instantiates. If Sharing is characterized in terms of supervenience, for instance, each short-lived entity has a place in the supervenience base of the properties which are derivatively instantiated by the worm. Something analogous applies if Sharing is characterized in other terms, for example in grounding terms: all short-lived parts have a place in the set of grounding facts which grounds the properties instantiated by the worm. Sharing Maximality provides the grounds for a consciousness-based argument against perdurantism which I call the *Argument from Sharing*.

The Argument from Sharing goes as follows:

(1) All short-lived entities partake in Sharing.

(2) If 1), then the type of consciousness resulting from Sharing is made of many equally real temporally distributed sets of experiences.

(3) A type of consciousness made of many equally real temporally distributed sets of experiences fails to be ordinary for it fails to have an appropriately short temporal span.

(4) Worms have the type of consciousness that results from Sharing.

(C) Worms have a consciousness which fails to be ordinary.

(1) is reflection of the B-theory of time. Within the B-Theory Sharing is an eternal phenomenon and each and every temporal part permanently partakes in it. Temporalists are in a position to reject Sharing Maximality for claiming that only one temporal part temporarily partakes to the sharing relation. This allows to reject premise (1) and eludes the Argument. But that requires dropping the B-theory's essential commitment to Propositional Eternalism.

Premise (2) is an implication of perdurantism. Since worms have many conscious temporal parts and since all these parts partake in Sharing, their consciousness is made by the sets of experiences of all those parts. Those sets of experiences are temporally distributed (or 'temporally localized' as I shall occasionally say below) in the sense that each of them is brought about by physical correlates located at the short-lived portion of time which is occupied by a short-lived part which has it in the first place.

Against (2), some may insist that the consciousness of the worm is constituted of different sets of experiences *at different times*, in a such a way that what set of experiences make up the

consciousness of the worm is subject to temporal variation. But this rebuttal does not survive scrutiny as it misinterprets how Sharing works in a standard perdurantist setting. To appreciate this, let's reflect again on the B-theory of time. In such a setting, temporal parts eternally instantiate their properties. It is, for instance, always true that a given part instantiates the property of being bent. Since they instantiate eternally their properties, and since they are eternally part of the worms that they compose, short-lived parts eternally partake in Sharing. But, if short-lived parts eternally partake in Sharing, then it follows that it is an eternal fact that the properties of the worm in some way encompass the multiple properties of their short-lived parts. As a consequence, the fact that the consciousness of the worm is made by the temporally distributed sets of experiences of each of its parts is immune to any temporal variation and always obtains. The case of consciousness is not special. More familiar properties like location and shape behave in a similar way. Thanks to Sharing, a worm has a life-long location, eternally made out of the short-lived locations of its parts. And, thanks to Sharing, a worm has a shape which is eternally made out of the shape of its parts, e.g. a shape which is bent at t and straight at t^1. More formally, a worm eternally instantiates a huge variety of *time-indexed* properties which are grounded in the possession of temporal parts. This results in a familiar picture, where talk of a worm having properties at different times is allowed and makes sense. But such talk is in no way incompatible with the observation that a worm has many properties which are eternally built out of a variety of short-lived properties.

Premise (3) states something which in my mind has huge traction. On the one hand, it is plausible to assume that the temporal spanning of a consciousness depends on the temporal distribution of the elements out of which such consciousness is made, so that to a greater distribution of the elements corresponds a greater extension of the span. This yields the result that the consciousness had by worms, since it has many temporally distributed elements, cannot

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have an appropriately short span. As a consequence, the view that the consciousness of the worms has an appropriately short span can be endorsed only at the cost of assuming an implausible stance on how the spanning and the distribution of the elements of a consciousness relate. On the other hand, views like snapshotism, retentionalism, and extensionalism – which, again, are intended to account for the fact that human consciousness spans over a brief portion of time – all agree on the fact that the elements of an ordinary consciousness are either simultaneous or distributed across an extremely brief interval of time.[146] This yields the result that the consciousness of worms, since it has many elements distributed across a life-long interval, can hardly correspond to a snapshotist, retentionalist, or extensionalist consciousness. But, since these views constitute the main options currently on the market for accounting for the consciousness had by persons, it remains at the very least unclear in what way the consciousness of a worm might be ordinary after all.

This latter point is additionally important. Not only it suggests that it remains mysterious what ordinary consciousness a worm might have, it also suggests that, since it is surely not a snapshotist, retentionalist, or extensionalist consciousness, it cannot be ordinary at all. Remember that it is viable for perdurantists to maintain that short-lived entities have an ordinary consciousness of the sort envisaged by these traditional views. Now, if this is granted and is assumed that short-lived entities have the consciousness that worms have, say, for example, in virtue of having a retentionalist consciousness, then there is a quite straightforward argument to the conclusion that worms cannot have an ordinary consciousness. Presumably,

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[146] I am here staying neutral on what is the nature of the relation which brings the elements together here. One can think that it is a bottom-up mereological relation and that the presence of the component parts grounds the experiential whole, or one can take the opposite route and think that it is a top-down mereological relation where the component parts are in some way abstracted away from the whole – Sattig (2025 distinguishes between *compositional* and *non-compositional* views which disagree on this, see also Philips (2014) and Grush (2016). Or, alternatively, one can rule completely out that such relation is mereological at all. This makes no difference for my claims, as they rest solely on the fact that, according to snapshotist, retentionalist, and extensionalist accounts, an ordinary consciousness embeds elements which are not distributed across an entire lifetime.

once one endorses retentionalism and claims that retentionalism describes the ordinary consciousness of persons, she will also maintain that retentionalism alone succeeds to reach this goal. That is to say, she will say that *only* a retentionalist consciousness is an ordinary one. If this is granted in the context at stake, it follows that worms cannot have an ordinary consciousness for the trivial reason that they cannot have a retentionalist consciousness. Faced with this, perdurantists may want to deny that short-lived parts have an ordinary consciousness, or they may want to deny that there is only one ordinary consciousness. In any case, each of these claims appears hugely controversial and, what is worse, motivated by the sole wish of rejecting premise (3).

Although something remains to be said about what it is for a consciousness to not span over a brief portion of time (see Section 5.9), I take it that these considerations to provide enough support to premise's (3) *negative* claim that the consciousness resulting from Sharing fails to be ordinary. Subjects presented with such consciousness fail to have a consciousness which is confined to a brief moment of time: they cannot have, for example, the experiences I am having now, which merely include my surroundings at a brief time within my whole lifetime.

This notwithstanding, premise (3) may meet some resistance. It can be argued that, even though it's true that a worm has a type of consciousness which is eternally constituted of the sets of experiences of its short-lived parts, within such consciousness there still is room for some *variation*. An analogy with some features of the properties underlying color and shape can be pressed. It can be insisted that, exactly in virtue of having a shape and a color constituted by the shape and the color of their temporally distributed short-lived entities, the color and the shape of the worm should be understood as a pattern which varies through time. It can be suggested that the same applies to the type of consciousness had by the worm. In virtue of

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being made of many sets of experiences localized at different times, the consciousness of a worm can be described as a pattern subject to variation over time, e.g. a variation from experiences of pain to experiences of joy. This contention can be presumably reinforced by adding that the sets of experiences shared with a worm, albeit all equally real, are asymmetrically ordered according to earlier and later relations (e.g. from earlier to later), in such a way that the worm does not end up having a bunch of random experiences, but rather an asymmetrically ordered sequence of them.

I should say that I struggle to see how the consciousness envisaged by this rebuttal could genuinely match our own. I concede that the consciousness of the worm exhibits a pattern subject to variation. But I maintain that such variation in no way impinges the fact that such consciousness is made by many, equally real, temporally distributed elements. Unless one wants to challenge this assumption – thereby collapsing the strategy on a rejection of premise (2) of the argument –, I cannot see how the envisaged variation could bring the appropriate sort of temporal span to the consciousness of the worm. More generally a rebuttal concerned with variation misses the point, for the feature targeted by the Argument from Sharing is concerned with the span of consciousness. Friends of this argument can happily concede that, when it comes to variation, perdurantism ascribes to worms a consciousness which exhibits a seemingly ordinary and welcome feature, but at the same time insist that, when it comes to the spanning, it does not. For similar reasons, I cannot see how the fact that the experiences are asymmetrically ordered could play any relevant role in making the consciousness at stake ordinary in the relevant sense: the fact of being ordered in no way makes for a disparity among the sets of experiences (this notwithstanding, as will be clear later on, I believe that such asymmetric ordering may play a role in establishing how the consciousness of the worm specifically fails to be ordinary).

A final and related contention against (3) is that the consciousness at stake in (3) is not non-ordinary, for the right way to interpret it is as a consciousness which simply comes in many ordinary token experiences, namely, the sets of familiar experiences which are arguably had by the short-lived parts.

I find this contention untenable for reasons which I in part I have already explained, but which for sake of clarity I shall briefly rehash here. The fact that the consciousness at stake is made by ordinary token experiences in no way rules out the possibility that the consciousness is unfamiliar and does not assure that the consciousness itself is ordinary. First, this is not supported by the implications of a perdurantist account of predication. Consider, once again, location. A worm has a location made out of the many, familiar, instant-spanning locations of its instantaneous stages. To this extent, many familiar token locations make the location of a worm. However, it would be plainly wrong to infer from this that a worm has a familiar location which simply comes in many instant-spanning instances. Rather, the worm has a less familiar, interval-spanning location which results from many familiar instant spanning locations. And, as seen above, the same goes for other kinds of properties, e.g. shape properties. There is no principled reason for which the case of consciousness should be modelled differently. To be even more explicit, even though the consciousness of the worm is made of many ordinary token experiences, it does not follow from this that the consciousness of the worm has to be ordinary as well. Second, assuming that a consciousness made of many ordinary token experiences is ordinary would be simply in contrast with what the accounts of ordinary consciousness on the market assume. Again, that an ordinary consciousness is not made by many, temporally distributed token experiences which cover an entire lifetime, but rather by elements distributed through a brief portion of time.

Premise (4) is an uncontroversial implication of perdurantism: if conscious at all, worms have a consciousness which is in some sense parasitic on the consciousness of their short-lived parts.

One way out from this argument, of course, is retracting the claim that persons are identical to perduring worms, for claiming instead that they are identical to a short-lived stage. This can be achieved by resorting to the stage theory of persistence,[147] but also by adopting a more exotic view according to which persons are identical to a short-lived entity with some temporal extension. A choice between these strategies presumably depends on what one believes about the temporal span of an ordinary consciousness – whether it is instantaneous or briefly extended. This strategy, however, is not open to perdurantists. At least, not to those perdurantists that aim at providing a perdurantist account of persons. The reason for this is simple: just because this sort of view gives up on the claim that persons are worms. Some perdurantists may be happy to retreat from this claim (although I suspect that holding that persons are strictly speaking short-lived is not something easily swallowed). Or, at least, they might be happier to retreat from this claim than from the claim that the B-theory is true, thereby endorsing some temporalist metaphysics.[148] I am ready to grant this. Still, the result that persons cannot perdure is something that goes against what perdurantists widely assumed to be in a position to claim.[149]

This argument shows that, upon reasoning on the sharing machinery underlying property instantiation, the consciousness of perduring worms fails to be ordinary. Additionally, this

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[147] See Sider (1996). In a nutshell according to the stage theory persons are, strictly speaking, identical to a short-lived stage which is counterpart-related with other short-lived stages whose presence accounts for the fact that it instantiates future- and past- directed properties.

[148] Parsons (2015) and Balashov (2015) endorse this view.

[149] And indeed this piles up with other arguments with the same conclusion, like Johnston's (2017).

argument says something about the deviant consciousness had by worms: such consciousness is deviant in that it encompasses multiple, temporally distributed, sets of experiences and thereby fails to come with an appropriately short-lived span. While the results brought about by the sharing relation and the possession of many equally real temporal parts are relatively harmless as far as ordinary properties are concerned, they turn out to be baleful once consciousness is properly taken into account.

5.9   Further Objections

The case made by the Argument from Sharing seems strong to me. This argument persuades me that it is at the very least hard to see *how* the consciousness had by worms could match the consciousness had by persons. Still there are some additional reservations and challenges that this argument has to face. I conclude by discussing them.

A first concern is about the real implications of the argument. Some may accept the conclusion of the argument and yet maintain that such conclusion misses the target as it does not affect perdurantism in any relevant sense. First, it may be postulated that there is a distinction between having a consciousness and *accessing* a consciousness, where accessing a consciousness is what matters for being presented with the distinctive character of such consciousness.[150] Then it may be argued that, even though worms in an abstract sense have a weird type of consciousness, there is no time when they access such consciousness. The leading thought behind this is that a consciousness can be accessible only at short-lived portions of time. If consciousness is accessible only at short-lived portions of time, then it turns out that the consciousness that worms access has to necessarily be of the same, arguably ordinary, type of

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[150] Balashov (2005) and (2015) and Skow (2011, 2015) appeal to the similar notion of *experiential availability* to phrase related arguments. My argument involves nothing like availability or accessibility.

that of their parts, for the consciousness localized at each short-lived portion of time within a worm's entire location is an instance of the consciousness had in the first place by its parts. Torrengo (2024) seems to have in mind something along these lines:

> The fact that as a whole a four-dimensional worm has an alien type of experience should not worry us (namely, the worm), since that experience is not accessible to us. Only the experiences of the ordinary type are accessible to us, relative to their temporal positions.
>
> [2024: 236]

I think this line of argument has little traction. Even granting that there is a difference between having and accessing a consciousness,[151] the friends of this rebuttal have no good answer to the question of *why* worm's access to consciousness should be limited to short-lived portions of time.[152]

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[151] And I don't think this is trivial, for there is no obvious definition of accessibility which doesn't make accessibility collapse on the mere possession of a consciousness. A natural candidate is defining accessibility in terms of instantiation of phenomenal properties; but it does not work. Indeed, instantiation of phenomenal properties is also a natural candidate *also* for defining what it is to have a consciousness altogether. Notably, the definition of availability envisaged by Skow (2015: ch. 12) is not helpful here, for it defines availability in terms of the mere fact of having an experience '"Experience E is available to P at T" is true if and only if P has E at T'. Torrengo agrees (2024: 230)'Accessibility is definitely not a phenomenal property; we do not 'see' that what is presented in perception is accessible to us'.

[152] Furthermore, there are also doubts about whether the fact in itself of restricting the accessibility relation to brief worms of time could really prevent the worm from accessing a weird consciousness. It can be conceived that a worm, at a brief portion of time, accesses a consciousness which is nonetheless made of many temporally distributed elements. An obvious worry about such consciousness is that it seems to imply backwards causation, in that it entails that the consciousness accessed by a worm at a brief portion of time is made of elements which exist at later times – Prosser (2015: 32) and Spolaore & Torrengo make similar remarks. However, it is by no means obvious that anything like causation should be involved here. Rather than being causally related, the elements of the consciousness at stake might be related by a composition relation akin to a mereological relation, in such a way that, at a brief-portion of time, a worm accesses an unfamiliar experiential whole made of experiential elements distributed across an entire life-time. This reasoning leads me to think that restricting accessibility to a brief time does not obviously do the trick expected by the friends of this proposal. However, since I believe that restricting accessibility to a small portion of time is in any case subject to serious objections, I shall not develop this line of reasoning further in the main text.

The answer endorsed by Torrengo appeals to causal local constraints applying to consciousness and goes as follows:[153]

> If we are focusing on the constraints on the accessibility of what gets presented to us in perception, an obvious candidate is causality. Being available for perception means being in the right causal connection with a cognitive system capable of perception, something that only certain events in the temporal series are. When the system is 'active' (a conscious and attentive person, for instance), then certain mental content rather than others will be accessible to them. In other words, that there are local accessibility constraints on a cognitive system means that the entire content of a phenomenal present depends on the conscious mental episode we are considering and the events in its proximity.
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> [*ibidem*, 230]

I think this answer does not work as far as a standard version of perdurantism is concerned. Perdurantism introduces a distinction between instantiating a property in a more primitive sense and instantiating a property derivatively. As seen at the outset of this chapter, a standard perdurantist setting comes with the theses that I labelled Temporal Parts and Sharing, whereby the properties instantiated by a worm result from those instantiated by its temporal parts. Within this picture, while what accounts for the properties instantiated by short-lived parts at each given time can be easily identified with what ordinarily accounts for the qualitative profile that a person has ay each given time, what accounts for the properties instantiated by a person ultimately are relatively technical metaphysical relations – parthood and Sharing. A

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[153] As Torrengo makes explicit (2024: 236) 'the fact that the type of experience of the whole worm is alien to us (as it is to the worm, unsurprisingly, since we are the worm) is just a consequence of the local constraints'.

consequence of this is that an accessibility regulated by causal constraints, while being surely plausible in itself for characterizing the accessibility underlying the consciousness of short-lived parts, is not an adequate candidate for characterizing the way worms access their consciousness. A worm's access to its own consciousness turns on the sharing relation.[154] Once Sharing is taken into account, it turns out that accessibility has to be analyzed in the same way in which other features of a worm are analyzed. And what emerges is that a worm stands in a temporally extended series of temporally distributed causal connections which respectively generate the accessibility relations through which a worm's parts access their own experiences. As a result, a worm stands in an accessibility relation which results from numerous short-lived accessibility relations spread out across time. That is to say, in an accessibility relation that spans over a long portion of time. Notably, within this picture the relevance that causal constrains might have in bringing about a short-lived accessibility can be recognized. Those constrains, however, only apply to short-lived parts and fade away within the sharing machinery in the way just illustrated. The role played by those constrains on a worm's accessibility is no greater than the role played on a worm's shape by the extension constrains operating on the shapes had at different times by short-lived parts.

Some perdurantist may reject the assumption that accessibility has to be modelled on the example of ordinary properties. It might be insisted that what really matters for accessibility just are causal relations, and not weird properties resulting from Sharing. This makes it sure that there is only one accessibility relation – a familiar one that provides only access to the short-lived. However, it makes also sure that there is only one class of subjects that stand in the relation – just the short-lived parts. If the claim that weird properties resulting from Sharing

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[154] Which, as noted above, is with any plausibility characterized in terms of a dependence relation such as supervenience or grounding.

play no role in accessibility is granted, in fact, it becomes hard to see how a worm can access any consciousness at all. After all, if not from the properties of its short-lived parts, where from should a worm's accessibility derive? However, if only short-lived parts have some access to their consciousness, the whole account collapses on a picture where a worm – while having a consciousness – is never presented with its distinctive phenomenal character via an accessibility relation. And this picture is no less untenable than what I called Perdurantism V, VI and IX.

Another answer is that accessibility is restricted to short-lived times for *only* short-lived times host experiences. The only localized experiences are the short-lived ones and this is why the worm accesses only short-lived experiences: there simply is no consciousness to be accessed through a long-lived accessibility. Torrengo seems to have also in mind something along these lines when he writes 'But the worm, as us, has *this* or *that* experience only relative to temporal positions. The type of temporally localised experiences that the worm has is the familiar type of the experience that we ordinarily have' (*ibidem*: 236. Original Emphasis). I find this unconvincing. As suggested already, the non-ordinary consciousness that a worm has should be conceived of as an instance of a consciousness which, rather than being familiarly localized at a short-lived time, in full analogy with a worm's shape and location, is unfamiliarly localized at a long-lived one. In the resulting picture, the worm has *that* instance of deviant consciousness *relative to a life-long temporal position*, which incidentally is the temporal position that the worm exactly occupies.[155]

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[155] It is worth noting that a restriction of accessibility to a brief portion of time might have an adequate explanation within an endurantist framework. According to endurantism, roughly, persisting entities are wholly located at many different instants of time. Crucially, enduring entities are not wholly located at an extended interval of time. In this setting, the restriction of accessibility to brief times, and particularly to instants, can be explained away by the fact that subjects in themselves are wholly present only at instants of time. Obviously, this explanation is not available to perdurantists, as they postulate that persisting entities are wholly located at life-long intervals of time. Upon accepting that restricting accessibility to small portions of time allows an acceptable picture of consciousness, this may suggest a primacy of endurantism over perdurantism. Endurantism seems resistant to the charge of ascribing an unacceptable consciousness to persisting entities in a way in which perdurantism is not.

A second and final concern about the argument I have been articulating is that it is not entirely clear how deviant the consciousness of a worm is. The Argument from Sharing concludes that the consciousness of the worm is not ordinary because it is made of many equally real sets of experience and thereby fails to span over a short-lived portion of time. What it is for a consciousness to span over a short-lived portion of time is relatively clear. Within a consciousness of this sort, a subject is directly exposed to a small portion of its own life-time. Other portions can be remembered, and others anticipated: but only a small one is part of what is presented to a subject. What it is for a consciousness not to span over a short-lived portion of time is not as clear as this. The Argument from Sharing doesn't say much about it. Parsons' and Goff's remarks, on the other hand, shed more light on it, by suggesting that it has to be a weird consciousness involving the experiences of a whole lifetime. But, in turn, they are somewhat parsimonious in describing the details of such consciousness. Some may insist that they will not be convinced that perdurantism has a problem with consciousness until they will be more precisely shown what specific deviant consciousness a worm has. The burden of shedding light on this, it can be insisted, still stays on those who charge perdurantism of an implausible picture of consciousness.

I am not entirely persuaded that the burden is on those who are willing to reject perdurantism on phenomenal grounds. In order to reject perdurantism on the grounds of a consciousness-based argument, a deductive case like the one presented above might be enough. Not always a reductio ad absurdum is needed for seeing the overall implausibility of a view, and consciousness is no exception to this. Nor do I think we should expect a fine-grained and fully

Since I believe that the relation between endurantism and consciousness deserves a separate discussion, I don't touch upon this issue in the main text.

exhaustive description of a consciousness which persons don't have to be possible. We lack introspection to such consciousness; I would be scarcely surprised if a description of it were to remain, to an extent, speculative, sketchy, or merely negative. Still, I perfectly see that providing an illuminating story on what perdurantism gets wrong with consciousness would boost the power of any consciousness-based argument against perdurantism. As it happens, I think that such story, to an extent at least, can be provided. For the time being, I shall briefly sketch it below.

There are two scenarios I can think of for making sense of the consciousness had by worms:

Scenario I:[156] A worm has a type of consciousness which fails to span over a small portion of time because it accesses the different sets of experiences inherited from its short-lived parts through the sharing relation as unified together into a unique field of consciousness.

Scenario II: A worm has a type of consciousness which fails to span over a small portion of time because it accesses the different sets of experiences inherited from its short-lived parts through the sharing relation as many, equally real, separate and disunified fields of consciousness.

Both these scenarios describe a non-ordinary type of consciousness. I don't have a conclusive case in favour of one of these scenarios. But I believe there are *prima facie* reasons for the second being more plausible.

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[156] Williams (1951: 468 and *footnote* 26) discusses something similar to this scenario.

Scenario I assumes that the sets of experiences inherited from temporal parts through the sharing relation can be unified together in an analogous way to how simultaneous experiences are unified. But this is implausible for it unduly neglects the fact that, as briefly seen in discussing premise (3), these sets are all *asymmetrically ordered* and *mutually separated*. They are asymmetrically ordered and mutually separated for short lived parts, rather than being merely included into the whole of reality, are located at temporal locations related by *earlier* and *later* relations. This fact can well be recognized even in the context of the B-theory of time[157] (although there is well-known disagreement about how to interpret the nature of temporal asymmetry[158]) and, it may be insisted, any stance on the consciousness of worms should countenance it.

These concerns don't apply to Scenario II. First, since they are not unified together, the sets of experiences accessed by the worm are obviously separated. Second, it can be plausibly thought that, rather than being assembled randomly in many disjoint fields of consciousness, they are asymmetrically ordered according to earlier and later relations. In the resulting picture, the worm ends up accessing an asymmetrically ordered sequence of experiential sets. Notably, even in this case, the consciousness of the worm fails to span over a small portion of time as each and every set of experiences is equally real and fully on a par. A worm accesses each and every portion of its experiential life as if it were exposed to the entirety of its lifetime stream. This is not how life is presented to persons for the trivial reason that the consciousness had by a person in no way includes a person's lifetime as a whole. The consciousness of a worm is somewhat reminiscent of that of a god which accesses the entirety of the mutually separated experiences had by each of its conscious creatures.[159] Much as like such god is exposed to

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[157] See Le Bihan (2020) and Spolaore & Torrengo (2019).
[158] See Price (1998) and Maudlin (2007) for different stances on it.
[159] This attribute is known as *omnisubjectivity*. See Zagzebski (2008, 2024) for a systematic discussion of it.

every bit of the worldly experiences had by its creatures, a worm is exposed to every bit of the temporally distributed and asymmetrically ordered experiences had by its temporal parts.[160]A worm is the god of its own lifetime.

5.10   Extensions: An Argument about Sharing

So far so good. If one accepts the Argument from Sharing, then she will think that the conjunction of B-theory and perdurantism is not tenable. Some other morals have been grazed throughout our discussion. For example, it emerged that there are reasons for thinking that a combination of the B-theory and a theory of persistence which identifies persons with short-lived stages is not as problematic as perdurantism. An interesting question which deserves consideration is whether the reasoning underlying the argument applies to other theories of persistence other than perdurantism.

I think it does. Indeed, the Argument from Sharing is about the sharing relation. If the B-theory is assumed in the background, it will apply to any theory which accounts for consciousness by relying on a sharing relation between momentary stages and a numerically distinct metaphysical item which is related to those stages. Perdurantism identifies such item with a mereological aggregate of stages. But there are other principled possibilities. Actually, DW relies on some assumptions about persistence which explore this possibility. Recall that DW identifies ordinary objects (including persons) with Williamsonian concretable entities. These entities in turn stand in a sharing relation with three-dimensional worldly stages analogous to those postulated by perdurantism. This stance of persistence, if developed outside Temporalism, is subject to a version of the Argument from Sharing. Such version of the

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[160] With the obvious caveat that, while God does it for it is omnipotent, a worm does it for each and every temporal part partakes to Sharing.

argument is just identical to the argument developed against perdurantism, but of course substitutes talk of worms with talk of concretables.

(1) All short-lived entities partake in Sharing.

(2) If 1), then the type of consciousness resulting from Sharing is made of many equally real temporally distributed sets of experiences.

(3) A type of consciousness made of many equally real temporally distributed sets of experiences fails to be ordinary for it fails to have an appropriately short temporal span.

(4) Concretables have the type of consciousness that results from Sharing.

(5) Concretables have a consciousness which fails to be ordinary.

Of course, perdurantism is the chief instance of a theory of persistence relying on a sharing relation and so the version of the argument possessing the greater traction is the one deployed against it. But reflecting on the version of the argument at stake in this section is important, as it allows to clarify that, even if one endorses the peculiar stance on persistence required by DW, she will be compelled by the arguments that I have been defending about how sharing and consciousness relate.

5.11   Morals: A Conditional Argument for Temporalism and DW

The Argument from Sharing allows to defend a more general argument in favor of Temporalism, the *Argument from Types of Consciousness*.

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(1) Within a perdurantist B-Theory, persons don't have a type of consciousness with an appropriately short span.

(2) Persons have a type of consciousness with an appropriately short span.

(3) Theories able to account for the fact that persons have a consciousness with an appropriately short span should be preferred to the perdurantist B-theory.

(4) Temporalist theories are able to account the fact that persons have a consciousness with an appropriately short span.

(5) Temporalist theories should be preferred to the perdurantist B-theory.

(1) is supported by the Argument from Sharing. (2) Is an uncontroversial premise in the sense elucidated above. (3) Is a plausible assumption about what we should expect from a theory of time. (4) is supported by the fact that, as seen above, temporalist theories are in a position to elude premise (1) of the Argument from Sharing: they can claim that only one temporal part temporarily partakes to sharing.

So, here's the promised argument for Temporalism. As announced at the outset, there are caveats. First, this argument might not support only Temporalism. Again, a B-theory combined with the stage theory of persistence,[161] for example, is in the number of those theories that can account for the fact that persons have a short-lived consciousness. Thus the support this

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[161] Or perhaps even with endurantism, see *footnote* 155.

argument lends to Temporalism is conditional on ruling combinations of this sort out. Second, this argument does not support DW in any particular way. Any Temporalist theory has some experiential primacy over the perdurantist B-theory. Thus, DW does not have a special primacy here, though it could be preferred to its competing temporalist theories for other reasons, e.g. being immune to the Epistemic Objection and to the Objection from Spacetime.

In sum, the reasoning exposed in this chapter can lead to DW, but doesn't have to. Here's how it led to DW in my peculiar and idiosyncratic case. I am inclined towards theories of persistence built around the postulation of short-lived stages. And I am inclined towards respecting the intuition that I am not strictly speaking identical to a short-lived stage. This ruled out combinations of the B-theory with (most versions of) endurantism and with the stage theory. I am also persuaded by the Argument from Sharing. This ruled out a perdurantist B-theory. So I was left with temporalist theories. But, like many temporalists, I was also impressed by the Objection from Spacetime. Dorr's and Bacon's approach brought some freshness about in my thinking. Then I developed a theory in the spirit of theirs. Sometimes I think about the systematic lack of synchronicity entailed by DW and I wonder whether my intuitions in favor of being synchronized with the people around me are any stronger than my intuitions against being a short-lived stage. But most of the times they seem not to be and then I accept to live out of sync.

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