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Parts of Persons

Identity and persistence in a perdurantist world

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Introduction

My doctoral research aims at providing a better understanding of the metaphysical structure of personal identity and persistence. I will deal with the following questions: How do we persist over time? What (if anything) makes us identical from one time to another? Personal persistence is an essential issue for many fundamental normative questions, concerning for instance what makes a person morally responsible for a past action or when somebody is justified in having a special prudential concern for one particular future person. Still, when I talk about the main topic of my research, my feelings are very similar to the ones described once by Dennett, who claimed as follows:

“When I go to a party and people ask me what I do, and I say, “I’m a professor”, their eyes glaze over. When I go to an academic cocktail party, and there are all the professors around, they ask me what field I’m in, and I say, “philosophy” – their eyes glaze over. When I go to a philosopher’s party, and they ask me what I work on and I say, “consciousness” their eyes don’t glaze over – their lips curl into a snarl And I get hoots of derision and cackles and growls because they think, “That’s impossible! You can’t explain consciousness.” The very chutzpah of somebody thinking that you could explain consciousness is just out of the question [...] And the reason for that is that everybody feels like an expert on consciousness.”¹

Setting aside the fact that I am not a professor, and a greenhorn compared to Dennett (to say nothing on the fact that we probably go to different parties), well, this is exactly what happens to me when I introduce the topic of my research: everybody is an expert on personal identity and personal persistence and everybody has a strong opinion about these issues. I think that there are two main reasons that explain this situation. The first one is that despite its intuitiveness, the problem of personal identity is rather confused, so that it needs to be framed in a clear way in order to be analyzed. Secondly, it involves a lot of different issues which may be not easy to handle. In response to that, on the one hand I will refer to the standard formulation of the problem of personal persistence discussed in analytic philosophy, by dealing with the constitutive conditions of personal persistence (cf. section 1.1.). On the other hand, rather than taking on the “big picture” task of providing an analysis of personal identity *tout court*, I will focus on developing a perdurantist account of personal persistence over time, according to which persons are objects that extend through time in a way which is similar to the way they extend through space, that is to say in virtue of having different parts at different space-time regions (see section 1.3.). This account is both in contrast with what people usually take as the standard endurantist approach – according to which material

¹ Daniel Dennett “On our consciousness”, Ted talk 2003. (https://www.ted.com/talks/dan_dennett_on_our_consciousness)

entities are three-dimensional objects that exist entirely at several times – and the revisionary stage view – which conceives material entities are nothing but instantaneous things, coming into existence and then disappearing right after.

Since I hope to argue for a perdurantist account of persistence over time, which is not very popular in the contemporary debate, my work should contain both a constructive and a destructive project. The constructive project consists in defending an ontology of temporal parts, and then the idea that persons persist in virtue of such parts (cf. chapter 1), whereas the destructive project consists in the rejection of extreme (and mainstream) views on the diachronic composition of temporal parts, namely nihilism and universalism. I will hence explore some new perdurantist views, by arguing for the priority of perdurant wholes over their temporal parts (chapter 2), and then for a moderate approach to diachronic composition of temporal parts into perdurant persons. To keep my work manageable, I emphasize that my discussion is restricted to persons (although some considerations may be extended to material objects in general).

Let me remark that in most of my work I am going to be making a controversial assumption about material objects, namely that they are four-dimensional entities that are extended over time. I assume that four-dimensionalism is true, and I oppose this view to the view that things are three-dimensional objects which continue in time. I will mention two facts by way of justifying my making this assumption: a) I believe that four-dimensionalism is true; b) I cannot do everything in my work. I am willing to defend the four-dimensionalist conception of material objects against the criticisms of three-dimensionalists, but to do so is not my project here. Anyone who accepts three-dimensionalism, or takes this doctrine seriously, may regard my work as having a conclusion that is conditional in form: “If objects are in 4D, then diachronic composition of temporal parts into persons must have such-and-such features”. Some three-dimensionalists may in fact be extremely pleased with my conditional conclusion when they have seen its consequent. Besides that, I am also assuming that i) persons are material entities, i.e. entities occupying space-time regions; and that ii) material entities as you and I exist and persist (although some may deny that, strictly speaking, persons persist through time – cf. (Unger 1990)). I justify my making these assumptions on grounds similar to those on which I have justified the four-dimensionalism assumption about material objects.

As far as the methodology is concerned, let me point out that my work is speculative: I reach my conclusions only, or almost only, by means of apriori reasoning, rather than on the basis of empirical research. This does not mean, however, that my conclusions are in contrast with the results of our best scientific theories. By dealing with metaphysical issue, a further methodological question concerns the famous distinction introduced by (P. F. Strawson 1959) between *descriptive* and *prescriptive* metaphysics. Is my proposal an instance of descriptive or prescriptive metaphysics? Given that I defend a perdurantist account of personal persistence, I doubt my position may be understood as descriptive: I will argue that temporal parts are not elements of our pre-theoretical world, as we do

not experience things as persisting in virtue of having temporal parts. However, I doubt that my position may just be characterized as prescriptive either, for I'm not prescribing what conceptual scheme we should have (which is the way scientific theories are prescriptive), nor I'm offering solutions that make the problems disappear in a reductionist way².

With all this in mind, it is time to start with the first chapter: "Personal identity and persistence".

² It is interesting to see that this perspective is rather diffused among contemporary analytic metaphysicians, who "follow the descriptive metaphysician in taking ordinary belief about metaphysical matters seriously, but follow the prescriptive metaphysician in aspiring to more than autobiography" (Sider 2001a, xiv). For a defense of metaphysical inquiry as an a priori and highly speculative field, see (Sider 2001, xv).

CHAPTER 1. Personal identity and persistence

1.1. The persistence of persons and the criteria of identity over time

Personal persistence is an old problem, and philosophers have been dealing with it for a very long time, advancing solutions which often turn us to a drastic reconsideration of our commonsense intuitions.¹ Take for instance Locke, who thoroughly discussed the problem of personal persistence in the *Essay Concerning Human Understanding*, and offered an account of personal persistence based on our psychological features. Or Hume, who advanced a revisionist account of persistence in the *Treatise of Human Nature*, according to which personal persistence is nothing but a fiction.

Nonetheless, it is in the last decades (starting especially during the Seventies of the previous Century) that personal persistence has been receiving a great deal of attention by analytic metaphysicians, whose main contribution has consisted in dealing with the problem of personal persistence by focusing on the *criteria of identity over time*. A criterion of identity over time is not just a standard by which identity over time might be judged; it is the *ontological and constitutive condition* of such an identity². In other words, a criterion of personal identity over time can be defined as the completion Φ of the following schema.

- (1) Let x be an entity that exists at time t^1 and y an entity that exists at t^2 [where i) $t^1 \neq t^2$ and ii) $Px \vee Py$]. Necessarily, $x = y$ if and only if $\Phi(x,y)$.

Provided that '=' stands for the relation of *numerical identity*³, P stands for the property of *being a person*, and ' Φ ' stands for the *constitutive condition* whereby the identity of x and y is determined⁴.

¹ The first two introductory paragraphs are almost *verbatim* of what I say in (Buonomo 2018).

² As Sattig put it, "[...] to say that there is an informative criterion of diachronic identity is to say that facts of diachronic identity covary with facts about continuants' instantaneous qualitative profiles as well as cross-temporal relations between these profiles" (Sattig 2008, 180).

³ Two things are "qualitatively identical" if they share the same properties (e.g. two identical mugs), whereas they are "numerically identical" if they are *one thing*, and not two (e.g. the mug that I have in front of me). More generally, we can say that two things are qualitatively identical if and only if they exactly resemble each other, whereas they are numerically identical if they are one and the same thing.

⁴ This is in line with the more general schema that characterizes a criterion of diachronic identity for Ks advanced by (Sattig 2008, 180-1), namely "Necessarily, a continuant x of a kind K that exists at t_1 is identical to a continuant y that exists at t_2 iff x -at- t_1 stands in the I-relation for Ks to y -at- t_2 [...] Any criterion of diachronic identity for Ks will thus be a relation that plays the role of I-relation for Ks [...]"

A criterion of identity should be thought as the conjunction of a necessary and a sufficient condition for identity over time, for the formula above maintains that x and y are the same thing *if* Φ (i.e., $\Phi \rightarrow x=y$: sufficient condition) and *only if* Φ (i.e. $x=y \rightarrow \Phi$: necessary condition). In addition to being necessary and sufficient, any constitutive conditions of identity over time should also be informative. Informativity is a further essential feature of any criteria of personal persistence. A condition of identity Φ is informative if it is at the same time non-trivial (i.e. having a different meaning from, or at least not being logically equivalent to, the identity it constitutes), non-redundant (i.e. it should be logically possible that x and y do not satisfy Φ), and non-identity-involving (i.e. it does not presuppose the identity it should demonstrate); otherwise, it is uninformative.⁵ Consider for instance “being the same entity” as a condition of personal identity over time. If we take it as a completion Φ of the schema above, it would result that “ $x=y$ if and only if they are the same entity”. Even if such a condition of identity is both necessary and sufficient, it is uninformative, for it is trivial, and it presupposes the identity it ought to demonstrate - namely the identity between x and y . Further examples of uninformative conditions for diachronic identity are, for instance, assumptions such as “an omniscient being believes that”, or “they are numerically identical”, etc. On the other hand, if we take “having the same number of particles” as an identity condition, it follows that “ $x=y$ if and only if they have the same number of particles”, which is an informative condition of persistence (regardless of whether it is correct). Hereafter, when I talk about criteria of persistence, I refer only to informative conditions of persistence.

At this point, some remarks on the problem of personal persistence and its formulation are in order. First, while considering the schema (1), one may be inclined to reformulate the question in an easier way, namely:

(1*) Let x be *a person* that exists at time t^1 and y *a person* that exists at t^2 [where $t^1 \neq t^2$]. Necessarily, $x = y$ if and only if $\Phi(x,y)$

Although this formulation appears nothing but an alternative to (1), there is something different in it. If we ask for the condition Φ that makes a person at t^1 identical to a person at t^2 , we are assuming that, in order to persist over time, a person should necessarily remain a person; this assumption might be called *personal essentialism*. In (1*) the problem of personal identity over time is combined with personal essentialism about persistence; (1*) is an essentialist version of the problem of personal identity over time. Advocates of personal essentialism may argue in favor of (1*), by claiming that if something is a person at one time, it cannot exist at another time without being a person.⁶

⁵ On this issue, see (Noonan 2011), and (Noonan and Curtis 2018).

⁶ For a defense of personal essentialism, see (Swinburne 1984) [«Certainly, to be the same person as an earlier person, a later person has to have the same form – i.e., has to be a person» (p. 26)], and (Lowe 2012b) [«it is strongly built into the common-sense conception of a person that all persons are essentially

Otherwise said, advocates of personal essentialism substitute the requirement that at least one between x and y is a person with the requirement that both x and y are persons, so that (1*) may be also formulated as follows:

(1*) Let x be an entity that exists at time t^1 and y an entity that exists at t^2 [where i) $t^1 \neq t^2$ and ii) $Px \ \& \ Py$]. Necessarily, $x = y$ if and only if $\Phi(x,y)$.

Personal essentialism seems rather reasonable, and as a matter of fact, there is no actual case in which it does not seem to work. However, the essentialist assumption seems to rule out some substantive questions, which are strictly related to the problem of personal persistence. For instance, it would immediately rule out all those cases in which substantial transformations occur. How can Gregor Samsa become a cockroach in Kafka's metamorphosis if persistence cannot obtain between Gregor and the cockroach (to say nothing about the frog that is transformed into a prince)?

Besides these cases, I think that endorsing personal essentialism when dealing with personal identity over time entails a radical change of the persistence question itself. Personal essentialism, I argue, leads necessarily to a reduction of the persistence question to different questions about personal identity, such as questions on the metaphysical nature of persons ('what are we really?'), and questions on the concept of personhood ('what does it take for something to be a person?'). More precisely I argue that (1) concerns the *diachronic conditions of identity of an entity that sometimes is a person*, whereas (1*) concerns the *diachronic conditions of personhood*. Suppose we accept personal essentialism, and hence (1*). If we do, and we want to explain personal identity over time, we need to determine the concept of "person" first of all. Imagine we accept the Lockean account, advanced in the *Essay Concerning Human Understanding* - according to which a person is a rational thinking being). Given personal essentialism, the condition for personal identity over time would as a consequence necessarily be mental, for it needs to guarantee the persistence of the person as a rational thinking being. Nonetheless such a condition of persistence only explains what it takes for a person to persist *as a person*. Questions about the possibility that a person might have been an embryo in the past, or eventually a human vegetable in the future, lose any sense: they appear indeed trivially false, for neither embryos nor human vegetable are persons conceived as 'rational thinking beings'. It follows that if we accept personal essentialism, we cannot avoid promoting some accounts of personal identity over others, depending on the definition of "person" we start with - which is to say depending on the way we

persons, so that my ceasing to be a person would entail my ceasing to exist altogether» (p. 146)]. In general, neo-Aristotelian approaches to metaphysics, taking identity over time in terms of the persistence of sortal properties, seem to lead to personal essentialism - see (Lowe 2009).

answer questions on the metaphysical nature of persons and/or the nature of personhood. For that reason, I am inclined to prefer (1) rather than (1*⁷).

Still, (1) may be too strict, for it cannot account for cases in which, although neither *x* nor *y* are persons, it is legitimate to claim that the same entity persists over time. Take again Gregor Samsa's case, and let *x* be Gregor's embryo and *y* the cockroach after the metamorphosis: (1) is not able to account for case like this, although it seems legitimate to claim that the same entity persists over time by being an embryo, then a person, and finally a cockroach. And setting aside extraordinary case of this kind, the same occurs if we consider one's embryo (for instance Napoleon's) and his corpse. A possible amendment of (1) as the correct formulation of the persistence question for persons is to say that, if neither *x* nor *y* are persons, then there should be a *z* such that i) *z* exists at t^3 [where $t^3 \neq t^1 \neq t^2$], ii) *z* is a person, and iii) the constitutive condition of identity Φ connects both *z* and *x* and *z* and *y*. The formula (1**) below would be hence even more accurate than 1):

(1**) Let *x* be *an entity* that exists at time t^1 and *y* *an entity* that exists at t^2 [where i) $t^1 \neq t^2$; and ii) $(Px \vee Py) \vee \exists z (z \text{ exists at } t^3 (t^3 \neq t^1 \neq t^2) \ \& \ Pz \ \& \ (\Phi(z,x) \ \& \ \Phi(z,y)))$]. Necessarily, $x = y$ if and only if $\Phi(x,y)$ ⁸

Keeping in mind this adjustment of the persistence question for persons when dealing with some extreme cases, in what follows I will continue referring to (1) which is easier to deal with.

Second, ontological conditions of identity need to be distinguished from epistemic conditions of identity. Given two entities, a condition of identity is *ontological* if it is constitutive of their being numerically identical, while it is *epistemic* if it concerns how we come to know (or we are justified in claiming) that two things are the same. As regards personal persistence, an ontological condition of personal identity over time determines

⁷ As a starting point, see (Dummett 1981), who rejects that conditions of identity must be conditions of identity *for a type of object* by referring to a more basic level of numerical identity (expressed using demonstratives and ostensions), in which the relation of identity does not refer to any particular sortal concept. (Olson 1997: 22-27) draws the distinction between unrestricted (or broad) criteria and restricted (or narrow) criteria of identity, defending the former reading. (Sattig 2008, 182) discusses this distinction, and argues that although it concerns the domain of application of the criterion, it is independent of issues concerning kind-membership. (Olson 2016: section 2) rejects personal essentialism: «whether we are organisms or were once embryos are substantive questions that an account of personal identity ought to answer, not matters to be settled in advance by the way we frame the debate. So we cannot assume at the outset that we are people in something like Locke's sense essentially. [...] It is like asking which man committed the crime before ruling out the possibility that it might have been a woman».

⁸ One may argue that such a complication of the persistence question (1) is not necessary, for it may also be avoided by applying the formula (1) in two passages and appealing to the transitivity of identity (Thanks to Paolo Valore for pointing that out to me). Thus, extreme cases like the one in which *a* and *c* are respectively an embryo and a corpse may be solved as follows: if $a=c$ (where *c* is a person) and $c=b$, then $a=b$. Since in what follows I will refer to (1) anyway, I will stay neutral on the necessity of (1**) as a more accurate formulation of (1).

whether a person does, or does not, persist through time; while an epistemic condition of personal identity over time traces what is required for us to claim that a person persists, or does not persist, through time. This distinction explains how the problem of personal persistence we are dealing with does not concern the evidence question (as stated below). The two questions can be thus formulated in the following way:

Persistence question: What are the constitutive conditions of personal identity over time? What does it take for a person to persist from one time to another?

Evidence question: How do we find out whether a person at one time is numerically identical to a person at another time? What evidence do we need to maintain that a person we see today is or is not the same person we saw yesterday?

In spite of these differences, the conditions we usually take as evidence of personal identity over time may be the same as the constitutive conditions of identity. We might think, for instance, that our persistence consists in our memory, or in our physical continuity, or in some other constitutive criteria. Similarly, we might think that we ought to take an entity at t^1 and an entity at t^2 as the same person in virtue of their memories, or their physical features, or in virtue of another aspect. However, there are cases in which some pieces of evidence of identity across time definitely appear distinguished from any source of persistence, for they do not provide any constitutive condition of diachronic identity. Suppose, for instance, that we meet a friend after a long time without having seen him. In asking how we might know if the person now is really our friend, we confront the *evidence question*. It is likely that his physical features are the first evidence we may consider, in order to accept that he truly is the same person with whom we were acquainted years ago; and if some of these features contrast with those characteristic of our “past friend”, we might remain, at first, a bit doubtful towards the person in front of us. Thus, we might consider other aspects, different from the physical ones; for instance, we might find out whether he is or he is not the person he says he is by asking him something about his past, something we already know about him. It appears that both physical and mental features may be good evidence for *claiming* the identity of a person; however, they do not necessarily provide any ontological criteria of persistence. Epistemic conditions, in fact, are *neither necessary* for personal identity over time (one might change some physical features and/or forget some of his past events, but nonetheless persist across time) *nor sufficient* for it (we might imagine the case in which there is another person, who resembles our friend and is aware of the most important events of his life). A further example of epistemic (but not ontological) conditions of persistence is our fingerprints. Fingerprints are good evidence of persistence, perhaps even conclusive evidence of identity over time. Nonetheless, having the same fingerprints is no constitutive condition of persistence, for it is neither necessary (one can persist even

after losing his own fingerprints, because of an accident for instance), nor sufficient (we can think that two distinct persons have exactly the same fingerprints).⁹

Reasonable answers to the evidence question do not seem to imply any corresponding solution to the problem of persistence. What about the opposite? Asking whether a criterion of persistence ought to entail any piece of evidence (that is any epistemic condition) of persistence seems to be more complicated and would deserve a more accurate discussion. I am inclined to think that the existence of any constitutive condition of diachronic identity should entail the (logical) possibility of some pieces of evidence for such an identity, regardless of whether or not we actually know (or we could practically know) them. Suppose, for instance, that the constitutive condition of personal identity over time consists in a determinate physical fact, that is “being composed by some determinate fundamental particles”, which one might call 'super-microscopical'. Of course, this criterion of persistence does not provide us any actual evidence of personal persistence, for we cannot perceive such particles, neither ordinarily nor by using the tools we actually have; nevertheless, we should agree that observing such a condition is at least logically possible, for instance by using instruments we do not have yet. There is more to say in elucidation of this point, but that will suffice as a specification of the issue.

Third, it should be noticed that although I used ‘personal persistence’ and ‘personal identity over time’ interchangeably, they properly describe two distinguished states of affairs, as famously argued by Parfit – cf. (Parfit 1971a, 1971b, 1982, 1984). According to this latter, identity does not matter in persistence in terms of survival, for identity and persistence-survival involve different kinds of relations: while identity is a one-to-one relation, survival is (at least in principle) a one-to-many relation, and hence can consist in one-to-many relations – such as mental or physical continuity. Thus, these latter result in criteria of personal persistence (i.e. personal survival), though they are not criteria of diachronic identity for persons. Since the literature on Parfit and its denial of identity as

⁹ Although this is the standard way epistemic conditions of identity over time have been formulated (see (Noonan 2003; Olson 2016), the following worry may arise, based on the distinction between “to know something” and “to believe something” [where “to know that p ” is “to believe that p + it is true that p ”]. (I’m grateful to Paolo Valore for driving my attention to this aspect) If the epistemic conditions of identity are *the conditions to know that p* , rather than *the conditions to believe that p* , then the fingerprints case above does not constitute a case of epistemic condition of identity. This is because fingerprints are not conclusive proofs of epistemic identity if we allow for different persons to have the same fingerprints; they are conclusive just for practical issues (in a trial, for instance). A conclusive proof of epistemic identity requires that every time that a and b have a certain property Φ (e.g. having the same fingerprints), then we know that $a=b$. But if we accept the possibility that two distinguished individuals have the same fingerprints, we are denying that every time that a and b have a certain property Φ , then we know that $a=b$. In the case above we *believe* that $a=b$, but we *do not know* that $a=b$. However, since this point constitutes no threat to the general distinction between ontological conditions of identity and epistemic conditions of identity, concerning rather the specific case advanced, I will not be investigating it further.

survival has become quite extensive,¹⁰ I shall not attempt a full discussion of its strengths and weaknesses here. What is important to notice is rather that in spite of the insightful Parfitian account, I am treating ‘identity over time’ as simply synonymous with ‘persistence’, in accordance with the main literature on this issue. I am aware that this is a substantial philosophical issue, based on a more general identification between some sort of continuity of future concern and personal identity over time. And I am also aware that such an identification can be rejected, as Velleman argued in his *Self to Self*

“To wonder how much of the future I can anticipate experiencing is just to wonder how far into the future there will be experiences that I am now in a position to prefigure first-personally. If this question truly expresses what I want to know about my survival, then what I want to know is a matter of perspective rather than metaphysics. My question is not how long there will be an individual identical with my present self, DV. My question is how long there will be someone to occupy the position that is the center of my self-centered projections-someone to serve as the referent of "me" as it occurs in my prospective thoughts.” (Velleman 1996, 68)

In a nutshell, according to Velleman the question about our future concern (which is “what matters for survival”) and the question about personal identity should be distinguished, for their identification rests upon a doubtful conflation of metaphysical and perspectival notions – a conflation started long time ago by Locke. However, even accepting that survival does not entail identity at different times and they are in fact different issues, it is reasonable to say that identity at different times *does* entail survival. Thus, since in what follows I will focus on identity over time, I will take survival as a good evidence of identity, unless something different will be specified.

1.2. The accounts of personal persistence: a standard classification

Abstracting from the many nuances and points of details, the accounts of personal identity over time fall into three classes: accounts that privilege mental criteria of personal persistence (1.2.1.); accounts that privilege somatic (or physical) criteria of personal persistence (1.2.2.); and accounts that deny the existence of any constitutive condition of personal persistence (1.2.3.)¹¹.

¹⁰ For an introduction to Parfit’s account of personal survival, see (Shoemaker 2016, sec. 2.5.), and then the pieces in (Dancy 1997) and (Kirchin 2017). On the revisionary aspects of his theory, see (Rovane 1998, 11; Martin 1998, 15).

¹¹ See (Noonan 2003), (Gasser and Stefan 2012), and (Olson 2016).

1.2.1. Mentalist accounts of personal persistence

Mentalist accounts of personal persistence argue that people are identical over time in virtue of some mental aspects. In other words, an account of personal identity over time is mentalist if it claims that the persistence of people rests necessarily and sufficiently upon some kind of mental relation. Given the schema (1) above, mentalist accounts of personal persistence maintain that:

(ME- Φ) Let x be an entity that exists at time t^1 and y an entity that exists at t^2 [where i) $t^1 \neq t^2$ and ii) $Px \vee Py$]. Necessarily, $x = y$ if and only if x and y are connected by such and such determinate mental relations.

This approach, which starkly distinguishes the persistence of persons from the persistence of any other kind of material object (such as glasses, mugs, and arguably at least some living beings such as plants and flowers), is probably the one that traditionally has had the most advocates. There are substantial differences among the several mentalist accounts of personal identity over time, though. A significant difference consists in what kind of mental relation should stand between x at t^1 and y at t^2 in order to be constitutive of their identity. Mental relations include, for instance, the continuity of memories, preferences and beliefs (this is the Lockean account of personal persistence)¹²; or the functional continuity of psychological states; or the continuity of the first-person perspective; or even the phenomenal continuity of experiences.¹³

1.2.2. Somatic accounts of personal persistence

Somatic (or physical, or biological) accounts of personal identity over time claim that personal persistence rests upon some physical aspects. These accounts take some physical relations as necessary and sufficient conditions of people's persistence. Referring to the schema (1), physical accounts argue that

¹² Although it is disputable whether Locke actually held a memory criterion, this is the way the 'traditional Locke' is considered in the literature on personal identity. On this issue, see (Behan 1979).

¹³ (Shoemaker 1984) advances a materialist account of mental continuity, according to which some "appropriate relation of causal dependence" (p. 90) among psychological states is constitutive of personal persistence. This account aims at avoiding the arguments of circularity against Lockean approach – on circularity and memory-based personal identity, see (Sattig 2018), whereas (Sattig 2017) rejects episodic memories as a guide for personal identity. The first-person perspective account has been recently defended by (Baker 2000, 2013, 2018), and (Noonan 2003, 2010b, 2010a). (Dainton and Bayne 2005) offers a phenomenal account of personal persistence. Among the advocates of mentalist accounts of personal persistence, see also (Grice 1941), (Quinton 1962), (Parfit 1971a, 1984), and (Perry 1975). (Schechtman 1996) defend an identification relation in terms of narrative self, but she denies that it is a constitutive condition of numerical personal identity (on this issue see also (Schechtman 2018)).

(SO- Φ) Let x be an entity that exists at time t^1 and y an entity that exists at t^2 [where i) $t^1 \neq t^2$ and ii) $Px \vee Py$]. Necessarily, $x = y$ if and only if x and y are connected by such and such determinate physical relations.

As with the mentalist solutions of personal persistence, there are important distinctions among the somatic accounts, depending on the proposed physical relation between x and y . Some advocates of a somatic approach to personal persistence argue, for instance, that bodily continuity is the relevant relation, so that the continuity of the human body constitutes the criterion of personal identity over time. Others support the idea that personal persistence rests upon the continuity of the biological (living) organism (this is the so-called “biological” or “animalist” account of personal identity); whereas others argue that personal persistence is based on the continuity of an essential part of our body, e.g. the brain.¹⁴

1.2.3. Anti-criterialist accounts of personal persistence

Finally, there are the anti-criterialist accounts of personal persistence. If both the mentalist approach and the somatic approach accept the existence of criteria for answering the persistence question (psychological conditions for the former, physical conditions for the latter), anti-criterialist views simply reject the existence of any criteria of personal persistence. Referring to schema (1), they argue that the only necessary and sufficient conditions of personal identity over time are not informative, such as

(AC- Φ) Let x be an entity that exists at time t^1 and y an entity that exists at t^2 [where i) $t^1 \neq t^2$ and ii) $Px \vee Py$]. Necessarily, $x = y$ if and only if x and y are the same person over time.

As explained above, a criterion of persistence must be an informative, necessary and sufficient condition of identity over time. It follows that any view on personal persistence is anti-criterialist if it denies the existence of any informative, necessary and sufficient condition of identity over time for persons. Although accepting that some psychological or physical continuities may be good pieces of evidence for personal persistence, any anti-criterialist account rejects that they are constitutive conditions of such persistence.

¹⁴ For a defense of a bodily account of personal identity, see (Johnston 1997). (van Inwagen 1990b), (Olson 1997a, 1997b, 2003), (DeGrazia 1999, 2005) and (Snowdon 2014) argue in favor of a biological and animalist account; a recent argument for animalism has been presented by (Bailey 2017). (Nagel 1986) defends a brain-based approach. (Sharpe 2015) and (Madden 2016) discuss forms of animalism that take into consideration psychological states and/or capacities too for persistence - e.g. taking psychological states as part of a sufficient (although not necessary) condition for persistence of human animals. For an account of biological identity based on central concepts of immunology, see (Pradeu 2012).

Thus, anti-criterialist accounts take identity over time as something primitive, i.e. unanalyzable and not explainable through any further facts.¹⁵

Another distinction, strictly related to the criterialist-anti-criterialist one, is that between the *complex* and the *simple views* about personal identity. On the one hand complex views consider personal identity as definable in terms of something besides personal identity, whereas on the other hand simple views reject such a possibility, taking personal identity as something brute, and unanalyzable. Traditionally, the complex/simple and criterialist/anti-criterialist dualisms have been reduced to one another, but some perplexities have been advanced recently.¹⁶

Besides these three views, a fourth one has been usually recognized though, namely the four-dimensionalist account of personal persistence (or ‘ontology of temporal parts’ applied to persons¹⁷). Personal identity scholars usually refer to this approach as the view defended by Lewis (1971, 1976), and recognize two fundamental aspects of this approach: i) persons are extended through time as they are through space (say, by having different temporal parts at different times); and ii) there is no unique right answer to the persistence question, for the connection between parts at different times depends on the relation we may want to consider.

In the following sections I will analyze this latter account of personal persistence. I shall argue that the idea of *one* four-dimensionalist account of personal persistence, which reduces to Lewis’s specific account, is misleading, for it rules out several reasonable alternatives within a four-dimensionalist framework. In order to explain how several positions may be advanced within a four-dimensionalist account, according to which persons are entities that extend over time, I shall start by focusing on the distinction between theories of persistence (section 1.3.). I will introduce hence the distinction between endurantism and perdurantism applied to personal persistence. Dealing with mereological accounts of theories of persistence (rather than locative ones – see chapter 1.4.), I will focus my attention on temporal parts – in particular applied to persons (chapter 1.5.) and their relations. I will discuss hence the way they are composed (if any), introducing what I called the “diachronic composition question” applied to persons (chapter 1.6.). Chapter 1.8. will present Lewis’s account of personal persistence, which is the most famous perdurantist account of identity over time applied to persons. In chapter 1.9. I will explore some alternative accounts of personal persistence within an ontology of temporal parts, paving the road to some new (and moderate) accounts of personal identity over time.

¹⁵ Rejecting the Lockean approach to personal identity, (Butler 1736) and (Reid 1785) have been forerunners of an anti-criterialist approach. More recently, anti-criterialist accounts to personal persistence have been advanced by (Chisholm 1976), (Swinburne 1984), (Lowe 1996, 2009, 2012b), and (Merricks 1997, 1998). (Zimmerman 1998) discusses the difficulties of primitive identity theories.

¹⁶ (Olson 2012) rejects as unclear the simple/complex distinction applied to personal identity, defending rather the criterialist/anti-criterialist one; on this issue, see also (Buonomo 2016).

¹⁷ (Olson 2016, sec. 8).

1.3. The metaphysics of persistence: the mereological account

As seen above, the persistence question can be characterized in terms of the question about the criteria of identity over time, namely the search for the right completion Φ of schema (1). As general as it may appear, this formulation of the persistence question rests upon a determinate metaphysical assumption concerning the way things persist, namely the assumption that things persist by *enduring* over time. According to an endurantist account of persistence (also called *endurantism*), things pass through time without being spread in time; things are “wholly present” at any moment of their existence. Opposed to endurantism, *perdurantism* is the thesis that things persist by having different temporal parts at different times; things pass through time being spread in time. The distinction between these theories of persistence appeared for the first time in Lewis’s *On the Plurality of Worlds*, who attributing the distinction to Johnston, defined these two kinds of persistence as follows.

Let us say that something *persists* iff, somehow or other, it exists at various times; this is the neutral word. Something *perdures* iff it persists by having different temporal parts, or stages, at different times, though no one part of it is wholly present at more than one time; whereas it *endures* iff it persists by being wholly present at more than one time. (Lewis 1986: 202)

Two aspects are worth consideration. First, it should be noticed that, regardless of which theory of persistence is correct, the world might in fact look like just as it actually does. It follows that the debate between different theories of persistence cannot be settled empirically in any straightforward ways, requiring a theoretical ground rather than an empirical one. Second, it should be noticed that such a distinction between endurantism and perdurantism rests upon *mereological issues*, for they concern the existence and the explanatory role of temporal parts for persistence¹⁸. Although this is not the only way the distinction between endurantism and perdurantism may be spelled out, I will focus primarily on the mereological account of these theories, and in particular on the perdurantist approach to personal persistence. On the basis of this specific account of persistence, I will attempt to deal with the persistence question, looking for a constitutive condition of diachronic identity for persons.

1.3.1. Endurantism

¹⁸ The distinction between ontological and explanatory issues concerning temporal parts has been discussed by (Wasserman 2016) and will be discussed below in section 1.3.2.

Among the theories of persistence, endurantism has a mainstream position, with a very remarkable pedigree. The list of its advocates is extended, including (Thomson 1965, 1983), (Geach 1967), (Chisholm 1976), (Lowe 1983, 1998), (Simons 1987), (van Inwagen 1990a, 1990b), (Oderberg 1993), (Merricks 1994), and (Fine 2008)¹⁹.

One fundamental reason for its success is that seems to meet our intuitions: things persist over time *passing through time* and being strictly speaking identical over time. To say that something (let say a cat) persists over time by *enduring*, means that given two different times, say $t^1 < t^2$, the cat at t^1 and the cat at t^2 is the same (entire) entity respectively at two different times. This is the way we normally think about persistence, and this is the way endurantism frames persistence: things persist over time being wholly present at all moments at which they exist, as claimed in the following quotations:

[...] we usually think [...] that at any time at which a person exists the whole or entire person exists at that time. (Graham 1977, 309)

[...] questions of continuity and persistence that perplex our habitual modes of thought about identity and difference [...] need] answers given in language that speaks as simply and directly as natural languages speak of proper three-dimensional continuants – things with spatial parts and no temporal parts, which are conceptualized in our experience as occupying space but not time, and as persisting whole through time. (Wiggins 1980, 25)

Despite its correspondence to our intuitions, it has been noticed that the standard definition of endurantism appears rather controversial. In fact, although the notion of being “wholly present” has been largely used to present and explain the endurantist approach²⁰, still it does not seem clear what “wholly present” is actually intended to mean²¹. Admittedly, it seems that any positive definition of being wholly present turns out to be problematic.²²

1) Consider, for instance, “being wholly present at t ” as “having all of its parts at t existing at t ”. Sure, this is something that any endurantist would accept, but still it is a too loose understanding of “being wholly present”. Take a certain entity A . To say that “ A has all of its parts at t existing at t ” is in fact trivially true, and does seem compatible with an

¹⁹ Since the literature on these issues (and more in general on three and four-dimensionalism) has become quite extensive, and since my purpose here is just to introduce the reader to the main variants of theories of persistence, I shall not attempt a full discussion of the various positions advanced. For further reading, with a complete list of references, see (Sider 2001a, 3) and (Hawley 2015).

²⁰ See among others (Balashov 2000), (Crisp and Smith 2005), (Hawley 2001: 14), and (Rea 1995, 1998).

²¹ For discussion, see (Markosian 1994) and (Merricks 1999a). (Crisp and Smith 2005) offer an overview of the definition of “wholly present”. (K. Miller 2008a) defends a definition of endurance which is still mereological but avoids commitment to any controversial metaphysical thesis. Arguing that the standard conception of endurance is flawed and incoherent, (Hofweber and Velleman 2011) advance a different account of the endurantism/perdurantism distinction, in terms of identity, so that an object endures if its identity is determined at every moment at which it exists, whereas it perdures if it persists but its identity is not local to each moment at which it exists.

²² Some of these cases has been originally discussed in (Sider 2001: 64-68).

ontology of temporal parts as well. Both perdurantism and stage view would result accepting that things are “wholly present at t ”, if this just means that things have all their parts at t existing at t .

2) Alternatively, one may suppose that “being wholly present at t ” means “having all of its parts at any time existing at t ”. Contrarily to the first option, this one appears too strict, for it commits endurantists to a sort of mereological essentialism. From the fact that something is wholly present at t if and only if it has all of its parts at any time existing at t , it follows that something is not wholly present at t if it lacks at t at least one part that it had in the past (e.g. at $t^0 < t$) or it will have in the future (e.g. at $t^1 > t$). Otherwise said, the only persisting things are things that do not lose nor gain parts. But since material things in our world do lose and gain parts, then they are not persisting things according to such a form of endurantism. The endurantist world results, at the end of the day, a succession of entities that last for brief periods of time, namely for periods in which entities do not lose nor gain any part. A notable case of endurantism that accepts mereological essentialism is the *entia successiva* view defended by Chisholm – cf. (Chisholm 1976).

Although such an endurantist approach to persistence (END) + mereological essentialism (ME) is reminiscent of the so-called stage-theory (see below chapter 1.3.3.), I think there are at least two differences among them. First, although END+ME may result in a stage view in the actual world, still this is a contingent fact, related to the fact that in the actual world things do gain and lose parts continuously. Still, END+ME appears significantly different from a stage view as soon as we consider a world in which things do not lose nor gain any parts from their creation to their destruction. In this scenario, on the one hand END+ME should claim that things persist over time being wholly present at any time at which they exist, whereas on the other hand a stage theory should claim that things are nothing but momentary things, regardless of their losing or gaining parts. Second, and on the same line, END+ME differs from stage theory in all those cases in which something does not lose nor gain parts for a period of time which is longer than the period of time of a stage (suppose that stages are atomic and their temporal extension is shorter than the period of time through which things do not lose nor gain parts). In other words, END+ME and stage theory differ from each other in all those cases (if any) in which things do not lose or gain parts for more than one instant. This is because the entities of stage theory are instantaneous, whereas the entities of END+ME are not and persist through time being strictly identical one to another.

3) A further option is that “being wholly present at t ” stands for “having all of its temporal parts existing at t ”. I doubt this is a good option either, for it leads either to an obscure scenario or to a trivial one. Such a double possibility rests upon how many temporal parts “all of its temporal parts” refers to. Suppose first that it refers to a plurality of temporal parts; in this case, we ought to recognize that there is a plurality of temporal parts and that such temporal parts exist (i.e. the fact that all temporal parts of a certain

entity are co-located at t)²³. But what does it mean that several temporal parts are co-located? What does it take for two co-located temporal parts to be two rather than one? Suppose secondly that “all its temporal parts” refers to the case in which the temporal part is just one: the definition of “being wholly present at t ” as “having all of its temporal parts existing at t ” is trivial. In this case, even perdurantists would agree that objects “have all their temporal parts existing at t ”.

The fact that no definition of “being wholly present” seems sufficiently convincing led most metaphysicians to account for “wholly present” in purely negative terms, so that to persist as wholly present means to persist “not by having different (temporal) parts at different times”²⁴. In other words, by saying that things are wholly present at any time in which they exist, endurantists claim that things are not extended through time in virtue of different parts at different times. Even accepting that things may have different (spatial) parts at different locations, endurantism denies that things persist by having different (temporal) parts at different times. Any time an object exists, the object itself is entirely there, persisting as a whole. Consider the following spatial example, which may be of some help to understand the idea of enduring over time. Things enduring over time are similar to billiard balls stricken on the pool table: enduring things cross time as billiard balls cross the pool table; they are wholly present at any moment of their existence as billiard balls are wholly located in one place at any instant²⁵.

Also, when applied to people the three-dimensionalist account of persistence sounds rather intuitive, being in line with the way we ordinarily think about ourselves in the world. This is in fact what we ordinarily think when we claim “John was in Athens visiting the Parthenon two weeks ago”. It was John who saw the Parthenon two weeks ago, and who was happy to notice that it was not much different from the idea he had of it. Today

²³ One may argue that existence is not to be understood as location in this case, but rather as existence simpliciter. It would follow that by saying that something exists at t does not require that something is located at t , but that at t it is located at some $t^* \neq t$. Although viable, I do not think this would lead to a form of endurantism, being rather compatible with a form of eternalist perdurantism (things have temporal parts and at every moment of their existence they have all their parts, some of them located somewhere in the past and some of them located somewhere in the future).

²⁴ A negative definition of “wholly present” has been recently defended by (Wasserman 2016: 247): “ x is wholly presents at t =*df* x exists at t , but not by having a proper temporal parts at t ”. See also (Markosian 1994), (McCall and Lowe 2006: 427), and (McCall and Lowe 2009).

²⁵ One may point out that the image of the billiard ball moving through the pool is imprecise for the following reasons: i) the pool table is finite whereas time may not be like that; ii) the pool table is entirely present during the whole trajectory of the ball, whereas time may not be like that (it is not like that, for instance, according to A-theories of time such as presentism, and growing block); iii) billiard balls can move towards different directions, whereas time usually appears linear (although not always, as in time travel cases); iv) it does not appear clear how the division of a ball into two parts which take two different directions may be applied to time. Since I think all these worries are meaningful, I consider this image as nothing but a metaphor of an endurantist conception of persistence. Moreover, this is what also Sider seems to have in mind when he claims that “a perduring object is ‘spread out’ over a region of spacetime, whereas an enduring object ‘seeps through’ a region of spacetime, the whole of the object occupying the region’s subregions at different times” (Sider 2001a, 3). Against the analogy between persistence (as a sort of “travel through time”) and travel through space, see (Hofweber and Velleman 2011, 39).

John is Boston: as he crossed the ocean during his fly back home, similarly he crossed time. It is not just a part of John that is in Boston today, with lots of pictures of his travel; it is “the whole John”. The same person who saw the Parthenon two weeks ago.

Typical arguments for endurantism are the arguments from motion and the argument from permanent coincidence. All these arguments present some (alleged) puzzling scenarios that endurantism seems able to solve, whereas perdurantism appears having more troubles²⁶.

The arguments from motion concern the difficulties that perdurantism has in explaining the motion of objects, as well as the violation of some laws of physics²⁷. One problem may emerge as soon as we consider some parts of an object which are very far apart from one another. For instance, consider two objects extremely distant, let say A and B, and consider the fusion of the A’s temporal part at t^1 (a_1) and B’s temporal part at t^2 (b_2) – where $t^1 < t^2$. The object which is the fusion of a_1 and b_2 results travelling faster than the speed of light, violating hence a law of physics²⁸. Further issues used by endurantists to support their account of persistence arise from the so called “rotating disc problem”²⁹. In a nutshell, the problem is that, given a homogeneous, continuous and perfectly circular disk (or two duplicate disks of this kind), perdurantism is not able to explain the difference between the following two cases: i) the case in which the disk is stationary; ii) the case in which the disk is rotating. This is the consequence of the fact that the disc is either stationary or rotating in virtue of the movement of its spatial parts. However, on the perdurantist picture any spatiotemporal sub-regions of the disk correspond to a part of the disk, which behaves in the same way regardless of its being stationary or rotating. The two cases would hence collapse into a single one. Besides the fact that this case threatens any approach committed to a Humean Supervenience (according to which all facts supervene on the distribution of local properties throughout space-time - (Lewis 1986b, ix–xvii, 1994)), the main problem for perdurantism is that it cannot provide us with any explanation of the difference between the two cases, whereas

²⁶ According to (Magidor 2016), this is indeed the typical form of pro-endurantism and pro-perdurantism arguments, the counter-arguments consisting in rejecting the puzzle (showing that it is not well formulated, or that it is not a puzzle at all) or in providing the puzzle with an equally satisfactory solution [for arguments against four-dimensionalism, see (Sider 2001a, chap. 6)]. In the same article, Magidor claims that the central arguments for endurantism and perdurantism actually rely on claims which are orthogonal to the endurantism/perdurantism debate, namely the commitment to unrestricted composition (“liberalism”) or its denial (“restrictiveness”). If this is correct, and hence if endurantism and perdurantism may actually end up with the same responses to such arguments, provided they agree on somewhat further claim, these arguments result missing the point of the persistence debate.

²⁷ For discussion, see (Hawthorne 2006, chap. 6).

²⁸ On the standard reply advanced by perdurantists (based on the idea that laws of physics require a quantification over a restricted set of objects) and the counter-reply (consisting on the specification of such a restriction), see (Hawthorne 2006)

²⁹ The rotating disc problem, as well as similar scenarios, has been discussed inter alia by (Sider 2001a, 224–36; Hawthorne 2006, 119–23; Magidor 2016, 521–24).

endurantism may distinguish the two cases in virtue of the different patterns of occupation of spacetime points by the enduring parts of the disks.

The argument from permanent coincidence is supposed to show that perdurantism cannot easily account for the possibility of two things that are always coincident - such as a statue and a lump, which are created at exactly the same time and destroyed at exactly the same time. According to perdurantism, which accepts the parsimonious principle of 'constitution is identity', an object A is identical to an object B (i.e. A and B are one and the same thing) iff A and B have exactly the same temporal parts. In contrast, A and B are not identical (i.e. they are two rather than one) iff A and B do not have exactly the same temporal parts (I will come back to this point in section 1.3.2., when discussing the advantage of perdurantism in dealing with cases of non-permanent coincidence). It follows that permanent coincident objects - say the statue and the lump of our example - are one and the same thing. But if so, perdurantism should explain away that the statue and the lump have different properties (such as different modal properties), or find a different way to account for the identity of the statue and the clay and such differences in modality³⁰, whereas endurantism can appeal to the same strategies advanced to deal with standard cases of coincidence (cf. section 1.3.2. below).

1.3.2. Perdurantism

The other way to characterize the persistence of material objects recognized by Lewis is based on the fundamental thesis that things persist by having different parts at different times. This is the *perdurantist* (or *four-dimensionalist*) account of persistence.

According to this approach, the idea that the persistence of things over time consists in their passing through time (and hence enduring over time) is misleading. Taking objects as four-dimensional entities composed by space-temporal parts (like processes and events), four-dimensionalists claim that the persistence of material things consists rather in their stretching through time³¹. As things stand, a perdurantist account explains persistence in terms of an extension over time in virtue of temporal parts, somehow similarly to the way extension over space is explained in virtue of spatial parts³².

³⁰ A possible way to account for modal properties in this case is, for instance, the use of the theory of counterparthood, as suggested by (Lewis 1971). For a different perdurantist solution to the argument of permanent coincidence, see (Magidor 2016).

³¹ On the similarities between objects and processes, see (Broad 1923, 393) ["A thing... is simply a long event"] and (Goodman 1951, 357) ["a thing is a monotonous event; an event is an unstable thing"]. Criticisms against such a unification have been advanced by (P. F. Strawson 1959, 56–57), (Wiggins 1980, 25) and (Mellor 1981, 8–10).

³² It would appear that the unification of space and time, as well as the denial of any special feature of the temporal dimension advocated by some interpretation of special relativity, offered a very important argument in defense of four-dimensionalism. On this issue, see (Broad 1923), (Smart 1972), (Balashov 1999, 2010); (Gibson and Pooley 2006) offers a good overview of the issue. (K. Miller 2004) argues that special relativity is compatible with endurantism as well.

Although the idea that things are four-dimensional entities is not a recent one - see (Russell 1914, 112ff, 1927, 243ff, 284–89; Whitehead 1920; Broad 1923; Carnap 1928) - it has been specifically developed in the second half of the 20th century, in particular by (Quine 1950, 1960, 170ff) and (Goodman 1951):

A physical thing – whether a river or a human body or a stone – is at any one moment a sum of simultaneous momentary states of spatially scattered atoms or other small physical constituents. Now just as the thing at a moment is a sum of these spatially small parts, so we may think of *the thing over a period as a sum of the temporary small parts which are its successive momentary states*. Combining these conceptions, we see the thing as extended in time and in space alike. (Quine 1950, 210, italics added)

More recently, a four-dimensionalist account of persistence has been defended by (Lewis 1971, 1976a, 1986a), (Heller 1984, 1990), and (Sider 2001a). Here some examples:

A physical object is not an enduring spatial hunk of matter, but is, rather, a spatiotemporal hunk of matter. Instead of thinking of matter as filling up regions of space, we should think of matter as filling up regions of spacetime. A physical object is the material content of a region of spacetime. (Heller 1990, 3)

A person's journey through time is like a road's journey through space. The dimension along which a road travels is like time; a perpendicular axis across the road is like space. Parts cut the long way—lanes—are like spatial parts, whereas parts cut crosswise are like temporal parts. US Route 1 extends from Maine to Florida by having subsections in the various regions along its path. The bit located in Philadelphia is a mere part of the road, just as it is only a mere part of me that is contained in 1998. (Sider 2001a, 2)

Following the description of things as sums of “temporary small parts”, and the idea that persisting through time is pretty much like extending through space, perdurantists take persistence as a matter of composition of different parts over time. That is why the perdurantist approach has been strictly connected to the notion of *temporal parts*.³³ But what are temporal parts? Take a ship *S*, created on Monday and destroyed on Friday. *S* is composed by several *spatial parts*, such as the keel, the hull, the rudder, the masts, the sails, and so on. What four-dimensionalism argues is that the four-dimensional object *S* extended from Monday to Friday, has *temporal parts* as well, such as *S*-on-Monday, *S*-on-Tuesday, *S*-on-Wednesday, *S*-on-Wednesday-morning, *S*-on-Thursday-from-9am-to-10am, *S*-on-Monday-at-12-o’-clock, etc. This means that a temporal part of the four-dimensional object *S* is *S* during an interval of time which is included in *S*’s temporal

³³ See, inter alia, the definition of four-dimensionalism given by (Sattig 2008, 1): “Four-dimensionalists hold that ordinary continuants have temporal parts, or stages, as well as spatial parts. For each time at which a continuant exists, the continuant has a temporal part, or stage, that exists only at that time”.

boundaries, namely between its creation on Monday and its annihilation on Friday³⁴. More generally, if a spatial part of an object O is a part of O which is smaller than O in some spatial dimension(s), a temporal part of O is a part of O that is shorter along the temporal dimension (but which, during the relevant temporal interval, has the same spatial extent as O, i.e. it overlaps everything that is part of O during the relevant temporal interval).

There are a couple of things that I want to point out before going ahead. The first one concerns the way I have characterized temporal parts, namely as parts of a four-dimensional object whose temporal extension is smaller than the temporal extension of the whole they are parts of. The standard account of temporal parts is slightly different: temporal parts are commonly presented in fact as ‘time slices’, that is to say *momentary* (or *instantaneous*) parts of an object extended over time. Temporal parts are the smallest sections of a perdurant object; they are the parts that exist only for one instant. Although the idea that temporal parts are mereological simples seems already suggested by (Quine 1950, 210) and is explicitly defended by (Goodman 1951, 93), it is common to refer to (Sider 2001a) for a standard definition of instantaneous temporal parts (where “x is a part of y at t” and “x exists at t” are two primitives)³⁵:

x is an *instantaneous* temporal part of y at *instant* t =_{df} (i) x exists at, but only at t, (ii) x is part of y at t, and (iii) x overlaps at t everything that is part of y at t. (Sider 2001a, 59)³⁶

However, the fact that temporal parts are instantaneous does not seem necessary at all, and forces perdurantism to a disputable commitment to mereological simples, whereas perdurantism is basically neutral on the question concerning atomism and atomlessness, being compatible with temporal gunk as it is with spatial gunk³⁷. For this reason, I define temporal parts in the following way, which covers extended temporal parts too, and does not commit perdurantism either to atomism or to atomlessness.

³⁴ For a similar definition of temporal parts, see (Gilmore 2008): “Informally, a temporal part of me would be something that (i) has exactly the same size, shape, spatial location, and constituent matter as I do at any instant at which it exists, but that (ii) exists at only some (a proper subset) of the instants at which I exist. An *instantaneous* temporal part of me is a temporal part of me that exists at just a single instant. Temporally extended temporal parts last longer and can overlap one another, one beginning before the other ends.” (p. 1248, note 2):

³⁵ On instantaneous temporal parts, see also (Crisp 2003), who defines perdurantism as the view according to which objects persist as “mereological fusions of instantaneous temporal parts or stages located at different times” (p. 216). And see (Effingham 2009a), according to which perdurantism is the view that “an object has an instantaneous temporal part at every instant that it exists” (p. 301).

³⁶ For a different formulation of momentary parts in terms of fusions of simultaneous parts, see (Cotnoir and Varzi forthcoming, 236): “ $x_t := \delta y (Pyx \ \& \ \forall z (Eyz \leftrightarrow z = t))$ ” [where E is a weak location predicate, axiomatized in (Parsons 2007)].

³⁷ An account compatible with atomlessness has been advanced by (Whitehead 1920).

TEMPORAL PART: x is a temporal part of y at Δt =_{df} (i) x exists at, but only at Δt , (ii) x is part of y at Δt , and (iii) x overlaps at Δt everything that is part of y at Δt .³⁸

Secondly, a temporal part has been defined as the part that has O 's spatial size during the relevant interval of time (or more precisely, as claimed in the definition above, the part that "overlaps at Δt everything that is part of O at Δt "). This is important as it prevents some parts of an object being considered as *temporal parts* of that object. Consider again the example of ship S ; we claimed that S -on-Monday, as well as S -on-Thursday-from-9am-to-10am, are temporal parts of the perdurant object S . Nothing has been said about the keel-on-Monday, or the rudder-on-Wednesday-at-5pm, just because they are not temporal parts of S . They are *proper parts* of S on Monday and on Wednesday respectively, rather than temporal parts of S , for they are smaller than the whole S along more than one dimension³⁹. Moreover, if we accept that temporal parts of an object O have the same spatial size as O but a smaller duration of time, it seems reasonable to define spatial parts of a perdurant object as follows:

SPATIAL PART AT A TIME: x is a spatial part at t of an object O if it is a part at t of O that has the same temporal size as O but a smaller spatial size.

Third, it is interesting to notice that the standard interpretation of the endurantist-perdurantist dispute has been given in terms of the *existence of temporal parts*. However, although the question concerning the existence of temporal parts is often taken as the basis of the dispute between endurantism and perdurantism⁴⁰, there are at least two aspects worth considering.

First, the dispute between the two positions in terms of the existence of temporal parts has been criticized as confused, given the difficulties for endurantists to say what

³⁸ (Sider 2001a) seems to agree that the definition of instantaneous temporal parts can be generalized for extended temporal parts as well. (Wasserman 2018, 187–88) offers a generalization which is similar to mine, referring to time-span rather than to Δt (where "t is the time span of x =_{df} i) x exists at t; ii) x exists at every sub-interval of t; and iii) x does not exist at any interval wholly distinct from t" (p. 188)). It follows that "x is a temporal part of y at t =_{df} i) t is a time span of x; ii) x is a part of y at t; iii) x overlaps at t everything that is a part of y at t".

³⁹ Besides the general notion of (space-temporal) proper part – which is a part that is smaller than the whole object along more than one dimension – one may wonder whether the distinction between parthood and proper parthood can be applied to temporal parts as well. One may argue for instance that a *temporal part* of an object O is the "spatiotemporal part of O that has O 's spatial size, and is same or smaller than O in the dimension of time"; whereas a *proper temporal part* of an object O is "spatiotemporal part of O that has O 's spatial size, and is strictly smaller than O in the dimension of time". For the purpose of this chapter, I suggest to identify the two. For a similar account of the distinction between temporal parts and proper temporal parts, see (Heller 1990, 12): "A proper temporal part is smaller along just one dimension, the temporal dimension. A temporal part of O is a spatiotemporal part that is the same spatial size as O for as long as that part exists, though it may be a smaller temporal size) from the notion of temporal part". [On the distinction between parthood and proper parthood, as well as the different ways proper parthood can be spelled out, see (Cotnoir and Varzi forthcoming, chap. 3)].

⁴⁰ See, for instance, (Hawley 2015), (Crisp 2003), and (Effingham 2009a, 2011b, 696–97).

temporal parts are supposed to be⁴¹. As we have seen above (1.3.1.), the notion of “being wholly present” used to characterize the endurantist account has been criticized as obscure, and often substituted by the negative account of endurantism, according to which things *do not have temporal parts*. But what are temporal parts according to endurantism? They are not the parts of a certain object, because it would lead to endurantism collapsing into perdurantism. In fact, endurantists do accept that things have different parts at different times: they accept, for instance, that a ship can have different planks at different times, or that an organism have different cells at different times. One possible way to explain the substantial difference between endurantism and perdurantism may be to introduce the distinction between *temporal parts* and *temporary parts*. It seems reasonable to say that endurantism accepts temporary parts, but not temporal parts. Distinguished from temporal parts, temporary parts are parts an object does not always have, but just at certain times. If on the one hand the predicate ‘being part of’ is *atemporally* attributed to the whole when it refers to temporal parts, on the other hand the same predicate is *temporally* attributed to the whole when it refers to temporary parts. In other words, perdurant objects have temporal parts, whereas endurant objects (may) have temporary parts. By saying that a ship has temporary parts does not mean that at a certain time the ship is incomplete (that it is not “wholly present”), nor that the organism is not a whole organism after changing some cells. Although it does not provide any clear account of temporal parts within an endurantist framework, the distinction between temporal parts and temporary parts may help to understand what temporal parts are not.

Take now the definition of temporal part given above, namely an entity x that i) exists at, but only at a certain Δt , ii) that is part of another entity y at Δt and iii) that overlaps at Δt everything that is part of y at Δt . Suppose that endurantists may accept such a definition of temporal parts, and deny their existence; this would offer a defense of the definition of the debate between endurantism and perdurantism in terms of the existence of temporal parts. Endurantists should argue that there is no entity that i) exists at, but only at a certain Δt , ii) that is part of another entity y at Δt and iii) that overlaps at Δt everything that is part of y at Δt . If there are no such things, then endurantism is correct.

A better argument against the characterization of the endurantism-perdurantism debate in terms of the existence of temporal parts *tout court*, has been presented by Wasserman. According to this latter, perdurantism cannot be reduced to the ontological claim that ‘things have temporal parts’, for it would disregard a substantial explanatory claim, namely that ‘things persist *by having* temporal parts’.

⁴¹ Besides the attacks from the sceptics about metaphysical disputes in general – e.g. (Hirsch 2008a, 2008b) - the dispute between endurantism and perdurantism has been often criticized by metaphysicians too. See for instance (McCall and Lowe 2003, 2006), (K. Miller 2005), and (McGrath 2007), according to which the debate is merely verbal, and hence empty and not-legitimate. For a reply, see (Reydon 2008).

Lewis formulates perdurantism as the view that “something... persists by having different temporal parts, or stages, at different times.” (1986: 202) Crucially, this formulation includes the ‘by’-locution, which indicates an explanatory claim—to say that an object persists *by* having temporal parts is to say that facts about persistence are *grounded in*, or obtain *in virtue of*, facts about temporal parts. This conception of perdurantism goes beyond the ontological account since ontological claims are not, by themselves, explanatory. It is one thing to say that there are some gods who love pious objects; it is another thing to say that objects are pious because the gods love them. (Wasserman 2016)

Following the same principle, the claim that ‘things persist over time *and* they have temporal parts’ differs significantly from the claim that ‘things persist over time *because* they have temporal parts’, the first one committing to an *ontological conception* of perdurantism, whereas the second one commits to an *explanatory conception* of perdurantism. Similarly, it seems possible to distinguish an ontological conception of endurantism (things persist *and* they do not have temporal parts) and an explanatory conception of endurantism (i.e. things persist *not because* they have temporal parts). As things stand, Wasserman argues for two theses: i) that the ontological claim, concerning the existence of temporal parts, is not sufficient to account for the endurantist-perdurantist debate⁴², and ii) that the ontological conception of perdurantism is not able to account for a perdurantist approach *tout court* - for the existence of temporal parts is also accepted just by advocates of a stage theory (see below 1.3.3.).

Like endurantism, perdurantism has been preferred in virtue of the straightforward response it seems to provide to several arguments, such as the argument from anthropocentrism, the argument from vagueness, the argument from recombination, the argument from temporary intrinsics, and the argument from coincidence⁴³. Let us focus on the most prominent ones, namely the argument from temporary intrinsics, and the argument from coincidence.

(Lewis 1986a, 203–4) introduced the “problem of temporary intrinsics” (also called “problem of change”) to reject the standard endurantist way to account for change over time⁴⁴. Take a book, that was new and untouched a few months ago, but today it is doodled and has the edges chipped. Any theory of persistence ought to deal with cases like this latter, in which one and the same object has apparently incompatible properties at different times. Concerning one thing in two different states, change requires then both uniqueness and diversity⁴⁵. The endurantist solution to the problem of change

⁴² More precisely, taking endurantism as nothing but the denial of perdurantism, Wasserman argues that the debate between perdurantism and endurantism should be thought of “as a disagreement over whether a single theory – the perdurantist theory – is correct” (2016: 248), rather than a debate over two rival theories of persistence.

⁴³ For a good overview of the arguments, see (Magidor 2016).

⁴⁴ See also (Lewis 1988). For a discussion of the debate, see (Wasserman 2006) and (Hawley 2015).

⁴⁵ This is a very old problem, which goes back to Melissus (V century BC) and the famous Eleatic denial of change: “what is unique is always homogeneous with itself, and what is homogeneous can neither perish

consists in a relativization of properties to times: the apparent contradiction is hence solved by the fact that the same book has no contradictory properties, *being untouched-few-months-ago* and *doodled-today*.⁴⁶ The worries arising from such a relativization of properties to times concern the *intrinsicity* of properties as well as the existence of *simpliciter* properties. On the one hand, the relativization of properties to time seems to clash with the idea that there are properties that are naturally intrinsic (i.e. properties that object have not in virtue of some relation with something external to them, such as *being round*, or *being four*). But if properties are relative to times, then by saying (at a certain time t) that the plaza is round, we are attributing the property *being-round-at-t* to the plaza. It follows that even properties that seem intrinsic result at the end of the day relational properties. No intrinsic property is saved⁴⁷. On the other hand, the relativization of properties to times constitutes a threat for *simpliciter* properties, namely properties that are not in relation to times. Even accepting that by saying (at a certain time t) ‘the plaza is round’, we are attributing the property *being-round-at-t* to the plaza, still one may want to defend the existence of the property of being square *simpliciter*. Unfortunately, there is no easy way to endurantism. In contrast, perdurantism seems able to avoid these consequences by relativizing things (rather than properties) to times. Thus, perdurantism may account for the book being untouched few months ago and doodled today as follows. Let $B\text{-at-}t^{-10}$ be the temporal part of the book five months ago and $B\text{-at-}t^0$ the temporal part of the book today. According to perdurantism the book’s being untouched and doodled is not contradictory for *$B\text{-at-}t^{-10}$ is untouched* and *$B\text{-at-}t^0$ is doodled*, which is as contradictory as the fact that the same book has a red front-cover

nor grow nor change its arrangement [...] For anything that undergoes any change of whatever sort moves from one state into a different one. But nothing is different from what exists. Therefore, there will not change” (Simplicius, *Commentary on the Physics*, 103.13–104.15). For more recent analysis of change, see (Heller 1992), (Merricks 1994), (Hinchliff 1996), (Haslanger 2003), and (Wasserman 2006, 2018, chap. 6).

⁴⁶ Besides the relativization of properties to times, there are other ways for endurantists to account for change and the incompatible properties. One is presentism, the view that only present entities exist: no incompatibility of properties emerge if only present things exist, for the only property had by the object is the one it has *now*. If today the book is doodled, it is doodled full stop. Another solution is adverbialism, according to which things having properties in different ways explains the way things may have properties that are otherwise incompatible. It follows that the book has the property being-untouched *in a few-months-ago way*, and it has the property being-doodled *in a today-way*. For a presentist account of change, see (Merricks 1994) and (Zimmerman 1988), whereas forms of adverbialism have been proposed by (Lowe 1987), (Johnston 1987a) and (Haslanger 1989).

⁴⁷ According to some metaphysicians, intrinsicity is not a particularly strong worry for endurantists – see (Haslanger 1989), (Sider 2008, 246), and for a clear discussion (Magidor 2016, 519). First, endurantists may construe properties like ‘being round’ as intrinsic by defining intrinsic properties at a time t as properties that an object has at t merely in virtue of how that object is at that time. Second, endurantists may point out that perdurantists too face cases in which plausibly intrinsic properties cannot be relative to temporal parts: take for instance cases in which properties concern the whole perdurants (such as *being a person* or *being 80-years old*), and the relativization to temporal parts cannot be used. Third, endurantists may doubt that an (alleged) perdurant object has an intrinsic property P at t just in virtue of one of its temporal parts having P at t , for other aspects are required (e.g. the fact that such temporal part has the relation property of existing at t).

Since these issues are peripheral to my main concern here, I will not be investigating them further.

and blue back-cover. Change over time is similar to variation in space: just as the book may be said to change in space insofar as it has qualitatively different spatial parts, so it can be said to change in time insofar as it has qualitatively different temporal parts⁴⁸. Thus, since change consists in having different properties at different times, and since according to perdurantism having different properties at different times consists in having different temporal parts with those properties, temporal predication according to perdurantism results as follows:

(F@t) For any object x , property F , and time t , x is F at t only if x has a t -part that is F .⁴⁹

Avoiding the relativization of properties to times, perdurantism may defend an account of intrinsic properties as properties that are had by temporal parts in virtue of the way those temporal parts are, rather than in virtue of their relations. Besides that, perdurantism may account for simpliciter properties too, by referring to the properties of instantaneous (or very brief) temporal parts: thus, even if perduring objects may not have properties simpliciter, some objects do have them.

Another significant argument in favor of perdurantism is the argument from coincidence. Consider a Lump of clay created at t^0 , and a Statue created at t^1 with this Lump of clay and then destroyed at t^2 . Lasting for different periods of time, Lump and Statue are not identical, but entirely co-located for a period of time (from t^1 to t^2). In order to account for cases like this, endurantism needs to appeal to different strategies, such as the view that constitution is not identity⁵⁰, or the “mutual parthood” model of coincidence⁵¹, or the theory of abstract parts (e.g. forms), etc. On the other hand, perdurantism seems able to solve the worries related to the co-location, by arguing that the two objects share the temporal parts existing from t^1 to t^2 . It follows that although

⁴⁸ A common objection to the perdurantist account of temporal variation is that it rules out change from the world: in fact, neither the whole perdurant may be said to change, for it does not pass from one state to another (referring to the example above, the perdurant-book does not pass from being untouched to being doodled); nor the temporal parts do, for they remain untouched or doodled. On the idea that the variation of temporal parts is no real change, see (Simons 1987), (Oderberg 2004) and (McCall and Lowe 2009). For a reply, see (Quine 1981, 10) [“Time as a fourth dimension is still time, and differences along the fourth dimension are still changes; they are merely treated more simply and efficiently than they otherwise might be”]; and then (Heller 1992).

⁴⁹ Cf. (Armstrong 1983, 79; Lewis 1986a, 204; Hawley 2001, 13; Wasserman 2018, 193). (Sider 2001a, 57; Parsons 2005) reject (F@t) for it is plausible just as far as it is restricted to qualitative properties (color, shape, weight, etc.), whereas it is problematic for other properties, like sortals (e.g. being a table, or being a person, etc – see also (Hudson 2001, chap. 4)) and historical properties. Restricting the focus on persons and qualitative properties, (Wasserman 2018, 193–94) advances the following weaker principle:

(F@r): For any person x , qualitative property F , and region r , x is F at r only if [...] x has a person-part at r that is F .

⁵⁰ Advocates of the so called “constitution view”, according to which constitution is not identity, are, among others, (Wiggins 1980), (Lowe 1983), (Thomson 1983, 1998), (Simons 1987), (Johnston 1992a), (Baker 1997, 2000, 2007), (Fine 2003), and (Koslicki 2004).

⁵¹ On the way the mutual parthood model of coincidence may be used by endurantists – defended in particular by (Thomson 1983, 1998) - see (Sider 2001a, 155) and (Wasserman 2002).

co-located for a period of time, the objects are distinguished because there are parts that they do not share, which make them not identical.

Having defined perdurantism, let us go back to the formulation of the persistence question (1). Can we accept (1) from a perdurantist perspective? No. The reason is simple. In (1) the question of persistence was formulated in terms of the identity between x and y . However, according to a perdurantist account, personal persistence should not require that x is identical to y . Existing at different times, they are two different (i.e. not numerically identical) temporal parts. What a perdurantist want to know dealing with personal persistence is rather whether two different temporal parts are *parts of the same person*.⁵² As things stand, the persistence question characterized as (1) above takes the following form (1P)

(1P) Let x be an entity that exists at time t^1 and y an entity that exists at t^2 [where i) $t^1 \neq t^2$ and ii) x is a temporal part of perdurant person or y is a temporal part of a perdurant person]. Necessarily, x and y are parts of the same perdurant if and only if $\Phi(x,y)$.

Two aspects are worth consideration. Although (1P) still concerns the constitutive conditions of persistence (i.e. the informative, necessary and sufficient conditions of persistence), it does not concern, strictly speaking, any constitutive condition of *numerical identity over time*. In fact, in (1P) Φ is no constitutive condition of the numerical identity between x and y , for x and y are numerically different. Rather, Φ is the constitutive condition of x and y being parts of the same perdurant person: it is the constitutive condition of their being unified into the same perdurant, namely the *constitutive condition of diachronic composition*⁵³.

Second, in (1P) there is no commitment concerning x 's or y 's being a person - which is a condition of (1), as we have seen above in section 1.1. Besides the fact this condition would not account for cases in which a person has more stages that do not belong to the kind "person" (take for instance two stages of Gregor Samsa after being transformed in a cockroach)⁵⁴, the main reason is that it misses the very idea of perdurantism, i.e. the

⁵² See (Lewis 1971, 203): "The so-called 'problem of personal identity' is the problem of explicating the relation of personal unity between stages".

⁵³ Although commonly treated together (see (Lewis 1976a) and (Perry 1975, 8–9)), some recent studies argue for substantial difference between conditions of diachronic composition and conditions of identity over time - see (Sattig 2008).

⁵⁴ This difficulty may be in fact overcome by appealing to (1**), rather than (1) - see section 1.1 above, so that the following (P1*) results:

(1P*) Let x be an entity that exists at time t^1 and y an entity that exists at t^2 [where i) $t^1 \neq t^2$ and ii) x is a temporal part of perdurant person or y is a temporal part of a *perdurant person or there is a z at t^3 ($t^3 \neq t^1 \neq t^2$) such that z is a temporal part of perdurant person and $\Phi(x,y)$ and $\Phi(z,y)$]. Necessarily, x and y are parts of the same perdurant if and only if $\Phi(x,y)$.*

However, as for the case of (1**) discussed above, I will continue referring to (1P) which is easier to deal with, although this adjustment of the persistence question for persons ought to be considered when

idea that the person is the *perdurant person*. I will say more in elucidation of these points in see section 1.5. below; but that will suffice for the moment as a specification of this issue.

1.3.3. Stage theory

Like perdurantism, and against endurantism, there is another view that accepts the existence of temporal parts⁵⁵, the so-called *stage-theory* (or “exdurantism”, or “stage-theoretic four-dimensionalism”). This view is popular among advocates of a temporal parts ontology⁵⁶ (maybe even more popular than Lewisian perdurantism), attracting and being defended by several perdurantist-born metaphysicians⁵⁷. The main differences between perdurantism and stage theory may be summed up in two claims: i) stages are instantaneous entities (provided that not-instantaneous entities are not atomic, being hence further divisible)⁵⁸; and ii) ordinary objects are those instantaneous entities. According to a stage theoretic account, thus, things do not persist over time (at least in a strict sense). The world is a world of stages, or, using Sider’s slogan, “all the world is a stage” (Sider 1996). Claiming that composition over time never occurs, stage theory is a nihilist approach to diachronic composition: whatever stages at different times one picks out, it is never the case that they compose a complex entity, which persists over time. It follows that the alleged objects persisting over time have no ontological status, for no unity relation obtains among stages at different times. Let me clarify two things on this point. First, my only concern here is diachronic composition, namely composition of entities that are located at different times; this is the kind of composition that stage theory rejects. Nonetheless, a stage theory does not seem committed to a nihilist account of composition *tout court*, being compatible with different accounts of composition *synchronically* (e.g. unrestricted composition, or moderatism about composition). I would have more to say in elucidation of these points, but I cannot pursue this issue here.

dealing with some extreme cases, in which neither of the temporal part is properly a part of perdurant person.

⁵⁵ Let me notice in passage that such a characterization of stage theory as a theory committed to the existence of temporal parts may be misleading, for the very notion of ‘temporal part’ refers to entities that are *parts of something else*. But since according to a stage theory (at least in its austere version) there is no “something else” of which the momentary entities are parts, it might be better to refer to temporal *stages* rather than to temporal *parts*. Nonetheless, since the literature commonly associate perdurantism and stage theory as approaches sharing an ontology of temporal parts (referring to temporal parts and stages as synonyms), I will use the notion of temporal parts for stage theory too.

⁵⁶ (Sider 1996, 2001a), (Hawley 2001), and (Varzi 2003) offer a defense of stage-theory. For the notion of ‘exdurantism’ see (Balashov 2007).

⁵⁷ (Sider 2001a, 140) “While I agree that the worm view gives a good account of the puzzles, I think that the best account is that of the stage view, according to which ordinary objects are momentary stages.”

⁵⁸ It is worth pointing out that this claim rests upon the denial of temporal extended simples, i.e. entities that have no proper temporal parts but are exactly located at regions that have proper temporal parts. On extended simples see footnote 67 below.

Second, it should be noticed that the stage theory as originally proposed (cf. (Sider 2001a; Hawley 2001)) does accept the existence of perdurant entities – i.e. the “space-temporal worms” – along with the stages. This version of stage theory seems to differ from standard perdurantism mainly for semantic reasons. In other words, it is difficult to see how the stage theoretic view and the perdurantist one differ on the metaphysical level. They both agree with respect to the ontology although they disagree on what makes true certain sentences. For instance, according to the stage theorist ‘Valerio is a person’ uttered at time *t* is true because the stage of Valerio at *t* is a person, whereas according to a perdurantist the same sentence is made true by the whole fourdimensional entity. In the rest of my work, I will not appeal to this traditional account of stage theory, but rather to a more austere version. According to what I will call *austere stage theory* – see (Sider 2013) – diachronic composition never occurs. Hence persons are not fourdimensional worms; each person is an instantaneous entity.

Even considering the most austere and parsimonious stage theoretic approach, its advocates still want to say that there is a relation among stages, namely the relation of *temporal counterparthood*. The relation of temporal counterparthood is a particular kind of counterparthood relation⁵⁹, namely a relation of similarity among entities at different times. It is easy to find countless passages in which counterparthood is defined in terms of similarity. Let me just quote one given by Lewis⁶⁰:

[...] the counterpart relation is a relation of similarity. *X*’s counterparts in other worlds are all and only those things which resemble *X* closely enough in important respects, and more closely than do the other things in their worlds. (Lewis 1971, 205–6)

According to stage theory, when we refer to a ship, or a person, or any material object, we do not refer to an object extended over time, but rather to a very specific stage, that exists at a very specific time. Hence, when we refer to something as ‘the ship in the past’ or ‘me in the future’, we are not referring to a different part of the ship or of myself (parts that are respectively in the past and in the future), but instead to some counterparts of the ship or to some counterparts of myself. Counterparts are also the truthmakers for any sentences concerning the past and future of present things: sentences such as “the ship crossed the ocean two weeks ago” or “I will be happy as soon as I’ll see you

⁵⁹ The method of counterparts has been first developed in the analysis of modal logic (e.g. to account for *de re* modal predications – see (Lewis 1968, 1971, 1986a, chap. 4)) and hence to account for identity across possible worlds. “To say that something here in our actual world is such that it might have done so-and-so is not to say that there is a possible world in which that thing *itself* does so-and-so, but that there is a world in which a *counterpart* of that thing does so-and-so. To say that I am such that I might have been a Republican, but I am not such that I might have been a cockatrice, is to say that in some world I have a counterpart who is a Republican, but in no world do I have a counterpart who is a cockatrice” (Lewis 1971, 205).

⁶⁰ Note that although I refer to Lewis’s account of counterparthood and temporal counterparthood, I am not suggesting that Lewis defended a stage theory. I will say more about the way temporal counterparthood has been used by Lewis to argue in favor of its perdurantist approach in section 1.8.2. below.

tomorrow” are made true or false by the behavior of the counterparts of the ship two weeks ago and my counterpart tomorrow. A temporal counterpart theory of tensed assertion and thus a stage theoretic account of persistence has been defended by Sider, who claims that

“[a] temporal counterpart of a person (stage) is another person (stage) to which she is appropriately related. *The question of the nature of this counterpart relation is precisely the question of the correct criterion of personal identity.* Someone who believes the psychological continuity theory will say that the counterparts of a person stage, S, are those stages with which S is psychologically continuous; the bodily continuity theorist will say instead that S’s counterparts are stages with which S is bodily-continuous. The question of who is right is the question of which temporal counterpart relation takes part in the correct truth conditions for the claims about persisting persons we make in ordinary speech” (Sider 2001b, 193, my italics).

As things stand, one may be tempted to say that a stage theory does not deny persistence, accounting rather for persistence in terms of counterparthood. It follows that there is a way in which persistence is still accounted by a stage theory, even though in a loose sense (let me refer to this kind of persistence with “persistence*”, where things persist* over time by bearing a temporal counterpart relation to numerically distinct stages located at different times).

Thus, according to stage theory, the persistence question as the question about the conditions of persistence*, takes the following form (1ST)

(1ST) Let x be an entity that exists at time t^1 and y an entity that exists at t^2 [where i) $t^1 \neq t^2$ and ii) $Px \vee Py$]. Necessarily, x is *the temporal counterpart of y* if and only if $\Phi(x,y)$.

Although I may agree that this is the way stage theory has been conceived (see (Hawley 2001; Sider 2001a; Gilmore 2008), I doubt that it does account for the notion of persistence, even a very loose way. This rests upon the very basic and widely accepted characterization of persistence in terms of “existence at multiple times”. The idea is that since things in an exdurantist world are instantaneous entities, there is nothing that exists at multiples times. And if existence at multiples times captures the very basic idea of persistence, it follows that nothing persists according to a stage view. Thus, the stage view can be rightly characterized as a sort of error theory about the persistence of things over time.

Arguments in support of a stage theoretic view concern its solutions to some problematic cases already discussed above, such as the puzzle of coincidence and the problem of temporary intrinsics. Like perdurantism, a stage theory can in fact refer to the notion of temporal parts (or stages) to avoid puzzling scenarios concerning composition and to account for opposed properties at different times. As should be clear now, in both cases the main difference with perdurantism rests upon the fact that stage theory does

not allow for any object to be composed of more than one temporal part. On the one hand, dealing with cases of coincidence, such as the statue-lump of clay one, stage theorists may argue that “statue” and “lump” refer to instantaneous objects, and that they are indeed identical. It is by appealing to a temporal-counterpart theory that stage theorists are then able to account for truth of sentences such as “the lump of clay was created at t^0 ” or “the statue was created at t^1 ”. In other words, a stage theoretic account is able to solve cases of coincidence and avoid error theory thanks to temporal-part construals, arguing that instantaneous objects - rather than continuants - are the referents of ordinary terms. On the other hand, stage theorists may solve the problem of temporary intrinsics by denying change over time. Like perdurantism, stage theorists reject the relativization of properties to times, invoked by endurantists, appealing to instantaneous stages (that is a relativization of things to times). As things stand, the untouched book a few months ago and the doodled book today are two distinct entities. And since there is nothing being both untouched and doodled - not even a four-dimensional object extended over time – the whole problem of change (as well as change itself) disappears.

Since the literature on these issues has become quite extensive, and since my purpose here is just to introduce the reader to the main variants of theories of persistence, I shall not attempt a full discussion of the strength and problems of a stage theoretic account here. (For further reading, see (Sider 2000, 2001a, chap. 4.6) and (Hawley 2001, chap. 1)).

Before proceeding with the analysis of the way a temporal part ontology can be applied to persons and issues on the way we persist, let me spend some words on a different account of theories of persistence, based on locative issues.

1.4. The metaphysics of persistence: the locative account

Although the distinction between endurantism and perdurantism still remains tied to issues concerning the existence of temporal parts and their explanatory role for persistence, in the past few years some have suggested that persistence can be understood in terms of location. According to what may be called the *locative* conception of persistence, or “locative turn” of persistence⁶¹, the persistence of objects must be formulated in terms of the way objects are located in (or extended through) time (cf. Gilmore 2006, 2008). The underlying idea is that persisting is a matter of how continuants are located in time, rather than a matter of whether they have temporal parts: it follows that the distinction between endurantism and perdurantism concerns crucially locational rather than mereological notions.

⁶¹ For discussion on what (Costa 2017) calls “the locative turn” of the debate about persistence, see (Hudson 2001), (Gilmore 2006, 2007, 2008, 2018), (Sattig 2006), (Parsons 2007), and (Donnelly 2011).

Expanding the idea of location from the spatial case to the temporal and spatiotemporal ones, the development of this new way to understand persistence may be related to the shift from the conception of a three-dimensional space to that of a four-dimensional spacetime. Take for instance the notion of *exact location*, which can be understood in a neutral way as the relation between an entity x and a region r of a dimension d that holds just in case x and r have the same shape, boundaries, and size, and stand in the same distance relations in d with other entities.⁶² As the *exact spatial location* of a statue is the spatial region s where the statue perfectly fits and is as distant to everything else as the statue is, the *exact temporal location* of an entity such as a football match is the 90 minutes interval of time $\Delta_{t_1-t_2}$ spanning from the beginning of the match at t_1 to its end at t_2 (set aside the 15 minutes pause between the first and the second half)⁶³. Since the match and the interval of time share the same shape, boundaries, and size, and stand in the same temporal distance relations with other entities, the exact temporal location of the match is $\Delta_{t_1-t_2}$. Similarly, the exact temporal location of an instantaneous entity x is the instantaneous region t such that x and t share the same shape⁶⁴, boundaries, and size, and stand in the same distance relations with other entities in time.

Different theories of persistence emerge as soon as the temporal location of material objects is concerned. In fact, although it is commonly accepted that material objects are located in time, there is a significant disagreement on the regions of time at which these objects are exactly located. On the one hand, some think that objects do not have a unique exact location, for they are located at several regions. According to this account, objects are multilocalized, for they have several exact locations during their existence. Their exact locations are all and only the locations included in the interval of their existence, from their creation to their annihilation. Let O be a material object created at t_1 and destroyed at t_{10} . The exact locations of O are all the instants included between t_1 and t_{10} , namely $t_1, t_2, t_3, \dots, t_{10}$. This is the *multilocationist* thesis. On the other hand, one may claim that material objects do have a unique exact temporal location. The exact location of a material object O persisting from t_1 to t_{10} , is the interval of its persistence. In other words, the exact location of an object O created at t_1 and destroyed at t_{10} is the

⁶² Besides 'exact location', the relation of 'weak location' is defined as the relation between an entity x and any region r of a dimension d that holds just in case r is not completely free of x (or, mereologically speaking, x is weak located in r if r is a region that overlaps the exact location of x). See (Parsons 2007, 203), (Gilmore 2008, 1128) and (Costa 2017, 59).

⁶³ I will almost exclusively focus on the temporal (rather than spatio-temporal) formulation, since nothing crucial hinges on which formulation I choose.

⁶⁴ Since the time is mono-dimensional, the shape of a temporal region reduces to whether the region is extended (it is an interval) or not (it is an instant). Discontinuous (i.e., the shape of the event that encompasses all world wars so far) or "mixed" shapes (the shape of the mereological sum of an event and a disjointed interval) are also possible but they won't concern us here.

region $\Delta_{t_1-t_{10}}$, that has as boundaries O 's creation and O 's destruction. This is the *unilocationist* thesis.

The locative turn of the endurantism/perdurantism debate consists in considering “locative and mereological issues as related but separated” (Costa 2017, 57). A first way to understand the idea of bringing in considerations about location in the debate about persistence is to consider claims about location as *characterizing* ways of persistence. In other terms, the opposition between the endurantist and the perdurantist should not be seen as confined to a disagreement on whether continuants have temporal parts, but also on whether continuants are exactly uni- or multi-located in time.

Some qualifications are in order. Firstly, it would be a mistake to straightforwardly identify the dispute about endurantism/perdurantism and the dispute about multilocationism/unilocationism, since their subject matter differs: the first is a dispute about the existence of temporal parts of continuants, the second is a dispute about the way continuants are located in time⁶⁵. However, appealing to locational theses can help to face certain charges of obscurity that seem to plague the endurantism/perdurantism distinction if formulated merely in mereological terms: take for instance the notion of ‘temporal part’⁶⁶, or the notion of ‘being wholly present’, which have been both strongly criticized because obscure (see above section 1.3.1.).

Characterizing endurantism and perdurantism through their commitments to distinctive theses about location, in contrast, is a way to account for both views in a positive way. More precisely, the endurantist is (or should be) committed to the multilocal thesis (i.e., objects are exactly located at all the instants at which they exist), while the perdurantist is (or should be) committed to the unilocationist thesis (i.e., objects are exactly located at the interval in which they persist). This seems to be the idea behind the distinction between *locational endurantism* and *locational perdurantism*.

[...] the dispute between locational endurantism and perdurantism emerges as a genuine issue, entirely orthogonal to the debate about temporal parts, at least from a narrowly logical point of view. Say that a thing locationally endures just in case it persists and exactly occupies only achronal [instantaneous] regions, and say that a thing locationally perdures just in case it persists and exactly occupies one and only one region. [...] Then locational endurantism can be stated as the view that all persisting material objects locationally endure, and locational perdurantism as the view that all persisting material objects locationally perdure. (Gilmore 2008, 1229)

⁶⁵ As Costa correctly points out “The end-/perdurantism dispute concerns the having or not having of temporal parts, whereas the uni-/multilocationism dispute concerns the exact temporal location and shape of an entity. [...] There are two disputes: the locative dispute between uni- and multilocationists, and the mereological dispute between end- and perdurantism.” (Costa 2017, 62).

⁶⁶ Criticized among others by (Thomson 1983), (van Inwagen 2000), (Lowe 2009), (McCall and Lowe 2003, 2006) and (K. Miller 2005).

Secondly, locational endurantism and locational perdurantism capture a consequence of the traditional understanding of endurantism and perdurantism, but there is at least one version of mereological endurantism, which does not have such a consequence—this is the so called “simplism”⁶⁷. Traditionally, the distinction between endurantism and perdurantism has been understood also as a distinction between a *three-dimensional* view of objects and a *four-dimensional* view of objects. The adjectives “three-dimensional” and “four-dimensional” refer to the spatiotemporal shape of objects. The reason why the labels have been used almost interchangeably is that three-dimensionalism and four-dimensionalism have been taken as important, characterizing consequences of endurantism and perdurantism respectively. The idea is that if an object has temporal parts, then it is *extended* along the temporal dimension, and hence it has four dimensions. Whereas if an object lacks temporal parts, then it is merely extended through the three dimensions of space, and thus it is a three-dimensional entity.

Multilocationism and unilocationism, together with certain rather natural assumptions, entail precisely those two consequences of endurantism and perdurantism traditionally conceived. The multilocal thesis, together with the thesis that if an object is multilocal in time, then it is exactly located at instants and not at intervals, entails three-dimensionalism. The unilocal thesis, together with the thesis that if an entity exists during an interval of time, then it is (weakly) located at all the instants that constitute the interval, entails four-dimensionalism⁶⁸. Now, one may be tempted to move from the entailment from unilocationism (continuants have only one exact location in spacetime) to four-dimensionalism (continuants are temporally extended), to one from four-dimensionalism to perdurantism (continuants have temporal parts). Notice that in that way, we could both maintain that the endurantism/perdurantism debate is an important one about the existence of temporal parts of continuants, and that it is a disagreement between two opposite views of persistence, rather than a disagreement on whether a certain account of persistence holds.

However, in order to conclude that continuants have temporal parts from the thesis that they are spatially extended, we need the further assumption that if an entity is extended along a dimension, it has parts along that dimension, and this “doctrine of arbitrary undetached parts”⁶⁹ is precisely what simplism denies. According to simplism,

⁶⁷ For a defense of simplism based on the theory of extended simples, i.e. simple entities with complex exact location, see (Parsons 2000, 2007); for further discussion on extended simples, see also (Markosian 1998b), (McDaniel 2007), (Noonan 2009), and (K. Miller 2009). Extended simples have been strongly criticized and rejected by those philosophers who think that extension implies mereological composition – e.g. (Casati and Varzi 1996, 1999), (Sider 1997), (Braddon-Mitchell and Miller 2006a), (Hofweber and Velleman 2011). (Braddon-Mitchell and Miller 2006a) offer a defense of extended simples. (Hawthorne 2006) discusses endurants-like views that are (at least apparently) consistent with the existence of temporal parts; whereas (Carlson 2017) argues in favor of a nihilist perdurantism (temporal parts without spatial parts).

⁶⁸ In both cases we also have to make the general assumption that continuants have at least three spatial dimensions.

⁶⁹ The doctrine of arbitrary undetached parts has been firstly discussed and rejected by (van Inwagen 1981). On this issue, see also (Carter 1983), (Heller 1990, 2–4), (Burke 1994b), and more recently (Varzi 2013).

both regions of space time and their occupants can be extended simple. Thus, a continuant can be temporally extended without having temporal parts. The traditional understanding of endurantism, that is the claim that continuants do not have temporal parts, is thus compatible with unilocationism.

At the end of the day, it seems that mereological and locational features are interestingly related, but what theses should be used to characterize the debate about the nature of continuants seems to be in large part a matter of focus of interest. On the one hand, mereological endurantism and perdurantism explain persistence by focusing on mereological issues, whereas on the other hand locational endurantism and locational perdurantism explain persistence by focusing on locative issues.

Mereological Endurantism: continuants persist by being⁷⁰ wholly present at all and only the instants included in the interval of their persistence.⁷¹

Mereological Perdurantism: continuants persist by having temporal parts existing at all and only the instants included in the interval of their persistence.

Locational Endurantism: continuants persist by having several exact temporal locations (i.e. they persist by being exactly located at all and only the instants included in the interval of their persistence).

Locational Perdurantism: continuants persist by having only one exact temporal location (i.e. they persist by being exactly located at the interval of their persistence).

As things stand, it seems that strictly speaking being a four-dimensional entity does not entail having temporal parts, since things could extend over time just as extended simple may extend in space without having any proper parts. There may well be other considerations concerning a locational account of theories of persistence, as well as its relations with a mereological account. Nonetheless, since my concern is with a mereological account, and more specifically with the way temporal parts of persons are connected over time, in what follows I will focus on these latter issues⁷².

⁷⁰ On the explanatory account of theories of persistence, see (Wasserman 2016) and section 1.3.2. above.

⁷¹ For reasons that I have already hinted at, the intelligibility of mereological endurantism in terms of “being wholly present” is problematic, and many philosophers would agree that it should be substituted by the negative formulation below:

Mereological Endurantism(-): it is not the case that continuants persist *by having* temporal parts existing at all and only the instant included in the interval of their persistence.

However, in so doing, we also renounce to see the distinction between endurantism and perdurantism as an opposition between two explanations of what persistence is. In this respect, the locational formulation seems more desirable.

⁷² For further reading, however, see (Buonomo and Torrenzo manuscript).

1.5. Temporal parts of persons

1.5.1. What is a temporal part of person?

The notion of “temporal part” has been strongly criticized by several endurantists: J. J. Thomson defined temporal parts a “crazy metaphysics” (Thomson 1983: 210-13), and similar worries have been advanced by (Rea 1998), (van Inwagen 2000), and (Lowe 2009). This latter argued that the concept of temporal part is nothing but the result of an “extravagant and contentious doctrine” (Lowe 2009, 132), which would commit us to accept contradictory entities such as atom-stages or quark-stages, and hence some odd kinds of parts of indivisible physical particles⁷³. Several replies have been advanced, but here I will focus on the one suggested by (Heller 1990, 14ff). According to Heller, in response to (Thomson 1983), an ontology of temporal parts would result as a crazy metaphysics only if we want to understand such entities within an endurantist framework, namely considering the whole objects as enduring continuants.

Additionally, the existence of temporal parts becomes even more suspicious as soon as we consider the case of people. In fact, even accepting the possibility of temporal parts for objects, one may argue that people do not have such temporal parts⁷⁴. How can we accept that we are composed of temporal parts, which compose “four-dimensional worms”? Why should we accept that there is only a part of us at any time in which we persist, rather than an entity, that persist through time as a whole (an entity that is strictly identical over time)? Moreover, an endurantist account of persons seems to fit better with the concern we have for our own future, as well as the pride or shame for our own

⁷³ And he continues: “I find the very notion that things such as tables, trees, and indeed persons have ‘stages’ or ‘time-slices’ at best ontologically extravagant and at worst doubtfully comprehensible” (Lowe 2009, 137).

⁷⁴ This approach appears in a way similar to the account defended by (Chisholm 1976), based on the distinction between *entia per se* and *entia successiva* (or *per alio*). According to Chisholm, on the one hand ordinary objects are *entia successiva*, i.e. things composed by some more fundamental entities, and those identity over time only obtains in a loose sense, since they change the parts composing them continuously. On the other hand, persons are *entia per se*, i.e. entities that do not need any further entity in order to exist, and whose persistence consists in their enduring over time. Although Chisholm’s account of ordinary objects has been widely understood in terms of a stage theoretic view applied to these objects, I think this is a misleading interpretation of his approach, being rather a compromise between Humeanism (according to which the persistence of ordinary objects is a fiction) and endurantism (applied to all *entia per se*, i.e. persons and the fundamental entities composing ordinary objects). As things stand, Chisholm account of persistence would result endurantist both for persons and ordinary objects; no temporal parts would emerge in his picture. The only difference would be that if persons (as *entia per se*) persist in virtue of the fact that *they* endure, ordinary objects either persist only in a loose sense, since they constantly change their fundamental enduring constituents (fundamental particles?), or they persist in a strict sense only if they do not change any enduring constituent. Otherwise said, the distinction between *entia per se* and *entia per alio* results based on the fact that the latter, but not the former, obeys mereological essentialism. *Entia per se* can change their parts and continue to exist, whereas the *entia successiva* (as mere fusions) cannot change parts and continue to exist.

past actions: to account for ordinary things like that, one may argue, we should accept that we persist through time as wholly present at any instant in which we exist.

Nonetheless, some may disagree, arguing that things like our willingness to follow some plans decided by past selves, or to sacrifice our present for some future selves can be explained by perdurantism too, being no prerogative of endurantism. One strategy to account for this kind of situations would be to say that it is the entire four-dimensional entity – rather than the temporal parts - that follows plans, makes sacrifices, has concerns for her future, etc. The temporal parts of a four-dimensional person are the instrument used by these latter to achieve her aims, so that one temporal part’s pride, shame, willingness to sacrifice, etc. for a different temporal part may be explained by focusing on the whole and self-identical four-dimensional person. A second strategy consists in focusing on the intimate relations between distinct temporal parts of the same person: although accepting that temporal parts themselves (rather than the whole four-dimensional person) are pride, shameful, willing to sacrifice, etc., this view explains all past- and future-oriented actions referring to the strict and intimate relation among temporal parts. I would have more to say in elucidation of these issues: but that will suffice for the moment as a specification of the debate.

In order to defend a perdurantist account of persistence for persons, and then to find a way to characterize the criteria of identity for persons as four-dimensional entities, we should start by defining the notion of “temporal part of person”, also called “person-stage” – see (Lewis 1976a, 23–24, 1976b, 147–48) and (Sider 2001a, 101).⁷⁵ Given the definition of temporal part above (1.3.2.), I see three possible ways to define a temporal part of person, namely:

- 1) X is a temporal part of person iff (i) x is a temporal part of y at Δt , and (ii) x is a person.
- 2) X is a temporal part of person iff (i) x is a temporal part of y at Δt , and (ii) y is a person.
- 3) X is a temporal part of person iff (i) x is a temporal part of y at Δt , (ii) x is a person, and (iii) y is a person.

⁷⁵ Let me notice that (Sider 2001a, 101) actually distinguishes ‘person-stage’ from ‘temporal part (of person)’, for he defines a person-stage as a “person-like part of a temporal part”. Although a person-stage usually coincide with the temporal part it is part of, there are cases in which this is not the case (see the time travel case). (Wasserman 2018, 194–96) replies to Sider, defining person-stages (or ‘person-parts’) as follows: “x is a person-part of y at r =df (i) x is part of y at r, (ii) x is person-like, and (iii) x is a member of a set of R-related person-like objects that compose y.” (p. 196). In a recent paper, Johnston introduced the notion of “personite”, that appears a different way to talk about extended temporal parts - cf. (Johnston 2016, 2017). However, although he recognizes that “the existence of personites is most obvious on the four-dimensionalist account” (p. 199), personites are intended to be compatible with any theory of persistence. If so, temporal parts are nothing but some specific personites, namely the personites within a four-dimensionalist framework. Similar considerations may be advanced referring to the notion of “homunculi”, that are tiny persons embedded within ordinary one - see (Gilmore 2017).

The definition I will use in the rest of my work is 2), which is the weakest definition of temporal part of person on the market. 2), in fact, only requires that the four-dimensional entity y of which the temporal part x is a part, is a person. No restriction is required to the temporal part x itself. In contrast, 1) requires that the temporal part itself is a person, rather than the entire four-dimensional entity⁷⁶. Besides the fact that such an understanding of temporal part of person does not say anything on the entire entity (should it be person too? If not, what is it?), 1) has the unlikely consequence that it is committed to an essentialist account of persistence, that as I argued in section 1.1 above, should be better avoided⁷⁷. For the same reason, I would discard 3) as well, that although carefully defines the four-dimensional entity as a person, is also committed to an essentialist account of person. This is hence the definition of temporal part of person that I will consider.

TEMPORAL PART OF PERSON=_{df} (i) x is a temporal part of y at Δt , and (ii) y is a person.

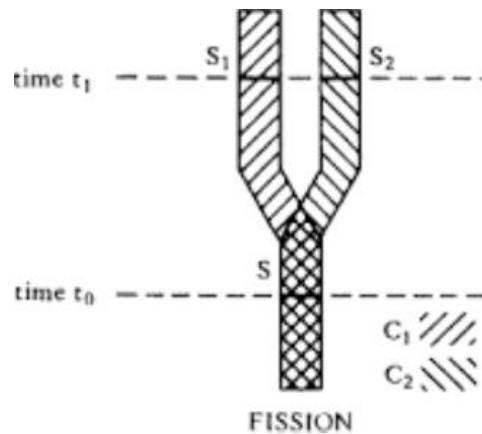
1.5.2. Some advantages of an ontology of temporal parts of persons

Introduced the notion of temporal parts of persons, one may still wonder why we ought to prefer such an account of personal persistence. There are two cases in which an ontology of temporal parts is usually said to offer a better explanation, namely i) the case of fission and ii) the case of graduality.

i) Let S be a pre-fission entity at t^0 , and S_1 and S_2 the products of its fission at t^1 (see figure below). Suppose that S is a person, that the fission occurring is symmetric (i.e. both S_1 and S_2 are equally continuous with S ; e.g. S and S_1 are as psychologically continuous as S and S_2 are), and that the relation between the pre-fission entity and the products of fission respectively is the condition of identity over time. It follows that S is identical both to S_1 and to S_2 . However, if $S = S_1$ and $S = S_2$, it follows from the principle of transitivity of identity that $S_1 = S_2$. But S_1 and S_2 are not (numerically) identical, since S_1 and S_2 are located at two distinct regions of space, and thus numerically distinct since we do not have reasons to think that this is a case of multilocation.

⁷⁶ Since it is reasonable to think that something composed by temporal parts that belong to the kind “person” compose a four-dimensional entity that in turn belongs to that kind, one may argue that 1) actually entails 3). Since this issue is peripheral to my main concern here, I will not be investigating it further.

⁷⁷ I notice in passage that Lewis’s definition of “person-stage”, although primitive, seems to tend for 1), rather than 2. This is for instance the way (Gilmore 2017, 55) explains the Lewisian notion of person-stage, as “an instantaneous or very short-lived entity that is sufficiently person-like, especially with regard to its psychological profile”. However, I will not discuss this issue further, being no threat for the account I am proposing.



Setting aside the denial of transitivity of identity (which is a too high cost for any account of personal persistence), one possible solution to this problem consists in the idea that identity is brute and not analyzable. This way, even if fission is symmetric and the same relation holds between S and S_1 and between S and S_2 , S 's being identical either to S_1 or to S_2 is a primitive fact, which is not reducible to any further aspect. Fission cases would offer then an argument in defense of an anti-criterialist account of persistence, which rejects any constitutive condition of personal persistence (see above section 1.2.). Still, there is a further way fission cases may be explained, and this way rests upon the commitment to a perdurantist approach to personal persistence. Given a perdurantist account of personal persistence, S , S_1 , and S_2 are temporal parts of persons existing at different times and constituting two continuant persons (S - S_1 and S - S_2), which share the temporal part S . Since the relation between the temporal part S and the temporal parts S_1 and S_2 respectively is a relation of unity, which is one-to many and not transitive,⁷⁸ no unity between S_1 and S_2 is entailed. As things stand, a perdurantist account of persistence solves the puzzle of fission by accounting for it in terms of two continuant persons which share some person stages before the fission (rather than in terms of one person that divides into two persons)⁷⁹.

⁷⁸ For a defense of such a perdurantist account of fission, see (Perry 1972) and (Lewis 1976a, 24–25), whereas (Merricks 1997) criticizes it.

⁷⁹ The same strategy can be applied to reverse cases of fusion, in which two persons are somehow unified into one. (Shoemaker 1963) offers a famous example: suppose that Brown's cerebrum is transplanted into Robinson's cranium, that the survivor of the operation is called Brownson, and assume that Brown's memories are transferred to Brownson. We may wonder: is Brownson Brown, Robinson, or neither? How many individuals are there on bed after the fusion of Brown's cerebrum and Robinson's body? The standard perdurantist approach would commit us to say there are two persons, sharing some temporal parts. Both Brown and Robinson have an extended temporal part lying in bed after the operation, Brownson; but neither Brown nor Robinson is wholly there in bed, since they are extended through different four-dimensional regions. This is intended to meet both our intuition that there is only one individual after the operation (constituted by the temporal parts called Brownson) and our intuition that both Brown and Robinson persist after the operation, occupying different four-dimensional regions.

ii) Another advantage of a perdurantist account of personal persistence is the fact that it offers a solution of the so-called problem of graduality⁸⁰. Let me use an example. Consider two persons, John and Saul. Suppose we accept a mentalist account of personal identity over time, according to which the continuity of memories constitutes the persistence of persons. Imagine that in a series of operations all memories in John's brain are replaced with Saul's memories, and vice versa.⁸¹ Suppose also that during every single operation nothing but a very small memory is removed from John's brain and transplanted into Saul's. Given the condition of persistence above, it seems reasonable to accept that after a few operations John and Saul still exist where they were at the beginning of the operation (say John in Bed1 and Saul in Bed2), even if some of their memories have been changed. In the same way, it seems reasonable to say that at the end of the series of operations we will find Saul laying in Bed1 and John in Bed2. But what if we take a moment in the middle of the series of operations, which is equally separated from the beginning and the end of the series? Where is John and where is Saul? Are they still lying in their original beds? At first sight, the problem seems to concern a kind of vagueness, the difficulty of such a case consisting in the specification of a threshold demarcating the moment in which John is replaced by Saul (and vice versa). However, this is not the real problem. In fact, even if we accept the existence of a super-determinate condition of personal identity over time (i.e. a very precise condition of persistence, such as *having n-memories*), identity would still be a matter of degree.⁸² To see why, let t^{**} be a precise moment in which the person in Bed1 is not John anymore, and let t^1 and t^2 be two moments, such that t^1 is sufficiently close to the beginning of the series of operations and t^2 is sufficiently close to t^{**} . Since John at t^2 is less continuous to John at the beginning of the operations (hereafter John-0) than this latter is with respect to John at t^1 , it follows that John-0 is *more identical* to John at t^1 than he is to John at t^2 . But how is it possible that a person is more or less identical to himself? Should we accept cases of partial personal identity over time? In a nutshell, the problem is that since any sort of continuity or connectedness might be more or less satisfied (e.g. A at t^1 and B at t^2 might be more or less psychologically continuous), any condition of personal persistence seems to entail that identity is a matter of degree. However, identity is not a matter of degree, since nothing can be more or less identical to itself. This means that

⁸⁰ For a complete discussion of the problem of graduality, see (Noonan 2003, 103–24). On the way an ontology of temporal parts avoids the problem of graduality, see (Lewis 1976a, 32–36) and (Noonan 2003, 116–21).

⁸¹ Such an example is similar to the ancient problem of “the carriage of Socrates”, discussed also by (Chisholm 1976, 90).

⁸² I shall distinguish two claims here, namely: a) the claim that the graduality of a constitutive condition of identity entails that one *could* think that identity comes in degrees; and b) the claim that the graduality of a constitutive condition of identity entails that one *has* to think that identity comes in degrees. (Thanks to Kristie Miller for pointing that out to me). Although a) would appear reasonable and commonly accepted, b) is too strong and should be better set aside. This is because the fact that identity is grounded in a relation that admits degrees (e.g. psychological continuity) does not seem to entail that personal identity itself has to come in degrees (since one may think that there is some specific amount of psychological continuity that is required for personal identity).

there is a tension between the fact that A at t^1 and B at t^2 may be more or less related given a certain condition of persistence, and the fact that either A is identical to B or it is not.

Accepting an ontology of temporal parts of persons, perdurantists may avoid such a problem arguing as follows: even if identity properly is not a matter of degree, personal identity over time *is a matter of degree* as far as any continuity among temporal parts of persons at different times comes in different degrees. Nonetheless, graduality does not represent any substantial problem within a perdurantist account of personal persistence, being the consequence of the semantic indeterminacy of the concept of person. This means that, as far as personal persistence is concerned, it is the concept of person that fails to provide us with a very specific relation among temporal parts, and hence a sharp-cutting condition of persistence. Cases of graduality about personal identity over time might be hence solved by semantically specifying what kind of relation among temporal parts of person we ought to consider. In chapter 3 I shall advance some perdurantist accounts that, while offering a solution to the problem of graduality, aim to avoid a conventionalist account of personal persistence, and hence do not reduce the persistence question to a semantic matter.

1.6. Persons and the diachronic composition question

Having defined the notion of temporal parts of persons, we should now consider the specific kind of relations connecting temporal parts. If persons are sums of stages located at different times, to account for the persistence of persons we should then focus on the conditions under which some objects (i.e. some temporal parts) compose some further objects (i.e. a person). Composition questions have been widely discussed, and still occupies a central stage in the metaphysical debate. Take the well-known “special composition question” introduced by van Inwagen, and that goes follows:

Special Composition Question (SPQ): Given various things, under what conditions is there something that is composed of those things?⁸³

⁸³ For the original formulation of the special composition question, see (van Inwagen 1987, 22): “Suppose one had certain non-overlapping material objects, the *x*s, at one's disposal; what would one have to do—what could one do—to get the *x*s to compose something?”. See also (van Inwagen 1990b, 33ff) for a detailed explanation and more precise definition of the special composition question. (Markosian 1998a, 212) puts it as follows: “Under what circumstances do some things compose, or add up to, or form, a single object? [...] What necessary and jointly sufficient conditions must any *x*s satisfy in order for it to be the case that there is an object composed of those *x*s?”. Against the special composition question, as a merely verbal and not substantive issue, see (Hirsch 2002, 2005; Balaguer forthcoming). Special composition question should not be confused with the “general composition question”, which concerns the nature of composition – cf. (van Inwagen 1987, 23–26), and then (van Inwagen 1990b, 39): “As the Special Composition Question may be identified with the question, Under what conditions does composition occur? so the General Composition Question may be identified with the question, What *is* composition?”.

Since the literature on the SPQ has become quite extensive, and since my purpose here is just to introduce the reader to the main variants of the composition questions, I shall not attempt a full discussion of strengths and weakness of this question. What I want to point out here is rather that different formulations of this question emerge when parthood is indexed to times. First of all, one may wonder when things *at a given time* may compose a further object; call it the *synchronic composition question*.

Synchronic Composition Question (SynCQ): Given various things existing at a given time, under what conditions is there something that at that time is composed of those things?⁸⁴

Considering parthood synchronically, also the fusion predicate (where a fusion is defined as the minimal upper bound relative to the parthood ordering determined by the three axioms of reflexivity, antisymmetry and transitivity) should be relativized⁸⁵. Let the fusion predicate F be characterized as follows:

Fusion: $F_{\phi z} = \forall x(\phi x \rightarrow Pxz) \ \& \ \forall y(\forall x(\phi x \rightarrow Pxy) \rightarrow Pzy)$

[where the first conjunct says that everything satisfying ϕ must be part of z (so that z is an *upper bound* of the ϕ s in the parthood ordering); and the second conjunct says that z must be part of any other object that has the ϕ s as parts (so that the fusion is *minimal* among all the upper bound of the ϕ s)]. It follows that the fusion of things relative to one time (t-Fusion) is:

t-Fusion: $F_{t\phi z} = \forall x(\phi_t x \rightarrow P_t xz) \ \& \ \forall y(\forall x(\phi_t x \rightarrow P_t xy) \rightarrow P_t zy)$

A different question emerges if we consider cross-temporal fusions (or *diachronic fusions*, or *D-fusions* for short), namely fusions among things located at different times:

ξ -Fusion: $F_{\xi\phi z} = \forall t ((\xi t \ \& \ \exists x \phi_t x) \rightarrow F_{t\phi} z)$

[where ξ is any formula in which t occurs free]. Considering cross-temporal fusion, we also need to put aside the synchronic composition question, in favor of a question about composition over time - let us call it the *diachronic composition question*:

⁸⁴ I borrow this definition, as well as the following ones, from (Cotnoir and Varzi forthcoming, in particular chapter 6.2). Similar definitions can be also found in (Sider 2001a, 133).

⁸⁵ See (Thomson 1983, 216–17; Simons 1987, 183ff; Sider 2001a, 132ff).

Diachronic Composition Question (DCQ): Given various times and various things existing at each, under what conditions is there something that at those times is composed of those things?⁸⁶

(DCQ) may appear a perfect way to formulate the persistence question within an ontology of temporal parts. Still, there is a stronger formulation of the diachronic composition question that we need to consider, i.e. a question considering *minimal diachronic fusions* (or *minimal D-fusions* for short). Given certain things at certain times, a minimal diachronic fusion is a fusion that exists exactly at those times.

Minimal ξ -Fusion: $MF_{\xi\phi}z = F_{\xi\phi}z \ \& \ \forall t (E_t z \leftrightarrow (\xi t \ \& \ \exists x \phi_t x))$

Intuitively, a minimal D-fusion of some objects at various times is the sum of those objects at those times and nothing more. Call the question concerning minimal diachronic fusions the *hard diachronic composition question*.

Hard Diachronic Composition Question (HDCQ): given various times and various things existing at each, under what conditions is there a *minimal D-fusion* of those things at those times?

Such a formulation is a stronger kind of diachronic composition question because it concerns the conditions under which, given a plurality of things, there is something that is composed by these things and nothing more (i.e. something that is a minimal fusion of those things).⁸⁷ To see the difference between (DCQ) and (HDCQ), consider the following scenario.⁸⁸ Let t_1 and t_4 be two times, such that $t_1 < t_4$, and suppose that my body exists at both times, existing in fact from $t_1 < t_{10}$. Now, consider the predicate ϕ : “being a cell of my body”, and let $a_1, b_1, c_1 \dots x_1$ be the cells of my body at t_1 , and $a_4, b_4, c_4 \dots x_4$ the cells of my body at t_4 . As things stand, (DCQ) concerns whether there is anything composed of $(a_1, b_1, c_1 \dots x_1)$ and $(a_4, b_4, c_4 \dots x_4)$. In this case there is something composed of $(a_1, b_1, c_1 \dots x_1)$ and $(a_4, b_4, c_4 \dots x_4)$, namely my body. However, if (HDCQ) is considered, the situation differs, as (HDCQ) concerns whether there is a minimal fusion of $(a_1, b_1, c_1 \dots x_1)$ and $(a_4, b_4, c_4 \dots x_4)$. In other words, it asks whether there is something that is composed only of $(a_1, b_1, c_1 \dots x_1)$ and $(a_4, b_4, c_4 \dots x_4)$. Given that my body existed at other times (and hence there are other things that satisfy the predicate ϕ : “being a cell of my body”), it cannot be this kind of fusion.

⁸⁶ (Torre 2015, 239) offers a slightly different formulation of DCQ, based on Sider’s notion of assignment, namely: “(DCQ): What necessarily and jointly sufficient conditions must a given assignment, f , satisfy for there to be a diachronic fusion of f ?”

⁸⁷ Cf. (Cotnoir and Varzi forthcoming, 245).

⁸⁸ A similar case is presented by (Sider 2001a, 133).

But then, which question should we consider when dealing with personal persistence and temporal parts? Applied to persons, as entities that persist by having different temporal parts at different times, the following two questions emerge:

Diachronic Composition Question of Persons (DCQP): Given various times and various *temporal parts* existing at each, under what conditions is there a *person* that at those times is composed of those temporal parts?

Hard Diachronic Composition Question of Persons (HDCQP): Given various times and various *temporal parts* existing at each, under what conditions is there a *minimal D-fusion* of those things at those times and *this minimal D-fusion is a person*?

Consider the recent characterization of persons within a four-dimensionalist framework given by Johnston, according to which persons are “maximal sums of continuous stages, sums that include all stages continuous with any stage in the sum” (Johnston 2016, 199). Setting aside the continuity of stages (that does not seem necessarily required by four-dimensionalists⁸⁹), let us focus on the notion of maximality. A property ϕ is maximal if and only if it is impossible that both one thing and one of its proper parts exemplify ϕ . Applied to temporal parts and continuant persons, to say that a person P is the *maximal* sum of some given stages (say the ϕ s = x^1 at t^1 , x^2 at t^2 , and x^3 at t^3), is to say that P is composed by *all* the stages in the sum (i.e. x^1 , x^2 , and x^3). This means that the person P cannot be defined by some (but not all) stages in the sum (e.g. x^1 and x^2 ; or x^1 and x^2). The importance of maximality for perdurant persons may be also found in the following definition given by Lewis:

something is a continuant person if and only if it is a maximal R-interrelated aggregate of person-stages. That is: if and only if it is an aggregate of person-stages, each of which is R-related to all the rest (and to itself), and it is a proper part of no other such aggregate. (Lewis 1976a, 22)⁹⁰

However, maximality does not seem enough to characterize persons, for persons are sums that include all *and only* the stages in the sum. In fact, if a person P is the sum of some given stages (say the ϕ s = x^1 at t^1 , x^2 at t^2 , and x^3 at t^3), P is composed by all the stages in the sum (i.e. x^1 , x^2 , and x^3), *and nothing else* (i.e. there is no supplementary stages z^n at t^n that is part of the person)⁹¹. Analyzing composition in terms of mereological fusions, it follows that P is the *minimal upper bound* of the ϕ s: it is an *upper bound*

⁸⁹ Cf. for instance Sider, who accepts entities with (space/temporal/space-temporal) gaps.

⁹⁰ (Gilmore 2017) offers an amendment to such definition so to account for some limit cases.

⁹¹ One may argue that a sum of stages being maximal is an extrinsic feature of the sum itself (namely a feature that does not depend on the sum, for it depends on what stages exist before or after the sum exists, and on the way they are connected to each other), but I prefer not to deal with this issue here, since this goes outside the scope of this section.

because every stage among the φ s is part of P, and it is *minimal* because it is part of every object having all φ s as parts. It follows that (HDCQP) is the question we will consider when dealing with personal persistence and the relative persistence question⁹².

1.7. Perdurantism and mereological essentialism

In this section I want to consider whether a perdurantist account of persistence defined on the bases of the (hard) diachronic composition question above is committed to mereological essentialism about persistence, and if so, whether this may constitute a threat for the view I want to defend.

Mereological essentialism (ME) is the doctrine that an object's parts are essential to it. More specifically, according to (ME) if y is ever part of x , then y is always part of x (provided x exists), or otherwise said that the parts of a certain objects x are necessary for x to exist⁹³.

(ME) Let $y_1, y_2, y_3 \dots y_n$ be parts of x at a certain time t . If x exists at t^* , then y_1 is part of x at t^* & y_2 is part of x at t^* & y_3 is part of x at t^* ... & y_n is part of x at t^* .

Mereological essentialism has been widely defended by three-dimensionalists – e.g. (Chisholm 1973, 1975, 1976), (Plantinga 1975) and (Wiggins 1979)⁹⁴ - given the advantages in solving several paradoxes of coincidence, such as the famous Tibbles case and the lump/statue one⁹⁵. However, mereological essentialism presents a significant disadvantage too, for it clashes with our ordinary understanding of persistence. Consider again the scenario above, and suppose that x is your body and $y_1, y_2, y_3 \dots y_n$ are the cells compositing it at a certain time t . Given (ME), and given the fact that the cells of your body continuously change, it results that x does not exist for a long period of time. In one year around the 95% of the cells constituting a human body is substituted by new ones, and given (ME) it is sufficient to take away one single cell compositing your body at t (y_3 , for instance), to deny that your body still exists. This scenario appears at odds with our ordinary beliefs (and in particular the belief that bodies can survive the loss of certain

⁹² On the importance of questions concerning minimal D-fusion in persistence issues, see (Sider 2001a, 133): "Though it required some machinery to state, the question of which assignments have minimal D-fusions is far from being remote and technical. Indeed, we can restate this question in the following wooly yet satisfying fashion: *under what conditions do objects begin and cease to exist?*".

⁹³ (Chisholm 1973, 581ff) distinguishes two theses that reject respectively any possible temporal and modal change of parts, namely *mereological constancy* (the view that if y is part of x , then it is part of x at every time at which x exists) and *mereological essentialism* (the view that if y is part of x , then it is part of x in every possible world in which x exists). In what follows I will refer to mereological essentialism referring also (and above all) to cases of change of parts over time.

⁹⁴ For further references - also concerning historical precedents - see (Cotnoir and Varzi forthcoming, 232).

⁹⁵ For a complete discussion, see (Sider 2001a, 180–88).

parts⁹⁶), and although it is not a sufficient reason to reject mereological essentialism, it is a cost its advocates have to pay.

Although there may well be other considerations both in favor and against mereological essentialism, this is not the place for a detailed stand on this issue. My aim in this section is rather to consider mereological essentialism within a perdurantist approach – i.e. as a view concerning perdurant entities and their (space)temporal parts.

A first account of mereological essentialism within a perdurantist framework has been discussed by (Heller 1990) and (Jubien 1993), in terms of the view that the atemporal notion of parthood is always necessary, so that if a perdurant thing is part of another, then it is essentially part of it. I agree this is a correct way to characterize mereological essentialism provided that things perdure over time: it claims that if $y_1, y_2, y_3 \dots y_n$ are (perduring) parts of a certain (perduring) object x , x exists only if $y_1, y_2, y_3 \dots y_n$ are parts of x .

(ME-PER) Let $y_1, y_2, y_3 \dots y_n$ be parts of x . If x exists, then y_1 is part of x & y_2 is part of x & y_3 is part of x ... & y_n is part of x .

One may notice that taking an atemporal notion of parthood, the account of mereological essentialism in (ME-PER) gets rid of any temporal understanding of parts change in favor of a modal one. (ME-PER) does not entail any temporal constancy of the parts of x : assuming an atemporal notion of parthood it is consistent in fact also with cases in which x exists at t and y is part of x , although y does not exist at t (since the whole exists – even if not entirely located – at any time in which its temporal parts exist, and it has those temporal parts atemporally). It says rather that x cannot exist if any of its parts (the perduring objects $y_1, y_2, y_3 \dots y_n$) are not part of it. This is the case in which $y_1, y_2, y_3 \dots y_n$ are as extended as x . But (ME-PER) also accounts for cases in which $y_1, y_2, y_3 \dots y_n$ are parts of x , and have a shorter temporal extension than x . Given the atemporal notion of parthood, (ME-PER) avoids referring to time also in this case, claiming that x has *simpliciter* the parts it has for a specific period of time⁹⁷.

Besides that, there is a further way mereological essentialism comes on the perdurantist scene, which concerns the relation between temporal parts and the

⁹⁶ Chisholm's account of *entia successiva* (Chisholm 1976, chap. 3) is a possible way to reconcile mereological essentialism and ordinary beliefs. (Della Rocca 1996) offers an interesting argument in defense of mereological essentialism based on the interpretation of our intuition of persistence. Roughly, Della Rocca's idea is that in saying that John survives the loss of certain cells, our intuition is not that *John* survives the loss of certain cells, but that there is *a* person with a certain property P that survives the loss of certain cells. For discussion see (Sider 2001a, 182–83).

⁹⁷ It is interesting to notice that in this case whether (ME-PER) obtains rests upon some further issues, concerning the metaphysics of time. In fact, in this case (ME-PER) seems to hold only given eternalism (the view that past, present and future entities exist), whereas it does not seem viable given presentism, growing block or shrinking tree. However, I am not dealing with this issue, since this is beyond the scope of my research.

perdurant entities they compose (call it *ME-TP* just to distinguish it from the definitions above). It goes as follows:

(ME-TP) Let $y_1, y_2, y_3, \dots, y_n$ be *temporal parts* of x . If x exists, then y_1 is a *temporal part* of x & y_2 is a *temporal part* of x & y_3 is a *temporal part* of x ... & y_n is a *temporal part* of x .

(ME-TP) says that if we remove one temporal part from the whole perdurant, then necessarily the whole perdurant does not exist anymore. I think that (ME-TP) is a reasonable thesis, being no threat for an account of personal persistence within a perdurantist framework.

(ME-TP) may be understood as a specific case of the maximal proposition applied to integral wholes, which has been widely discussed by medieval philosopher⁹⁸. The maximal proposition applied to integral wholes, says that “If the whole is, then a part is”, entailing that “if a part is not, the whole is not”. Applied to persons as perdurant entities, (ME-TP) is then the view that any temporal part is essential to the existence of the whole perdurant person: “If the *whole perdurant person* is, then a *temporal part* is”, and then “if a *temporal part* is not, the *whole perdurant person* is not”.

There are, I think, two ways to explain the maximal proposition applied to perdurant persons, which are both unproblematic. I) If the ‘whole perdurant person’ refers to the ‘complete perdurant person’ (i.e. the entity composed of a plurality of temporal parts), then by saying that the whole is destroyed by removing one part is just to say that the whole perdurant person is incomplete if we remove one temporal part. II) If the ‘whole perdurant person’ refers to ‘all the temporal parts of the perdurant person taken together’ (i.e. the plurality of the entities), then the maximal proposition above just says that if we remove even just one temporal part, then the perdurant person composed by this temporal part (and others) does not exist anymore. As things stand, I think that mereological essentialism applied to perdurant persons in terms of (ME-TP) does not constitute any threat for perdurantism.

To be sure, I am not saying that (ME-TP) is a necessary commitment for a perdurantist account of personal persistence. One may reject (ME-TP) by arguing, for instance, that only some temporal parts are required to keep the whole perdurant person, whereas other temporal parts can be lost without compromising the integrity of the whole. It follows a distinction between “primary temporal parts” and “secondary temporal parts”⁹⁹, which is however not trivial at all. How can we determine which are the primary, or principal, temporal parts? How are primary temporal parts defined? (If they are defined in terms of “the parts that, when removed, compromise the form of x ”, then a

⁹⁸ See (Arling 2015).

⁹⁹ Such a distinction between primary and secondary temporal parts might be understood in relation to the distinction between “principal” and “secondary” parts of things discussed by medieval philosophers – e.g. Albertus Magnus in his *Commentarii in librum Boethii de Divisione* and Buridan in the *Summulae de Dialectica*. For a complete discussion, see (Arling 2015, sec. 4.2).

distinction between the whole *secundum formam* and the material whole is presupposed. But perdurantism does not seem committed to such distinction). As things stand, mereological essentialism of temporal parts applied to perdurant persons may appear reasonable and maybe even preferable. (I will go back to this point in section 2.5.1.)

1.8. Lewis and the standard perdurantist account of personal persistence

1.8.1. Unrestricted composition principle and temporal parts

According to a shared view,¹⁰⁰ perdurantism (and more generally four-dimensionalism), is plausibly accompanied by another metaphysical principle, namely the *principle of unrestricted mereological composition* – also called *principle of unrestricted mereological fusion*, or *mereological universalism*. In a nutshell, this principle says that, for any collection of objects, there is something that is the mereological sum (or fusion) of those objects, i.e. a further object that contains those objects as parts. In other words, it says that any group of objects has a sum, regardless of how far or different those objects may be¹⁰¹. Thus, according to this principle, there are many more things than the ones we recognize in ordinary life: there are things like the fusion of the Empire State Building and my volume of the *Enquiry Concerning Human Understanding*; or the fusion of the Tour Eiffel, my laptop, and your right hand; or the object called “Obamump” composed by Barack Obama’s head, and Donald Trump’s torso (can you picture it?).

Unrestricted composition can be axiomatized as follows¹⁰²:

Unrestricted Composition: $\exists x\varphi x \rightarrow \exists zF_{\varphi}z$

(i.e. for any formula or predicate φ , provided that there is something satisfying φ , there is a fusion of all the things satisfying it).

Dealing with composition in time, both synchronically and diachronically, different kinds of unrestricted composition emerge, namely *unrestricted synchronic composition*, *unrestricted diachronic composition*, and *unrestricted minimal diachronic composition*.

Unrestricted Synchronic Composition: $\forall t (\exists x\varphi_t x \rightarrow \exists z (E_t z \& F_t \varphi z))$

Unrestricted Diachronic Composition: $\exists t (\xi t \& \exists x\varphi_t x) \rightarrow \exists z F_{\xi\varphi} z$

¹⁰⁰ See (Lewis 1986a; Sider 2001a, 7), but also endurantists like (Johnston 2016).

¹⁰¹ For a complete discussion on unrestricted composition, see (Varzi 2016, sec. 4.4) and (Cotnoir and Varzi forthcoming, chap. 2 and 5).

¹⁰² In formalizing unrestricted composition, I follow the lead of (Cotnoir and Varzi forthcoming, 30 and 243–45).

Unrestricted Minimal Diachronic Composition: $\exists t (\xi t \ \& \ \exists x \varphi_t x) \rightarrow \exists z M F_{\xi \varphi} z$

Thereafter, I will refer to *unrestricted minimal diachronic composition* (which is the strongest kind of unrestricted composition) when I will talk about diachronic universalism. *Diachronic universalism* is then the thesis that for any assignment of objects there is a minimal D-fusion of those objects¹⁰³.

As I said, most four-dimensionalists accept unrestricted composition (although this is not necessary)¹⁰⁴, and among them stands out Lewis.¹⁰⁵ It is easy to find countless passages in which Lewis defends unrestricted composition¹⁰⁶. Here is a representative sample:

“I claim that mereological composition is unrestricted: any old class of things has a mereological sum. Whenever there are some things, no matter how disparate and unrelated, there is *something composed of just those things*. [...] Speaking restrictedly, of course we can have our intuitively motivated restrictions on composition. But not because composition ever fails to take place; rather, because we sometimes ignore some of all the things there really are.” (Lewis 1986, 211–13, italics added).

“I say that whenever there are some things, they have a fusion. *Whenever!* It doesn't matter how many or disparate or scattered or unrelated they are. It doesn't matter whether they are all and only the satisfiers of some description. It doesn't matter whether there is any set, or even any class, of them. (Here's where plural quantification pays its way, for better or worse.) There is still a fusion. So I am committed to all manner of unheard-of things: trout-turkeys, fusions of individuals and classes, all the world's styrofoam, and many, many more.” (Lewis 1991, 72–87).

The principle of unrestricted composition may be applied to temporal parts as well: I call *liberal perdurantism* (or *universalist perdurantism*) the perdurantist account of

¹⁰³ For a standard formulation of diachronic universalism, see (Sider 2001a, 153ff). An alternative formulation has been advanced by (Magidor 2016, 528).

¹⁰⁴ I notice that not even the reverse is necessary, namely that unrestricted composition entails four-dimensionalism. (Sider 2001a, chap. 4) offers a modified version of the main argument in favor of unrestricted composition as an argument for four-dimensionalism.

¹⁰⁵ Proponents of a strict relation between perdurantism and universalism are also (Quine 1981, chap. 1), (Armstrong 1989), (Heller 1990, sec. 2.9), (Jubien 1993, 14–17), (Hudson 2000, 2001), (Sider 2001a, 120–39), (Braddon-Mitchell and Miller 2006b), and (K. Miller 2006a), who claims that four-dimensionalism is not compatible with a sparse ontology. (K. Miller 2008b) analyzes the advantages of universalism also in relation to endurantism. (Balashov 2003a, 2003b; Effingham 2011b) reject such a pairing, arguing in favor of a non-universalist perdurantism. Against both universalism and temporal parts, see (van Inwagen 1990b, sec. 8), (Markosian 1998a), and (Merricks 2001).

¹⁰⁶ As Lewis pointed out in a footnote, his account is not committed to accept an absolute unrestricted composition, according to which also members of different categories compose further objects – eg. “sets with individuals, or particulars with universals, or cats with numbers” (Lewis 1986a, 212). Since I will deal only with temporal parts of persons, and hence individuals, such a limitation appears irrelevant.

persistence committed to unrestricted mereological composition¹⁰⁷. According to liberal perdurantism, for any collection of temporal parts, there is an object that is the fusion of nothing but those temporal parts. Accepting both an ontology of temporal parts and the principle of unrestricted composition, the ontological commitments increase: the inventory of the world would register an extraordinary plurality of entities. Besides the things that we ordinarily recognize, there are also things like the fusion of the stage of the Empire State Building on May, 1 1931, and your laptop today; or the fusion of my stages until 10 years old and Johnny Deep's stages during the shot of Pirates of the Caribbean, and so on and so forth. What a packed and messy world, one may think!

There are several arguments that have been used in defense of universalism in general, and which apply to universalist perdurantism as well, but among them the most important one is the so called *argument of vagueness*.¹⁰⁸ Advanced by (Lewis 1986a),¹⁰⁹ the argument of vagueness points out a significant problem for any restricted account of composition - according to which composition only obtains under certain circumstances, so that not any collection of objects has a fusion. This is the way Lewis put it:

“The trouble with restricted composition is as follows. It is a vague matter whether a given class satisfies our intuitive *desiderata* for composition. Each *desideratum* taken by itself is vague, and we get still more vagueness by trading them off against each other. To restrict composition in accordance with our intuitions would require a vague restriction. It's not on to say that somewhere we get just enough contrast with the surroundings, just enough cohesion, . . . to cross a threshold and permit composition to take place, though if the candidate class had been just a little worse it would have remained sumless. But if composition obeys a vague restriction, then it must sometimes be a vague matter whether composition takes place or not. And that is impossible.” (Lewis 1986a, 212)

In a nutshell, the argument of vagueness is supposed to show that if composition is restricted, then it is sometimes vague whether composition occurs. This is given by the

¹⁰⁷ Here I use universalism and liberalism interchangeably. For a different account see (Magidor 2016, 526–27), according to which universalism of composition is a necessary but not sufficient condition for liberal perdurantism.

¹⁰⁸ Arguing against universalism about diachronic composition, (Effingham 2011b) focuses on what he calls the three “arguments from elegance” used by universalist perdurantists, namely: the “argument from simplicity” (according to which universalism is the simpler answer to the special composition question); the “argument from cultural prejudice” (which claims that any restricted composition would lead to claim that some cultures rather than others are wrong, given that there are different beliefs about what objects exist depending on different cultures, whereas universalism stays neutral on that); and the “argument from a healthy ontology” (according to which an unrestricted principle of diachronic composition allows us to accept the objects of our folk belief, avoiding the costs of a sparse ontology). Given the detailed analysis presented by Effingham, I'm not going into such issues here, interesting though they are.

¹⁰⁹ For a discussion and development of the argument of vagueness, see (Sider 1997, 2001a, sec. 4.9). (Koslicki 2003) criticizes Sider, and (Sider 2003) replies. (Merricks 2005) argues that Lewis' vagueness argument fails; criticisms against this argument have been moved also by (Effingham 2009b, 2011a). (Magidor 2016: 513-4) deals with Sider's argument and the “problem of count-indeterminacy”.

fact that for any principle of restricted composition there are cases in which it is vague whether composition occurs - since any plausible restriction of composition would be a vague one. But since vagueness of composition is not possible, for either composition occurs, or it does not occur, restricted composition should be better rejected in favor of unrestricted composition (or in favor of the opposite extreme position – i.e. nihilism about composition)¹¹⁰. Otherwise said, Lewis’s argument is that the denial of unrestricted composition - and hence of the idea that every collection of objects has a fusion - entails that there are two possible cases, connected by a continuous series of cases each extremely similar to the last, such that composition occurs only in one of them. If we accept that composition cannot be vague, then there must be a sharp cut-off in this series, such that composition immediately stop occurring. But since there is no such a cut-off, it follows that composition always occurs, and hence composition is unrestricted. Vagueness results hence semantic rather than ontological.

“The only intelligible account of vagueness locates it in our thought and language. The reason it's vague where the outback begins is not that there's this thing, the outback, with imprecise borders; rather there are many things, with different borders, and nobody has been fool enough to try to enforce a choice of one of them as the official referent of the word 'outback'. Vagueness is semantic indecision.” (Lewis 1986a, 212)

This leads to a second argument in defense of a universalist approach to perdurantism, which concerns the persistence of material objects. Applied to temporal parts and diachronic composition, universalism provides us with an account of cases in which it is vague whether objects persist or not. Take for instance a statue. Given a restricted principle of diachronic composition for statues, there is just one four-dimensional object composed by certain temporal parts. However, if we set aside extreme cases of creation *ex nihilo* and abrupt destruction, a statue does not seem to have a clear moment in which comes into existence, nor a clear moment in which it goes out of existence. There are moments in which it clearly persists (when it stands for instance in museum - like the Aphrodite of Milos, or in the middle of an island - as the Liberty Statue, or on the top of a hill - as the Cristo Redentor in Rio de Janeiro) and moments in which it clearly does not persist anymore (after being destroyed in very tiny pieces and reduced to dust, as it sadly happened, for instance, to the Buddhas of Bamiyan, the 4th century monumental statues in the Bamiyan valley in Afghanistan, which have been dynamited and destroyed in March 2001). However, there are also cases in which it is more difficult to say whether the statue persists, for instance before the very last and minimal adjustment by its creator, or after the first hammer blow before its complete destruction. Accepting unrestricted diachronic

¹¹⁰ That Lewis’s argument of vagueness is just an argument against “middling” or moderate views about composition, whereas it does not threaten the nihilist approach, has been pointed out also by (Markosian 1998a, 231) and (Sider 2001a, sec. 4.9, 2013, 43–44). A nihilist approach to composition, according to which there are no composite objects (no tables, no cats, no persons, etc.), has been defended among others by (Unger 1979a, 1979b, 1980b; Horgan 1993; Dorr and Rosen 2002; Cameron 2010; Sider 2013).

composition, universalist perdurantism may argue that there are a lot of different four-dimensional objects nested into each other and composed by different collections of temporal parts. The indeterminacy in persistence is then explained by our difficulties in dealing with so many four-dimensional objects around us. It is consequence of the fact that it is semantically vague which four-dimensional object we point out when we refer to “statue”. And the same discourse applies to persons as well, for which cases of vagueness of persistence (from the development of the fetus to status of coma or to the last breath) are so common that exotic thought experiments do not seem necessary to appreciate such a vagueness. Given that an object surviving or not some changes is the result of a linguistic convention, cases of vagueness are then solved by endorsing a linguistic or semantical approach to it: the persistence of an object depends on our standards, on the classification we choose to use for that object.¹¹¹ And the same applies for persons: given a universalist account of composition, a person surviving or not some changes results conventional, depending on the classification we decide to use for persons. Since all collections of stages compose an object, there are no privileged four-dimensional entities that carve at the joints and that are persons. Persons just consist of stages related pairwise by a certain relation, namely the relation of personal unity.

Before going ahead, let me clarify a connection I will consider in the following sections, namely the connection between (Lewisian) universalist perdurantism and conventionalism about personhood.¹¹² Firstly, I agree that universalism does not entail strong conventionalism – where strong conventionalism is the view that for some entities, they exist only in virtue of a given convention. Universalism about diachronic composition commits us to a wide plurality of perdurant entities, united by various kinds of relations, but none of them exist in virtue of there being a convention. In fact, since according to universalism any plurality of parts composes something, every whole exists just in virtue of its parts. *What sort* of thing is composed – a table, a cat, a person etc. - depends on the connections between the parts, and which thing our linguistic expressions pick out when used in a given context will depend on our semantic conventions. But the existence of no entity depends on any convention.

Secondly, conventionalism comes in a weak form, according to which there are no convention-independent facts of the matter with respect to what parts compose a whole of kind K. I call weak conventionalism about personal identity the view that of some set of eligible candidates, the ones that are persons are determinates by certain conventions. I also agree that universalism about diachronic composition does not entail weak conventionalism either. Indeed, universalism is *compatible* with the claim that only some

¹¹¹ A further reason for perdurantists to accept universalism is that it avoids the distinction between integral wholes (i.e. entities composed of a given collections of objects) and sums (i.e. mere collections of objects that does not compose a further entity). In fact, if composition does not always occur, it is necessary to distinguish collections of temporal parts which have a sum, and collections of temporal parts which do not. Also, such a distinction leads to borderline cases, in which it is unclear whether a certain sum of parts compose an object or not, leading back to the argument from vagueness discussed above.

¹¹² I'm grateful to Kristie Miller and Thomas Sattig for pushing me in this direction.

stages – namely the ones (maximally) related by a certain relation R – constitute perdurant persons, and it is a non-conventional fact which R -relation matters for diachronic composition. Thus, even if there are other stages unified by some relations R^* , R^{**} , R^{***} , etc. which are similar to R , the entities composed by those stages are not persons, and it not a conventional matter that they are not persons.

Thirdly, it is important to notice that neither strong nor weak conventionalism about personhood are to be conflated with the kind of *semantic* conventionalism recognized by Lewis in cases of vagueness, where semantics and linguistic precisifications play a fundamental role. Universalists about composition can say that it is a matter of non-conventional facts that some of the things are persons, and others are not. Though, they might say that there are a bunch of largely overlapping things, and yet it is merely a matter of semantic convention which of those we pick out by using an expression. In other words, the fact that it might be vague which fourdimensional object is me, does not entail that there are no substantive facts about the persistence conditions persons have, and hence that conventionalism about personal identity over time is correct.

However, even if I agree that universalist perdurantism does not entail strong or weak conventionalism about personal identity over time, I think that universalist perdurantism in some sense “naturally goes along with” weak conventionalism – as it is suggested also by the fact (which is, of course, merely sociological) that most perdurantists accept some version of weak conventionalism.

Finally, let me now spend some words on the reasons why one may think that conventionalism about personal persistence is problematic, and hence might be a cost when evaluating the views on the market. Consider a plurality of relation: R , R^* , R^{**} , R^{***} , etc. According to a conventionalist account of personal persistence, even in its weak version, it is a conventional matter which relation is the relation of personal persistence, and hence which plurality of temporal parts compose what we are. According to some philosophers, it is an advantage rather than a cost of a theory of personal persistence to acknowledge an element of conventionality in our account of personal persistence – cf. for instance (Braddon-Mitchell and West 2001). However, anyone who endorses the idea that the concept of *personhood* is not conventional in its nature would count as a cost to admit conventional elements in the constitutive conditions of personal persistence.

1.8.2. Connecting the stages: temporal parts vs temporal counterparts

Dealing with a stage theoretic account of persistence, in section 1.3.3. I introduced the notion of temporal counterparthood, which is a counterparthood relation among entities at different times. In this section I am going to analyze the way the notion of temporal counterparthood has been used by Lewis to account for the relation among temporal parts of persons. I argue that the notion of temporal counterparthood, as used by Lewis

himself (Lewis 1971, 1976a), leads to a misleading interpretation of his perdurantist account, and more generally of the standard perdurantist approach to personal persistence.

Before dealing with the relation of temporal counterparthood, let me spend some words on two other relations among stages that are central in Lewis's account of personal persistence: the *R-relation* and the *I-relation*. Introducing the perdurantist account of persistence in section 1.3.2., we saw that personal identity over time is a matter of unity among temporal parts, whose being related turns out to constitute a determinate person perduring across time. According to (Lewis 1976a), such a unity rests upon a specific R-relation, that consists in a relation among stages in virtue of a determinate kind of continuity or connectedness,¹¹³ and whose obtaining is essential for constituting persistence over time, both for ordinary objects and for persons. So, he claims that

“if you wonder whether you will survive the coming battle or what-not, you are wondering whether any of the stages that will exist afterward is R-related to you-now, the stage that is doing the wondering. Similarly for other "questions of personal identity." If you wonder whether this is your long-lost son, you mostly wonder whether the stage before you now is R-related to certain past stages. If you also wonder whether he is a reincarnation of Nero, you wonder whether this stage is R-related to other stages farther in the past” (Lewis 1976a, 20–21).

An R-relation is then nothing but a determinate kind of relation, that constitutes personal identity over time by relating some stages in virtue of a sort of continuity or connectedness. Otherwise said, Lewis's R-relation is what I called the *constitutive condition of diachronic composition* (i.e. the Φ completion of (1P) in section 1.3.2.). Still according to Lewis an R-relation cannot provide any complete explanation of diachronic identity without introducing another kind of relation, which properly concerns the unity of R-related stages. This is the *I-relation* among stages. In fact, although an R-relation is what connects two temporal parts in virtue of a determinate condition R, it says nothing about the existence of a singular continuant, constituted by those stages. Such a commitment requires the introduction of a further relation that concerns the unity of different stages constituting a single persisting thing, such as a single persisting person.

“Of course the R-relation among stages is not the same as identity either among stages or among continuants. But identity among continuant persons induces a relation among stages: the relation that holds between the several stages of a single continuant person. Call this the *I-relation*. It is the I-relation, not identity itself, that we must compare with the R-relation” (Lewis 1976a, 21)

¹¹³ For a distinction between continuity and connectedness among stages, that I am not considering here, see Lewis (1976: 18).

As Lewis points out, the I-relation is then a unity relation among stages, which cannot be confused with the relation of identity.¹¹⁴ Whereas the relation of identity concerns the fact that one, two or more things exist at different times, the I-relation concerns the fact that two or more things compose a further unified entity. So, given x at t and y at t^* , a question on identity wonders whether x at t and y at t^* properly are the same thing at different times, whereas the I-relation question wonders whether x at t and y at t^* are parts of a unique continuant. Given the formulation of the persistence question in section 1.3.2., the distinction between the unity and the identity relation may be no threat for a perdurantist account of personal persistence: the I-relation is what matters in survival, for it grounds the persistence of persons by unifying R-related stages. This is what Lewis has in mind when he claims as follows:

“in wondering whether you will survive [...] you wonder whether any of the stages that will exist afterward is I-related to – belongs to the same person as – your present stage. If questions of survival, or personal identity generally, are questions of identity among continuant persons, then they are also questions of I-relatedness among person-stages; and conversely. More precisely: *if common sense is right that what matters in survival is identity among continuant persons, then you have what matters in survival if and only if your present stage is I-related to future stages*” (Lewis 1976a, 21–22).

However, it would be misleading to think that no identity is involved in the Lewisian perdurantist account, for the whole perdurant person persists numerically identical to itself through time. In fact, a perdurant person P exists at a time t^1 even though it is not exactly - or wholly - located at t^1 , but only one temporal part of it is exactly located at t^1 . Still, the perdurant person P at t^1 is numerically identical to the perdurant person P at t^2 , if ‘ P at t^1 ’ and ‘ P at t^2 ’ refer to the perdurant person, and not to its temporal parts existing at t^1 and t^2 respectively.

Continuant persons are maximal aggregates of “person-stages, each one I-related to all the rest (and to itself). For short: a person is an interrelated aggregate” (Lewis 1976a, 22). To be sure, there may well be other considerations about the R- and I-relations advanced by Lewis. However, since my aim in this section is to analyze the notion of counterparthood, this will suffice for the moment as a specification of Lewis’s perdurantist approach.

Discussing the possible R-relations among stages, Lewis introduces the notion of *temporal counterparthood*. Temporal counterparthood is a particular kind of counterparthood relation, holding among entities at different times - rather than among entities at different worlds. Temporal counterparthood is a relation of diachronic similarity, and as such, it is no equivalence relation for it fails to be transitive¹¹⁵. Thus, temporal counterparthood significantly differs from the unity relation among stages (the

¹¹⁴ On the difference between unity- and identity- relations, see (Perry 1972, 1975, 7–12).

¹¹⁵ Cf. (Lewis 1971, 209).

I-relation), which is an equivalence relation. The importance of temporal counterparthood in Lewis's perdurantist account of personal persistence consists in the fact that any R-relation among stages at different times is supposed to rest upon a specific relation of temporal counterparthood among those stages (that is to a specific relation of similarity among them).

But if the relation of temporal counterparthood is what grounds any R-relation, one may wonder whether temporal counterparts rather than temporal parts are involved into the persistence of persons. And if so, if persons are in fact constituted by stages that are in counterpart relation, what distinguishes perdurantism from the stage view, according to which things do not persist strictly speaking?

I think that such an unclear situation is the consequence of a tension between two claims in Lewis's perdurantist account of personal persistence, namely i) the claim that persons (and objects in general) are four-dimensional entities that are literally composed of other entities at various times (i.e. stages), and ii) the claim that stages are in a relation of counterparthood. More specifically, the tension arises from the fact that Lewis rejects five-dimensionalism (i.e. the thesis that objects have modal parts as well), and then the claim that persons are modal continuants,¹¹⁶ while accepting that persons are four-dimensional entities. If (modal) counterparts do not constitute a trans-world individual, why should we accept that temporal counterparts constitute an individual extended over time? In other words, if stages are connected by a relation of (temporal) counterparthood, why should we accept perdurantism rather than a stage view? As I have argued above in section 1.3.3., the theory of counterparthood has been used in fact by stage theorists, who are not committed to the existence of the four-dimensional entities, the only things that exist being the stages in a relation of temporal counterparthood.

A first possible way to solve such a tension in Lewis's account is to distinguish neatly temporal counterparthood from modal counterparthood. If on the one hand modal counterparts do not constitute any five-dimensional entity, being nothing but different entities at different worlds, on the other hand temporal counterparts do constitute four-dimensional entities, having a sort of identity, as parts of the same perdurant object¹¹⁷. As things stand, the so called relation of temporal counterparthood results much more similar to an R-relation among temporal parts than it is to modal counterparthood, although the label used by Lewis may suggest the contrary. Temporal counterparthood would be hence a (misleading) way to refer to the plurality of R-relations, which emerge

¹¹⁶ "I shall argue that indeed there are things that enjoy trans-world identity in this sense. But then I shall argue that we ourselves, and other things that we ordinarily name, or classify under predicates, or quantify over, are not among them. [...] trans-world individuals are impossible individuals." (Lewis 1986a, 211–12). For discussion, see (Torrengo 2011), who explores the possibility of construing the modality as a dimension along with space and time.

¹¹⁷ On this issues, see (Varzi 2001) and (Cotnoir and Varzi forthcoming, 236).

from the similarities among stages at different times - similarities that in turn are always relative to certain features¹¹⁸.

A second possible solution to this tension is to say that a temporal counterparthood is in fact a kind of counterparthood, and as such it has no ontological import in the unification of stages into perdurant entities. Temporal counterparthood would be an epistemic relation of similarity among temporal parts, that has no ontological role in the stages' being I-related and hence unified into continuant objects. At first sight, such an epistemic understanding of temporal counterparthood may appear the defeat of perdurantism in favor of a stage theory of persons. If temporal counterparthood plays no ontological role, why should we say that any stages are I-related and hence unified into perdurant entities? I think that this worry is misplaced, at least as far as unrestricted composition of temporal parts is accepted. Given this principle, in fact, any collection of temporal parts has a sum, regardless of the similarities among such temporal parts. It follows that given a universalist approach to diachronic composition, as the one defended by Lewis, an epistemic understanding of temporal counterparthood may turn out to be even more viable, since two stages being I-related does not require any relation of similarity in order to obtain.

Both solutions to this tension seem reasonable, and although I will not take a definitive stand on which one should be preferred, I think the first one is more in line with Lewis's account of temporal counterparthood. According to this latter, in fact, temporal counterparthood is an ontological relation, which is not reducible, in a Humean way, to an epistemic relation of similarity operated by our intellect and restricted into our minds. Although Humean, Lewis should not be confused with Hume in this respect. Anyway, regardless of which reading of temporal counterparthood should be preferred, what is important to notice is that within Lewis's perdurantist account, temporal *counterparts* of persons are nothing but temporal *parts* of persons. Temporal counterparthood gives then no reasons to abandon perdurantism in favor of a stage theory of personal persistence.

1.8.3. Two problems for Lewis's perdurantist account of personal persistence

Accepting an ontology of temporal parts, Lewis's account of personal persistence presents several advantages, being able to solve both the puzzle of graduality and the

¹¹⁸ Cf. (Lewis 1971, 206–8): “the counterpart relation depends on the relative importances we attach to various different respects of similarity and dissimilarity [...] counterpart relations are a matter of over-all resemblance in a variety of respects. If we vary the relative importances of different respects of similarity and dissimilarity, we will get different counterpart relations. Two respects of similarity or dissimilarity among enduring things are, first, personhood and personal traits, and, second, bodyhood and bodily traits. If we assign great weight to the former, we get the personal counterpart relation. Only a person, or something very like a person, can resemble a person in respect of personhood and personal traits enough to be his personal counterpart. But if we assign great weight to the latter, we get the bodily counterpart relation”.

puzzle of fission (see section 1.5.2.). Nonetheless, such a standard perdurantist view has not caught on in the metaphysical debate on personal identity. There are two main reasons that have contributed to make it an unpopular and minority position.

The first reason is that a Lewisian perdurantist account, which is committed to diachronic universalism and mereological essentialism, leads to an extraordinarily overpopulated world. Suppose you hold a book in your hand right now. According to Lewis's account you are not holding just one (four-dimensional) book, but a multitude of entities that are composed by several temporal parts, and among others the temporal part of book now. Accepting diachronic universalism, in fact, for any collection of temporal parts at different times there is an object that is the sum of those temporal parts (cf. section 1.8.2. above), so that the world proves to be populated by many more entities than the ones we recognize in ordinary life. Such a multitude of perdurant entities is also increased by the principle of mereological essentialism, according to which any single temporal part is essential for any perdurant entities. It follows that A and B are two distinct entities even if all parts of B are parts of A (i.e. B is proper part of A) and there is only one temporal part of A that is not part of B.

The scenario appears even less likely as soon as we consider the case of people, for Lewis's perdurantist account also entails the existence of many more persisting persons in our ontology¹¹⁹. Suppose that yesterday you met your friend Achille in front of the Butler Library; in Lewis's account, what happen is that you met a vast multitude of temporal extended entities, a vast multitude of friends which coincide and are co-located as long as they share temporal parts. More in general, a standard perdurantist account seems to lead to the unpleasant consequence that wherever there is one person in front of us, there are many millions of people in front of us. But if so, which of those things should Achille be? It follows that, along with the commitment to very permissive ontology, a Lewisian perdurantist account leads to extraordinary increase of cases of coincidence (on coincidence issues, see sections 1.3.1-1.3.2. above) and to the so-called "problem of the many", which is familiar enough to be invoked here without extensive commentary¹²⁰.

For sure, Lewisians about persistence may reply that this is a misleading description of the scenario. First, it is misleading for it does not consider the fact that perdurant persons are supposed to be *maximal* aggregates of temporal parts that are related by a certain continuity or connectedness (for maximality cf. section 1.6.). I think this is a reasonable answer a perdurantist may advance, but not completely satisfying. In fact, even renouncing to the fact that you met a plurality of persons, we still ought to say that you met a plurality of entities (that have among their parts at least one stage of the person

¹¹⁹ (Markosian 1998a, 241–42) expressed a similar worry, that he labelled the "plurality problem" of universalism.

¹²⁰ The problem of the many has been introduced by (Unger 1980a), and then discussed among others by (Lewis 1993), (Sanford 1993), (McKinnon 2002) – for an introduction, see (Weatherson 2016b). (Sattig 2013) develops an interesting solution to the problem based on a quasi-hylomorphic account of ordinary objects.

you met) and among them a plurality of uncomplete persons – what (Johnston 2016, 2017) called “personites”¹²¹ – that may be a plurality of friends – provided that “being a friend” does not require being a maximal aggregate. Still, an advocate of Lewisian perdurantism may reply that in the case above what really happens is that you met *a temporal part of person* (call it Achille-yesterday), which is located in the past and precisely yesterday, rather than the entire perdurant person. Although commonly accepted, I doubt such a reply may be satisfying, and the reason rests upon counting within a perdurantist approach. Unless we give up perdurantism in favor of a stage view, material objects (and then persons) are extended over time and composed of temporal parts. So, if we wonder how many friends you met yesterday in front of the Butler Library, *we are counting perduring entities, and not temporal parts*. And if this is right, the question remains unanswered. However, a Lewisian perdurantist may reply that the difficulties in counting perdurant persons rests upon the semantic vagueness of the notion of “person” (see above section 1.8.1.). This reply leads to the second disputable consequence for a Lewis’s perdurantist account, which concerns the conventionality of personal persistence.

As I pointed out above (section 1.8.1.), a Lewisian standard perdurantism, which is committed to diachronic universalism, accounts for the conventionality of persistence of material objects, so that the persistence of a certain object of a kind K rests upon our classification of K. Recognizing a multitude of four-dimensional objects, universalists argue in fact that it is up to us which object counts as a ship, which counts as table, and eventually which counts as a person¹²². Vagueness of persistence turns out to be nothing but a linguistic issue that can be solved by a specification of the concept K. And the same discourse applies to persons, whose persisting through time is a conventional matter, based on the way we define the notion of “person”¹²³. But if the unity of temporal parts into a perdurant person is just based on conventional issues (which may consist in turn on some sort of similarities among temporal parts), then such a unity, and then the

¹²¹ See footnote 75 above.

¹²² Although I think that (diachronic) universalism is a sufficient condition for conventionalism about persistence of objects within an ontology of temporal parts, I am not arguing that it is necessary one. In fact, a conventionalist account may also emerge in cases in which unrestricted composition does not obtain. Take for instance the puzzle of Theseus’s ship, and suppose that diachronic composition occurs both when there is continuity of sortal and when there is continuity of material constituents. Regardless of the different kind of principle of composition, also in this case a conventionalist approach would recognize different kinds of temporal extended objects corresponding to different concepts of ship, and which object counts as a ship is a conventional matter. And the same option would appear conceivable in cases of personal identity: one can be conventionalist and restrictivist about diachronic composition by arguing, for instance, that it is not metaphysical facts, but instead conventions that determines which (restricted) things exist, and are persons (Thank you to Kristie Miller for making this point clearer to me).

¹²³ Along with Lewis, conventionalism about persistence within an ontology of temporal parts has been also defended among others by (Heller 1990, 23), (Sider 2001a, 2001b, 2011), (Braddon-Mitchell and Miller 2004), and (K. Miller 2010, 2013). For a discussion on conventionalism – in particular in the way defended by Sider – see (Gilmore 2015). (K. Miller 2015) analyze the relation between conventionalist accounts of personal identity and diachronic prudential concerns, defending what she calls a “prudential relativism”.

persistence of individuals, results at best fragile. What kind of changes we can undergo and still survive is a conventional issue. As it is conventional whether some fetus-temporal parts (or some corpse-temporal parts) are parts of a perdurant person or not.

Moreover, if the persistence of persons is arbitrary and conventional, it follows that there is no privileged perdurant that is a person from a strong metaphysical perspective: there is neither a privileged perdurant entity being me, nor a privileged perdurant entity being you. As a consequence, within a Lewisian perdurantist approach the whole problem of personal identity over time results metaphysically empty, and the debate concerning the conditions of personal persistence nothing but an unsubstantive matter. In other words, Lewis's perdurantism applied to personal persistence leads to a deflationist approach to personal persistence, for it reduces the ontological question of persistence to a question of practice, namely "what kind of relation among temporal parts we want to refer to when we talk about 'persons'"? The persistence question results then just a verbal dispute, which can be solved through a conceptual analysis, focusing on our linguistic usage rather than on metaphysical issues. This way, a Lewisian perdurantist account of personal persistence dissolves the metaphysical puzzle into a mere conceptual one¹²⁴.

Now, the question is whether we may accept such a conventionalism about persons and personal persistence. May we accept that the existence and survival of persons is just a conventional matter? And besides that, the overpopulation of entities in our ontology entailed by a Lewisian perdurantist approach? Next section will be devoted to introduce some alternative perdurantist approaches to personal persistence, focusing on the way they may avoid such undesirable consequences.

1.9. Kinds of perdurantism

Although Lewis's approach to personal persistence has been understood as the standard way for perdurantism to deal with the persistence of persons, there are other solutions that deserve attention and that are distinguished by their answers to the diachronic composition question (see section 1.6.). One extreme position emerges, for instance, if one argues that composition never occurs: given various times and various temporal parts existing at each, there is no minimal D-fusion of those things at those times such that this minimal D-fusion is a person. And *a fortiori* there is no condition of diachronic composition for persons. Abandoning the principle of unrestricted diachronic composition in favor of a nihilist one, it follows a stage theoretic account of personal persistence (see section 1.3.3.). Since I am exclusively concerned with options for perdurantism with respect to personal persistence, I will not discuss a nihilist solution to the diachronic composition question, which leads to a stage theory. Such view is not

¹²⁴ A similar idea is defended in (Sider 2001a, 9).

obviously incoherent and has been defended by several temporal parts metaphysicians (and in particular by “ex-perdurantists”). In the next chapter, I shall provide with an explanation on the reasons why perdurantists might have been inclined to embrace a stage theory, and I shall advance a possible way to prevent such a metaphysical shift in the future debate, focusing on the priority relations among temporal parts and perdurant wholes.

Setting aside a stage theory and its nihilist account of composition, there are other alternatives to the Lewisian perdurantist approach and its commitment to the principle of unrestricted diachronic composition. Such alternatives might be found between the Scylla of universalism and the Charybdis of nihilism, claiming that *the composition of temporal parts into perdurants only obtains under certain circumstances*. Call this kind of approaches “moderate” or “restrictive” perdurantism, in virtue of its moderatism/restrictiveness about the diachronic composition of temporal parts. A moderate account of perdurantism denies that composition always occurs and denies that composition never occurs. The notion of “moderate” in relation to composition has been used by van Inwagen – cf. (van Inwagen 1987, 34, 1990b, 61–62), who distinguished “moderate answers” and “extreme answers” to the special composition question, referring to his own view as an instance of the former, and then to nihilism and universalism as instances of the latter. According to van Inwagen, a moderate answer to the special composition question is such that “It is at least possible that there are objects that compose something, and it is also at least possible that there are objects that compose nothing” (van Inwagen 1987, 40).¹²⁵ A moderate approach to the composition question leads to a sparse ontology, which countenances the existence of fewer objects than the ones recognized by a mereological universalist. The notion of ‘moderate’ applied to composition appears then in (Sider 2001a, 156), where the author refers to (Wiggins 1980), (Thomson 1983, 1998), and (Burke 1994a, 1994b), as advocates of a moderate view¹²⁶. Still one should notice that the latter are not advocates of a moderate perdurantism, since they do not accept temporal parts at all: their accounts are moderate indeed, but endurantist. As a matter of fact, this is in line with the standard understanding of theories of persistence, according to which endurantism and perdurantism are respectively paired with restrictiveness and liberalism about composition (see footnote 105 above). This is among others the thesis defended by Kristie Miller, who argued that “four dimensionalism in its most common variety, perdurantism, is incompatible with the

¹²⁵ See also (Markosian 1998a, 227), who defines moderate and extreme answers to the special composition question as follows: “A is a *moderate answer* to SCQ =df (i) A is an instance of (S1), (ii) A entails that it is possible for two or more nonoverlapping objects to compose something, and (iii) A entails that it is possible for two or more nonoverlapping objects to fail to compose anything. A is an *extreme answer* to SCQ =df (i) A is an instance of (S1), and (ii) A is not a moderate answer to SCQ.” [where (S1) stands for the schema to answer SPQ, namely “Necessarily, for any xs, there is an object composed of the xs iff ____”].

¹²⁶ For “restrictiveness”, specifically applied to theories of persistence and opposed to “liberalism”, see (Magidor 2016, 511ff). In what follows, I will use “moderate” and “restrictive” interchangeably to label the kinds of perdurantism that reject both unrestricted composition and nihilism about composition.

view that ontology is sparse” (K. Miller 2006a, 31), and hence that universalist perdurantism is the only kind of perdurantism we may accept.

However in a recent paper Magidor aimed at rejecting such a straightforward connection between theories of persistence and accounts of composition, recognizing besides the classic “liberal perdurantism” (what I called Lewisian perdurantism) and “restrictive endurantism” some mixed views, i.e. “liberal endurantism” and “restrictive perdurantism”¹²⁷ – cf. (Magidor 2016). Setting aside liberal endurantism which goes outside the scope of my work on perdurantist accounts of personal persistence, I will consider the advantages of moderate perdurantism. The first advantage of a moderate perdurantism is that it is not committed to a multitude of temporarily-coincident four-dimensional entities and persons, according better with our common sense: moderate perdurantists may argue that there are perduring tables, cats and persons, but deny the existence of gerrymandered entities such as the fusion of my left half body yesterday, and the Empire State Building today. Persons in particular are some specific four-dimensional entities, which are constituted by those temporal parts that are unified in virtue of a determinate R-relation. Lewis’s overpopulated world makes place to a soberer and less ornate ontological landscape, reconciling in a way the perdurantist approach with a Quinean taste for deserts. Second, a moderate perdurantism may avoid a conventionalist account of persistence, according to which persistence issues rest upon some sort of conventional matter, and more specifically on the way we account for the notion of “person”. If temporal parts compose a certain person under certain conditions rather than others, and those conditions are ontological rather than semantical, the persistence question in terms of the diachronic composition question results metaphysically substantive.

There are different ways for moderate perdurantism, which differ on the basis of the specific circumstances under which temporal parts compose a perdurant person. I suggest distinguishing them into two general positions, that I call *brute moderate perdurantism* and *complex moderate perdurantism*. In a nutshell, a *brute moderate perdurantism* (hereafter *brute perdurantism*) claims that some temporal parts composing a perdurant person is a brute fact - that is to say a fact that is not reducible to any more fundamental condition, whereas a *complex moderate perdurantism* (hereafter *complex perdurantism*) claims that some temporal parts existing at various times constitute a perdurant person if (and only if) certain conditions are satisfied, which are not conventional. Chapter 3 will be devoted to a more detailed analysis of these accounts and to the defense of a moderate form of perdurantism. In sections (3.2-3.4) I will examine different kinds of complex perdurantist approaches, which differs on conditions of diachronic composition of temporal parts into perdurant persons.

¹²⁷ (K. Miller 2006b, 2008b) defends a form of universalist endurantism. According to (Magidor 2016, 526–27), universalist endurantism is not a form of liberal endurantism, since universalism of composition is a necessary but not sufficient condition for liberalism of composition. As far as restrictive perdurantism is concerned, (Magidor 2016: 526, note 10) refers to (Balashov 2003a) as a paradigmatic case. For further instances of restrictive perdurantism, see chapter 3 of this work.

CHAPTER 2. Temporal parts of persons and the priority of the wholes

In metaphysics, the relation between parts and wholes is often characterized as ‘intimate’ and ‘innocent’. It is intimate, for the whole goes where its parts go; the whole has the location its parts have (as the ship is located where the keel, the hull, and all other parts are located, so we do where our hands, torsos, heads, etc. are located).¹ And the parthood relation is innocent for the whole appears ‘nothing over and above’ the parts constituting it (i.e. if we want to buy the ship either we pay for all its parts separated or we pay for the whole ship; paying both for the parts and the whole would be a real scam...)². Suppose we accept both the intimacy and innocence of parthood. Still, one may wonder which side of the parts-whole relation is more fundamental. Roughly, the question is: are the parts more fundamental than the whole or is the whole more fundamental than its parts? Or neither?

At first sight, the answer appears rather intuitive: parts are more fundamental than wholes, for wholes depend on their parts. Parts compose the wholes, so that the wholes exist in virtue of the existence of their parts.³ The idea that parts are more fundamental than the wholes they compose seems able to account for both the intimacy of the relation of parthood (since the parts ground the wholes, the wholes are located where their parts are) and its innocence (since parts are fundamental entities and wholes are derivative, we have no reason to count them twice)⁴. Although some different views have also been defended, arguing for instance in favor of the priority of wholes over their parts (and in particular of the universe as a whole)⁵, the idea that parts are more fundamental than the wholes they compose is still strong and steady.

¹ (Sider 2007), (Cameron 2014), and (Loss 2016) refer to this relation as the “intimacy of parthood”.

² On the “ontological innocence” of mereology, see (Lewis 1991, 83).

³ The literature on grounding has been expanding significantly during the last years. For an introduction on the notion of grounding and metaphysical dependence see (Correia and Schnieder 2012), (Clark and Liggins 2012), (Trogdon 2013), and (Bliss and Trogdon 2016).

⁴ It is worth to point out that the innocence of the theory according to which parts are more fundamental than wholes obtains just as far as one endorses a *deflationist approach* of derivative entities (according to which derivative entities are “nothing over and above” the fundamental entities grounding them, which are the only entities that exist). However, the view that parts are more fundamental than wholes is not innocent if it goes with an *inflationist approach* of derivative entities (according to which fundamental entities are not the only things that exist, derivative entities existing as well). I will go back to the distinction between deflationist and inflationist approaches of derivative entities in section 2.1. below.

⁵ See for instance (Schaffer 2007, 2010).

What I want to do in this chapter is to discuss whether the same kind of priority ought to be recognized when we consider the relation between temporal parts and the perdurant objects they compose (i.e. the ‘perdurant wholes’). In particular, I shall defend the view that perdurants are more fundamental than the temporal parts constituting them. I will call *top-down perdurantism* the view according to which perdurant wholes are more fundamental than their temporal parts, opposed to what I will call bottom-up perdurantism (which claims that temporal parts are more fundamental than perdurant wholes) and flat-perdurantism (according to which there are no priority relations among temporal parts and perdurant wholes). To achieve my aim, I analyze the reasons one might have to reject the priority of the wholes over their temporal parts, and I argue they do not offer any definite arguments against the priority of perdurant wholes. I conclude that top-down perdurantism is not just plausible, deserving hence more attention, but in fact has significant advantages over other mainstream perdurantist accounts of persistence.

Let me point out that although I will start investigating the top-down approach with respect to part-whole in general, here I will just focus on the priority of a specific kind of perdurants over their temporal parts, namely persons, which is the topic of my work. The priority of perdurants persons (rather than the priority of perdurant objects) is intended to leave open the possibility of different relations of priority between (temporal) parts and (perdurant) wholes when dealing with other objects. I am not saying that this is what we ought to accept, nor that it is likely to define different priority relations for persons and objects. What I am saying is that the priority of perdurant persons over their temporal parts may be consistent with the thesis that temporal parts are more fundamental than other perdurant entities. It follows that top-down perdurantism about persons might be accepted also by bottom-up perdurantists about ordinary objects, artifacts, and other non-person-things. Nonetheless, I do not exclude (and on the contrary I tend to believe) that the same argument for top-down perdurantism of persons can be applied to material objects without restriction. But this goes out of the scope of my research, and for this reason I am not going to discuss that further.

2.1. Composition over time and priority relations

I see three ways for advocates of ontology of temporal parts to explain what kind of relation of priority obtains among temporal parts and perdurant wholes. In order to define these approaches on the market, I suggest focusing on the way the following two questions may be answered:

- Q1)** Is there any priority relation among temporal parts and perdurant wholes?
- Q2)** If so, what is more fundamental?

A first alternative arises from the negative answer to question **Q1**): there is no priority relation among temporal parts and perdurant wholes. According to this approach, no relation of fundamentality holds between temporal parts and perdurants: both temporal parts and perdurant objects exist and are ontologically on the same level. This is, for instance, what Heller has in mind when he claims that “temporal parts and the wholes that they compose are *ontologically on a par*” (Heller 1990, 22, italics added); and this is what other mereology scholars have in mind when asked about the way grounding applies to parts and wholes⁶. For no priority relation obtains between a whole and its parts (both synchronically and diachronically), neither wholes nor parts are more fundamental.

[...] because a thing’s parts are no more fundamental than the thing itself, existence of four-dimensional objects in no way depends upon their being built up out of instantaneous objects (Heller 1990, 6)

It seems that the reason that led these metaphysicians to reject any priority relations among parts and wholes in general (and hence between temporal parts and perdurant wholes) is that it is inconsistent with another fundamental thesis, namely the thesis that *composition is identity*. This thesis, usually labeled ‘composition as identity’ (CAI), claims that any object is identical to the parts that compose it⁷. This means that if x is composed by the ys, then x is identical to the ys. Applied to temporal parts and perdurant objects, it follows from CAI that any perdurant object is nothing over and above its temporal parts. The perdurant object is identical to its temporal parts. But if so, then the perdurant object is on the same level of its temporal parts, and hence no priority relation obtains among the perdurant object and its temporal parts (I’ll come back to this point below in section 2.3.2.). In other words, the alleged incompatibility of CAI with any priority relation between parts and wholes led some supporters of composition as identity to endorse a “flatworldism⁸ about persistence”, and then to endorse what I call a “flat perdurantism”

⁶ For an account in which part-whole relation does not involve any kind of priority see (Varzi 2014, 2016).

⁷ Composition as identity is usually distinguished into a strong version (composition *just is* identity) and a weak version (composition *is a lot like* identity). The distinction between a weak and a strong version of composition as identity goes back to (Lewis 1991, 83ff). For an introduction on composition as identity, see (Cotnoir 2014) and (Wallace 2011a, 2011b).

⁸ The notion of ‘flatworldism’ appears in (Bennett 2011, 28). For the discussion of a mereological instance of flatworldism see (Loss 2016, 495). I notice in passage that flatworldism *per se* does not require the denial of levels of fundamentality. Besides a *deflationary flatworldism* that rejects the existence of levels of reality and takes everything to be fundamental (see (van Inwagen forthcoming)), another form of flatworldism seems possible, namely an *inflationary flatworldism* (I am grateful to Alex Skyles for pointing me out this distinction). Although accepting the distinction between fundamental and derivative levels of reality, an inflationary flatworldism is such that it takes everything to fall either on the level of fundamental things, or on the level of derivative things. Even if coherent, I cannot think of any instance of inflationary flatworldism, so that I do not discuss it further.

(hereafter PERD \leftrightarrow): perdurant objects exist and are as fundamental as the temporal parts composing them. Applied to persons and their temporal parts, this view argues that perdurant persons exist and are as fundamental as the temporal parts composing them.

A different position emerges by claiming that **Q1**) there is a priority relation between parts and wholes, and **Q2**) parts are more fundamental than wholes. I call this approach *bottom-up perdurantism* (hereafter PERD \uparrow). According to PERD \uparrow the parts ground the wholes, and the wholes depend on their parts.

As for the relation between parts and wholes in general, perdurantists have usually endorsed, more or less explicitly, this kind of approach, taking for granted that temporal parts are more fundamental than the perdurant objects they compose⁹. One may argue, in fact, that the priority of temporal parts is embedded in the very definition of persistence within an ontology of temporal parts: objects persist *by having* temporal parts¹⁰. Since locutions such as ‘by having’ and ‘in virtue of having’ are largely used in the metaphysics of grounding, it is not surprising that many perdurantist have endorsed PERD \uparrow , spending not much attention on priority issues concerning temporal parts and perdurant objects.

The same would apply to personal persistence within an ontology of temporal parts. Perdurant persons persist by having temporal parts, and these temporal parts of persons are more fundamental than the persons they compose. This seems, for instance, what Miller has in mind when she deals with the relation between the metaphysical status and the normative status of persons.

The point is that we never find the entire four-dimensional object desiring, deliberating and acting. For the entire four-dimensionalist object that is a person, is the sum of small entities each of which have *different* desires, and act in *different* ways to bring about those desires. It is the smaller entities – person-stages – that deliberate about the desires of their local person-stages, and it is later person-stages that act to bring about those desires. Persons, understood as entire four-dimensional entities, are simply not the right sort of thing to do any deliberating or acting. They are not the locus of decision or action. So when we worry about what it is that grounds prudential reasons, we should be worrying about what it is that grounds the prudential reasons of person-stages, even though, of course,

⁹ See, inter alia, (Sider 2001a), (Hawley 2001), and (Wasserman 2016).

¹⁰ On the explanatory conception of perdurantism, see section 1.3.2. above.

four-dimensional persons have reasons at time *in virtue* of the reasons their person-stages have at those times. (K. Miller 2010, 575)^{11 12}

Bottom-up perdurantists conceive perdurant persons as the sums of temporal parts, sums that exist in virtue of those smaller entities. It is important to notice that the priority of the parts over the wholes should be intended within this account as a relation of dependence, rather than an existential priority: in fact, although grounded in the temporal parts, the wholes still exist, and are listed into the inventory of the world. Understanding the priority of parts in terms of metaphysical dependence rather than existential priority prevents any advocate of PERD \uparrow to fall into a stage-theoretic view.

As seen above in section 1.3.3., according to a stage theoretic view composition never occurs, so that stages (i.e. what for perdurantism are instantaneous temporal parts) are the only things that exist in the world. In this case, stages have an existential priority over the wholes, which are derivate entities and exist only in a loose and popular sense. This means that persons are the stages themselves, and not the perdurant wholes composed of these stages (since no wholes exist strictly speaking). This is the substantial difference between a stage-theoretic approach and a PERD \uparrow , a difference which is metaphysic, and not just a matter of semantic¹³.

Still, I think that PERD \uparrow and a stage theory are strictly connected. More specifically, I think that a commitment to a PERD \uparrow offer a fertile ground for the development of a nihilist approach to diachronic composition of temporal parts, and hence a stage-theoretic approach to personal persistence. Stage-theorists seem glad to agree with

¹¹ One may object that this is not a clear case of the priority of parts over the perdurant person, for it concerns nothing but *the activity* of the temporal parts: the desires, deliberations, and activities of the whole reduce to the desires, deliberations and activities of the temporal parts. In other words, one may argue that the fact that temporal parts are more fundamental at the level of action does not entail any priority on the metaphysical level. Although I agree that the two issues need to be distinguished (for the activity/deliberation/desire of the parts being constitutive of the activity/ deliberation/desire of the whole does not seem to entail the parts being more fundamental than the whole), I think that Miller's account might be correctly understood as an instance of a PERD \uparrow about persons.

¹² One may wonder whether the existence of perdurant persons actually clashes with the strong conventionalism about persons defended in (K. Miller 2010, 2013), according to which, strictly speaking, there are no persons. The nature of persons, she claims, is determined by our moral and prudential capacities, and so that "had those practices been different, different persons might have existed with different persistence conditions" (p. 592). Problems of personal persistence reduce to cases of semantic indeterminacy: our conflicting intuitions rest upon the notion of 'person' been indeterminately referred to multiple equally good candidates (such as 'human animal' and 'psychological continuous entity'). Our linguistic practices been different, there might have been determinate whether persons survived or not. I will discuss conventionalism about persons in perdurantist approaches in the last chapter. What I want to argue here is that conventionalist views about persons (and any other kind of entity) is compatible with a perdurantist account, according to which objects are four-dimensionally extended over time. For a clear defense of a perdurantist and conventionalist account of objects, see (Heller 1990).

¹³ Note that here I refer to the so called "austere version" of the stage theory – see above section 1.3.3.

bottom-up perdurantists on the priority of parts/stages over the wholes¹⁴; what they reject is any ontological commitment to any 'up'. As things stand, the difference between a standard PERD↑ and a stage theory may be explained in terms of a different way to understand the priority relation and the status of derivative entities. On the one hand, PERD↑ suggests, if not entails, an *inflationist account* of derivative entities - so, that perdurant wholes are accepted along with the more fundamental temporal parts. Otherwise said, if PERD↑ is true, perdurant wholes exist as temporal parts do, although the former derives from the latter. On the other hand, stage theory suggests a *deflationist account* of derivative entities, according to which only stages exist, but diachronic wholes don't. If this is right, the theoretical shift to a stage theory carried out by some bottom-up perdurantists like Sider may be explained by the commitment to a deflationist – rather than an inflationist – approach towards perdurant objects as non-fundamental entities.

The idea that stage-theoretic accounts of temporal parts have been based on the alleged priority of parts over the wholes is not new, and appeared also in (Heller 1990). Dealing with some arguments against the ontology of temporal parts, Heller points out that many of these arguments are based on the idea that temporal parts are more fundamental than the wholes they compose. This would have led endurantists like Chisholm to take any ontology of temporal parts to be consistent with the idea that wholes are merely derivative entities, and hence conventional objects that should be removed from our ontology¹⁵. This consequence appears unacceptable for those who want to defend the unconventionality and existence of things persisting through time (or at least the unconventionality and existence of some things persisting through time, such as persons), and hence a good reason to discard an ontology of temporal parts. However, as Heller argues, this consequence does not follow from any ontology of temporal parts, being rather the consequence of the idea that temporal parts are more fundamental than the perdurant wholes they compose.

This argument [the one advanced by Chisholm against temporal parts] requires at least temporal parts be ontologically more basic than the whole that they compose. It is only by convention that the whole exists at all. Our conventions allow us to act as if there were enduring wholes; they allow us to treat certain momentary objects as if they compose an enduring whole. [...] Someone holding such a view [the priority of parts over the wholes] would be reasonable to accept the Edwardsian conception of temporal parts [i.e. an account of temporal parts as momentary stages created ex nihilo by God at every moment]¹⁶. But I do not accept the background supposition of three-dimensionality. *On*

¹⁴ One may argue that a stage theory should be better characterized as the denial of the question Q1), namely as the denial of any priority relation among parts and wholes. Since wholes do not exist, no priority relation obtains. Even if correct, this is just another way to characterize the position, having no consequence on the defense of a top-down perdurantism (which I will discuss below).

¹⁵ See (Chisholm 1971). On the priority of parts over wholes, see also (Chisholm 1973).

¹⁶ (Edwards 1758). For the reference to Edwards, see (Chisholm 1971, 12).

my account temporal parts and the wholes that they compose are ontologically on a par.
(Heller 1990, 22, my italics)

Heller's idea is then that Chisholm's critical account of temporal parts as the momentary objects that "built up" longer-lasting objects by convention is based on the supposition that temporal parts are ontologically more basic. But this supposition, which may lead perdurantists to a more radical stage theoretic view, is not guaranteed at all. Although I agree with Heller that the alleged priority of parts constitutes a weak point for any perdurantist approach that wants to resist a nihilist account of persistence within an ontology of temporal parts, I will argue in favor of a different alternative in defense of perdurantism, based on the priority of the perdurant wholes over their temporal parts. I call this view *top-down perdurantism*.

2.2. Top-down Perdurantism

Top-down perdurantism (hereafter PERD↓) shares with PERD↑ the idea that there is a priority relation among parts and wholes, answering positively to question Q1). However, it differs from the latter for it reverses the order of the relata concerning the priority among temporal parts and perdurant entities: perdurants are more fundamental than their temporal parts, and not vice versa.¹⁷ Applied to personal persistence, PERD↓ argues that perdurant persons are more fundamental than their temporal parts.

A first possible objection against such a perdurantist alternative is that it clashes against the explanatory conception of perdurantism, namely that 'things persists *by having* temporal parts'. Otherwise said, one may argue that the very idea of PERD↓ is misleading, for the priority of perdurant wholes over their temporal parts would entail the denial of perdurantism as the theory that things persists by having temporal parts. It follows that accepting the very notion of perdurantism would commit us to a PERD↑. This is what Wasserman seems to have in mind, when he argues that the view that temporal wholes are more basic than temporal parts is an instance of the denial of the

¹⁷ Let me point out that a similar view has been considered by Storrs McCall as well, who defends the possibility of a form of perdurantism in which four-dimensional objects are basic and stages are derivative abstractions – cf. (McCall 1994, 211–14). [For a criticism, see (K. Miller 2006a).] In spite of their similarity, I think there are several differences between my view and the one defended by McCall, the main ones being the following: first of all, I do not agree with the deflationist account of theories of persistence defended by McCall, according to which endurantism and perdurantism are equivalent theories at the end of the day– cf. (McCall 1994, 215–16). Second, my top-down perdurantism is committed to the existence of temporal parts, whereas McCall's sparse perdurantism seems to reduce temporal parts to abstractions which derive from the division of the four-dimensional volume "just as the earth can be divided into spatial parts by meridian lines" (K. Miller 2006a, sec. 3.1.).

explanatory conception of perdurantism - i.e. that things persist by having temporal parts¹⁸.

However, I think that such an objection against PERD \downarrow , as well as Wasserman's characterization of the denial of perdurantism in terms of the view in which continuant wholes are more basic than temporal parts, rest upon the confusion between two kinds of dependence, namely between what I call the "persistence dependence" and the "existential dependence". They may be defined as follows:

PERSISTENCE DEPENDENCE (PD): the dependence of *the persistence of the whole perdurant* upon its temporal parts.

EXISTENTIAL DEPENDENCE (ED): the dependence of *the existence of the whole perdurant* upon its temporal parts.

One may reasonably wonder whether the distinction between (PD) and (ED) is an instance of the more general distinction between two kinds of ontological dependence, namely between *existence dependence* and *essence (or identity) dependence*.¹⁹ ²⁰ On the one hand the existence dependence of an entity x concerns *what grounds the existence*

¹⁸ "One can accept the first claim [the ontological] while denying the second [the explanatory]. [...] One could, for example, take facts about temporal parts to be grounded in facts about temporal continuants, rather than vice versa. This would be a view on which temporal wholes are more basic than temporal parts." (Wasserman 2016, 245, fn. 7)

¹⁹ For an introduction of this distinction, see (Tahko and Lowe 2016). (Simons 1987, 254) refers to the same distinction by contraposing ontological dependence to functional dependence: "There are in particular two general families of dependence concept: one concerns *ontological* dependence, the inability of an object to exist at all unless another object exists, the other concerns relations of dependence or determination among determinable characteristics of objects making up a whole. These relations belong to the general category of *functional* dependence."

²⁰ In a recent paper Sattig focuses on a different fundamental relation in mereology, namely *generation*, understood as the strongest explanatory link in composition (Sattig manuscript). Then, he distinguishes two accounts of generation, namely the *existential account* and an *essential account*. He defines these two accounts as follows: "First, the existentialist account: by virtue of composing a whole, the parts ground the existence of the whole. Second, the essentialist account: by virtue of composing a whole, the parts ground the essential kind of the whole, but not its existence." (Sattig manuscript, sec. 1). There are two substantial differences between Sattig's distinction and the one I am dealing with: first, Sattig considers the relation of generation, whereas I consider the relation of dependence; and second Sattig does not focus on diachronic identity, whereas I do. Nonetheless, I think it is an interesting question whether and how the analysis of the distinction between persistence dependence and existence dependence may be adapted to generation as well. This might lead, for instance, to recognize a distinction between a "persistence generation" and an "existential generation", where a "persistence generation" does not appear reducible to an essential generation, for similar reasons to the ones advanced when analyzing persistence dependence as a *sui generis* form of essential dependence. In fact, if composition generates the persistence of x (which is what "persistence generation" would claim), then it would generate the existence of x as well - at least as far as persistence is neutrally understood as "existence at various times". Reasons of space force me to leave the discussion of this idea for another occasion.

of x . To say that ' x *existentially* depends on the fact that Φ ' is to say that x 's existing depends on the fact that Φ . On the other hand, the essence dependence of an entity x concerns *what defines the essence of x* , i.e. its identity and nature. Thus, to say that ' x *essentially* depends on the fact that Φ ' is to say that x 's being such and such depends on the fact that Φ . While (ED) is a form of existence dependence which concerns the relation between perdurants and temporal parts, it is less obvious what we should say about (PD). (PD) seems in fact a kind of middle ground between existence dependence and essence dependence. On the one hand, it is not existence dependence, for it concerns the dependence of the *persistence* of wholes upon their temporal parts rather than their *existence* simpliciter (which is what ED concerns). On the other hand, it cannot just be tagged as a form of essence dependence, for it does not seem to concern the instantiation of some qualitative properties that constitute the nature and identity of a certain entity x . (PD) differs in fact from standard cases of essence dependence, like for instance the essence dependence of a molecule 'having a certain mass m ', that is instantiated in virtue of the molecule being constituted by a certain number of atoms of mass g_1, g_2, g_3 , etc.; or even like a surface 'being red' which is instantiated in virtue of the fact that the surface is illuminated and reflects the electromagnetic radiation of light with a certain wavelength. Although *sui generis*, I claim that (PD) is a form of essence dependence.²¹ To see why, let us focus on the notion of persistence. As I have argued above in section 1.3., a very basic and widely accepted characterization of persistence is the one in terms of "existence at multiple times" - cf. (Lewis 1986: 202). The predicate "to exist at" substantially differs from "to exist" simpliciter, since the latter but not the former is expressed by the existential quantifier \exists . The predicate "to exist at" points out a relational property of the entity in question, usually its being located at a space-time point or interval. It follows that the predicate "to persist" is a derivative predicate, resting upon the instantiation of the property of being located at and the fact that it is instantiated at multiple (space)times. If this is correct, (PD) concerns a specific kind of essence dependence of material entities, namely the dependence of their *being located*

²¹ Even accepting the distinction between ED and PD, some may prefer to leave essence out of discussion, and reject the proposal of understanding PD as a form of essence dependence (thanks to Thomas Sattig for suggesting this option). In a nutshell, one may reject that PD is a kind of essence dependence because persistence is not essential to all continuants, as continuants could fail to persist. As far as the distinction between ED as an explanation of the absolute existence of a perdurant and PD as an explanation of the persistence of a perdurant is accepted, I may accept that. Nonetheless, I do not think that the fact that persistence is not essential to certain continuants leads to reject that PD is a form of essence dependence. Take a different case of essence dependence, such as the essence dependence of a molecule having a certain mass m which is instantiated in virtue of the molecule being constituted by a certain number of atoms of mass g_1, g_2, g_3 ; or a surface being red which is instantiated in virtue of the fact that the surface is illuminated and reflects the electromagnetic radiation of light with a certain wavelength. It seems reasonable to say that neither "having a certain mass m " nor "being red" are essential respectively to the molecule and to the surface, but still they are cases of essence dependence. Thus, if we admit that they are indeed cases of essential dependence, PD is also a case of essence dependence.

such as such in virtue of the fact that Φ – that in this case is the fact that they have temporal parts located during the interval of their existence. As a form of essence dependence, (PD) claims that the fact that a material entity exists at different moments in time depends on the fact that x has temporal parts²².

Perdurantism, as the theory that things persist by having temporal parts, is committed to (PD), but is neutral on (ED); the kind of perdurantism that along with (PD) accepts (ED) is PERD \uparrow . It follows that PERD \downarrow cannot be discarded as in tension with the very definition of perdurantism, for it is perfectly consistent with (PD), although accepting the reverse of (ED), call it (ED \downarrow), namely the dependence of the existence of temporal parts upon the whole perdurant.²³ In other words, PERD \downarrow accepts that the *persistence* of the whole is explained by (perhaps even ‘grounded in’) the existence of its temporal parts, but it does not accept that the *existence* of the whole itself depends (or is grounded) on the existence of its temporal parts. To appreciate the difference between these two kinds of dependence in PERD \downarrow , consider their negations. i) To deny the reverse existential dependence of PERD \downarrow (namely ED \downarrow) is to deny that temporal parts depend on perdurant wholes: this leads to PERD \uparrow or PERD \leftrightarrow , which are both consistent with the claim that things persist by having temporal parts. ii) To deny the persistence dependence of PERD \downarrow (namely PD) is to deny that the persistence of the wholes depends on their temporal parts: this does not lead to PERD \uparrow , or PERD \leftrightarrow , but rather to some non-standard view of persistence according to which, for instance, the perdurants’ persistence and their having temporal parts are not related by any kind of priority relation (call it “autonomism of persistence and composition”), or according to which the fact that perdurants have temporal parts depends on their persistence (call it “reverse perdurantism”)²⁴. These features of PERD \downarrow are particularly significant for they mark an important difference between PERD \downarrow and the endurantist approach.

Three things are worth consideration. First, it should be noticed that the distinction between persistence dependence and existential dependence is not a prerogative of PERD \downarrow , for it seems to be necessary also to account for another perdurantist view which rejects the priority of temporal parts, namely PERD \leftrightarrow introduced above, which is a kind of perdurantism, for it accepts (PD), but it rejects both (ED) and its reverse (ED \downarrow).

²² Notice that the relation between “being located at” and “existing” simpliciter appears strictly related to the temporal framework one endorses: thus, “being located at” seems to entail existence simpliciter within an eternalist framework, whereas it entails tensed existence within a presentist framework. (I’m grateful to Giuliano Torrengo for pointing that out to me).

²³ I note incidentally that considering the ontological conception of perdurantism – i.e. the fact that temporal parts exist – PERD \downarrow is able to account for it, as far as it is not committed to any existence priority of the wholes. To say that the perdurant wholes are more fundamental than their parts is not to say that only the perdurant wholes exist (accepting hence the endurantist claim that temporal parts do not exist), nor that they have a higher degree of existence than their parts. This is because, as I claimed above in section 2.1., the relation of fundamentality should be taken as a relation of dependence, and not of existential priority, so that even if the parts depend on the wholes, the parts exist.

²⁴ For an analysis of some non-standard views about persistence, see (Buonomo and Torrengo manuscript).

Second, PERD↓ raises serious problems for a stage theoretic account, which is committed to nothing but stages in the world. In fact, although a stage theory takes the priority of temporal parts endorsed by PERD↑ as a first step to pursue the complete elimination of perdurant wholes (considering dependence in terms of existential priority), such a possibility does not appear viable if we accept PERD↓. If perdurant wholes are more fundamental than their temporal parts, then perdurant wholes do exist - at least as much as their parts do. And if perdurant wholes exist, the austere version of stage theory, which rejects perdurant wholes, is false. Being inconsistent with a stage-theory, a PERD↓ would offer a defense of a perdurantist approach within an ontology of temporal parts²⁵. This is the main issue of my defense of PERD↓ applied to personal persistence: arguing in favor of a perdurantist approach about persons, against the stage theoretic deviation favored by the standard bottom-up view. In what follows, I will not introduce any definitive argument in favor of PERD↓ and against the other perdurantist approaches on the market. My defense of PERD↓ is in fact more tentative than my defense of perdurantism in general. Still, I aim at showing that PERD↓ deserves more attention as a viable perdurantist alternative. In order to do that I will do two things. First, I will analyze and reject some possible arguments against PERD↓ applied to persons; and second, I will discuss some advantages of PERD↓ in accounting for personal persistence.

Finally, one may observe that PERD↓, when applied to persons²⁶, shares an idea that is commonly accepted by endurantists, namely that persons are fundamental entities²⁷. Arguing in favor of the priority of the perdurant objects over their temporal parts, and hence the fundamentality of perdurant persons, PERD↓ may look like the perdurantist option which is conceptually closest to endurantism. Regardless of this affinity with an endurantist approach, I argue that PERD↓ about personal persistence still remains a

²⁵ One may be notice that a parallel shift to the one from PERD↑ to stage theory may concern a PERD↓ too. In particular, endorsing a PERD↓ one may be tempted to get rid of temporal parts, ending up in a form of simplism - see (Parsons 2000, 2007) and footnote 67, section 1.4 above. However, as the stage theory derived from PERD↑ is not a form of perdurantism, simplism derived from PERD↓ is a form of endurantism.

²⁶ This is because one could be a PERD↓ and yet deny that persons are perdurants, and hence fundamental entities, endorsing a sort of reverse view respect to the ones in which persons are fundamental – see note below.

²⁷ On the fundamentality of persons within endurantist accounts, see (Chisholm 1976), (van Inwagen 1990b), and (Merricks 1998, 1999b, 2001), who take persons - or living beings in general - as the only composite things that exist, being eliminativist with respect to ordinary objects. Cf. (Chisholm 1976): “[...] familiar physical things such as trees, ships, bodies and houses persist 'only in a loose and popular sense'. This thesis may be construed as presupposing that these things are 'fictions', logical constructions or *entia per alio*. [...] They are ontological parasites that derive all their properties from other things - from the various things that do duty for them. An *ens per alio* never is or has anything on its own. It is what it is in virtue of the nature of something other than itself. At every moment of its history an *ens per alio* has something other than itself as its stand-in. But if there are *entia per alio*, then there are also *entia per se*. [...] Persons, as we have seen, are *entia per se*” (pp. 97; 104; 107). Still, as several endurantists reject the fundamentality of persons (see for instance Rudder-Baker), I do not discuss whether endurantism requires people being fundamental entities, which goes outside the scope of my work.

perdurantist view, for it claims that persons *do have temporal parts* and *persist by having temporal parts*, whereas endurantism denies these claims²⁸. Moreover, it should be noticed that the priority of persons advocated by PERD↓ is a sort of “relative priority”, i.e. a priority which is relative to the temporal parts-perdurant whole relation, and that does not entail that persons are among the most fundamental (or primitive) entities. Thus, by saying that according to PERD↓ applied to perdurant persons the latter are fundamental entities, we are not committed to the idea that persons are primitive entities, but rather that persons, as wholes, have priority over their temporal parts.

To sum up, if we accept the existence of temporal parts (or stages), these are the positions on the market.

	<i>Is there any priority relation among temporal parts and perdurant wholes?</i>	<i>If so, what is more fundamental?</i>
Flat Perdurantism (PERD↔)	NO	_____
Bottom-up Perdurantism (PERD↑)	YES	Temporal parts
Stage-theory	_____ ²⁹	_____
Top-down Perdurantism (PERD↓)	YES	Perdurant wholes

2.3. Top-Down Perdurantism and classical mereology

Classical mereology is probably the best-known mereological theory, a theory which is ‘classical’ not just in virtue of its noble origins (cf. Lesniewski, Leonard, and Goodman), but also in virtue of its being “a robust starting point for anyone interested in rigorous treatments of formal part-whole relationships” (Cotnoir and Varzi forthcoming, 55). In

²⁸ I notice in passage that the same considerations may be applied to a locative account of the distinction between endurantism and perdurantism (see section 1.4. above). In this case, PERD↓ is a perdurantist view for it claims that persons are unilocated over time and persist by being unilocated in space-time (whereas locative endurantism denies that).

²⁹ I prefer to leave the box empty, rather than writing “NO”, because of the lack within (the austere version of) stage theory of one element (i.e. the existence of perdurant wholes) which appears necessary in order to make sense of the question concerning the priority relation between parts and wholes.

this section, I shall attempt to block some arguments that may be moved against the priority of perdurant wholes (in general and a fortiori of perdurant persons) over their temporal parts, on the basis of some tenets of classical extensional mereology, namely extensionality (§ 2.3.1.), composition as identity (§ 2.3.2.), and unrestricted composition (§ 2.3.3.). This way, I will argue that a $\text{PERD}\downarrow$ is consistent with classical extensional mereology.

2.3.1. Priority of the wholes and extensionality

Can two composite things have exactly the same proper parts? According to the thesis called extensionality, the answer is no. Extensionality is the thesis that whenever a thing has proper parts, it is the only thing with just those proper parts; no composite thing can have exactly the same proper parts as another – see (Cotnoir and Varzi forthcoming, 27). In other words, given some proper parts A, B, and C, extensionality says that there is only one object composed of these parts. In what follows, I am not discussing extensional mereology, its principles, advantages, and problems³⁰. Rather, I want to discuss whether an extensional mereology is compatible with any priority relation between parts and wholes, regardless of the direction of such a relation, and in particular between temporal parts and perdurant wholes. The denial that any priority relation can obtain between parts and wholes given extensionality would in fact rule out not just $\text{PERD}\downarrow$, but $\text{PERD}\uparrow$ as well, being compatible with nothing but $\text{PERD}\leftrightarrow$. To achieve this aim, I will wonder at first whether extensionality is compatible with a standard $\text{PERD}\uparrow$, according to which temporal parts are more fundamental than perdurant wholes. Then, I will consider whether extensionality is compatible with the priority of perdurant wholes over their temporal parts, and hence with $\text{PERD}\downarrow$.

Concerning the first point, namely the compatibility of $\text{PERD}\uparrow$ with extensionality, I see no reason to reject it. Extensionality is consistent with the claim that parts are more fundamental than wholes, as well as the claim that temporal parts are more fundamental than perdurant wholes. Consider a table constituted by three parts A, B and C. According to extensionality, these parts can constitute just one object, namely the table T, and no other object T', distinguished from the table T, is composed by those parts. Although this does not say anything about the relation of fundamentality between parts and wholes, it does not mean that fundamentality does not obtain in an extensional mereology. Suppose in fact that the parts are more fundamental than the wholes they compose, so

³⁰ On extensional mereology, defined in terms of parthood as a partial order (accepting the three core principles of mereology - reflexivity, anti-symmetry and transitivity) plus the strong supplementation principle (“if an object fails to include another among its parts, then there must be something that makes up for the difference”), see (Varzi 2016, sec. 3.2.). On the relation between mutual parthood and extensionality (and hence between antisymmetry and extensionality) see (Cotnoir and Varzi forthcoming, chap. 3.2).

that A, B, and C are more fundamental than the table T. There is nothing wrong in accepting this sort of priority relation, and on the same time claiming that given the proper parts A, B, and C, there is only one object composed of these parts, namely the table T. The same argument can be applied to the relation between temporal parts and perdurant wholes. Suppose we want to accept extensionality within a perdurantist framework: it follows that given some (proper) temporal parts a, b and c, there is only one perdurant object P composed of these parts. To be clear: I am not saying that perdurantism requires extensionality, but that *if* perdurantism is paired with extensionality, then there is just one perdurant composed of some proper temporal parts.³¹ Now, as for the general case, extensionality applied to perdurantism does not clash with any relation of fundamentality between temporal parts and perdurant wholes. So, given PERD \uparrow and extensionality, it follows that a perdurant P composed by the temporal parts a, b, and c, would be such that a, b, and c are more fundamental than P, and there is only one object composed of these temporal parts, i.e. P; no tension emerges from this view.

On the same way, there is no tension between PERD \downarrow and extensionality, i.e. the fact that perdurant whole P is more fundamental than its temporal parts a, b, and c, and the fact that there is only one object (i.e. P) composed of these temporal parts. At the end of the day, extensionality does not say anything about the direction of priority (if any) between temporal parts and wholes. Thus, extensionality does not entail flatworldism about composition.

2.3.2. Priority of the wholes and composition as identity

In section 2.1. above, I introduced the principle of composition as identity (CAI), according to which any object is identical to the parts that compose it, and I claimed that CAI appears to offer a good argument in favor of PERD \leftrightarrow . In this section, I will argue that CAI is also compatible with any perdurantist approach that accepts priority relations between parts and wholes, and hence it is compatible with a PERD \downarrow .

The reason why CAI seems to commit to PERD \leftrightarrow can be explained by the alleged incompatibility between CAI and the grounding approach (GROUND) applied to parts and wholes³². Applied to parts and wholes, GROUND claims that wholes *depend on/are grounded in/exist in virtue of* their parts, or vice versa, parts *depend on/are grounded in/exist in virtue of* the wholes they compose. I will use GROUND \uparrow to refer to the case in which parts ground the wholes, and GROUND \downarrow to refer to the case in which the wholes

³¹ Among the perdurantist accounts accepting extensionality, see (Lewis 1986a, 1991), (Heller 1990), (Sider 2001a).

³² On the incompatibility of CAI and GROUND, see (Bohn 2009a), (Bailey 2011), and (Cameron 2014).

ground the parts. Assumed as a strict partial ordering between entities (and in particular between facts or states of affairs)³³, GROUND is an irreflexive, transitive and asymmetric relation. The incompatibility between CAI and GROUND is often explained as deriving from the irreflexivity of grounding, which is the principle that nothing can ground itself:
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$\neg x > x$ (Irreflexivity of grounding)

This principle entails the following corollary, which claims that if x grounds y, then x is not identical to y:

$x > y \rightarrow \neg x = y$ (Corollary of Irreflexivity of grounding)

Thus, if the parts ground the whole (or vice versa if the whole grounds the parts), then the parts are not identical to the whole. However, this is in contrast with CAI, according to which the whole is identical to its parts. The argument runs then as follows³⁵:

- | | |
|---|--------------------|
| 1. x is composed of the (plural) ys | (Assumption) |
| 2. x is identical to the ys | (1, CAI) |
| 3. x grounds the ys | (1, GROUND↓) |
| 4. x is not identical to the ys | (3, irreflexivity) |
| 5. x is identical and not identical to the ys | (2, 4) |

Applied to perdurantism and then to the relation between perdurant wholes and temporal parts, the argument against the compatibility of CAI and priority relations may sound as follows:

- | | |
|--|---------------------|
| P1. x is a perdurant entity composed of its temporal parts (a,b,c) | (Assumption) |
| P2. x is identical to its temporal parts (a,b,c) | (P1, CAI) |
| P3. x grounds its temporal parts (a,b,c) | (P1, PERD↓) |
| P4. x is not identical to its temporal parts (a,b,c) | (P3, irreflexivity) |

³³ On grounding as a relation between facts, see (Rosen 2009). For a defense of grounding as a relation that can hold between entities of different categories, see (Schaffer 2009, 2010). Since I shall understand the notion of grounding as a relation between facts (or states of affairs), I should say that “*the fact that* wholes exist is grounded in *the fact that* their parts exist” (or, vice versa). However, since this issue is rather tangential to the rest of the chapter, I will just refer to grounding between x and y, without specifying the category of these latter.

³⁴ (Jenkins 2011) discusses and rejects the irreflexivity of grounding. (Raven 2013) offers a reply.

³⁵ I borrow this argument from (Bailey 2011, 172); see also (Loss 2016, 490). Although they both consider the case in which parts are more fundamental than the wholes (so that the grounding relation in 3 is that ‘x is grounded on the ys’), the argument remains the same.

P5. x is identical and not identical to its temporal parts (a,b,c) (P2, P4)

In order to avoid the contradiction with P2, one may be tempted to reject P3, and hence any priority relation between temporal parts and perdurant wholes, in favor of $PERD \leftrightarrow$. Perdurant objects, such as persons, exist; their temporal parts exist; and since no grounding relation is compatible with CAI, perdurant objects and temporal parts are ontologically on a par. Instead of accepting this conclusion, I argue that the one above is not a knock-down argument for any perdurantism which accepts a priority relation among temporal parts and wholes, offering a defense of $PERD \downarrow$. To achieve my aim, I will apply to composition over time the strategy advanced by (Loss 2016) in favor of a form of compatibilism between CAI and GROUND, which is based on the distinction between two different kinds of plurality, namely between “scattered pluralities” and “collected pluralities”³⁶. A collected (or collective) plurality of parts is a plurality of parts taken together (i.e. the y s), and that appear in a plural fact (i.e. [the y s exist]); whereas a scattered plurality of parts is a plurality of parts that are singularly taken together (i.e. y_1, y_2, \dots, y_n), and that appears in a plurality of facts (i.e. [y_1 exists], [y_2 exists], ... [y_3 exists]) . According to Loss, the (alleged) incompatibility between CAI and GROUND rests upon a misleading interpretation of the grounding relation as a relation between wholes and *collective pluralities of parts* (i.e. y s), whereas it is a relation between wholes and *scattered pluralities of parts* (i.e. y_1, y_2, \dots, y_n).

For G+CAI, mereological sums like x are, in fact, *both* identical to the plurality of its parts *and* grounded in them. What avoids the contradiction threatened by argument A [see above Bailey’s argument] is the fact that, while a whole is identical to the *collected* plurality of its parts (that is: the fact that x exists is identical to the fact that the Y s exist), it is grounded in their *scattered* plurality (that is: the fact that x exists is grounded in the plurality of facts [y_1 exists], [y_2 exists], ..., [y_n exists] taken together). (Loss 2016, 495)

Going back to the argument above, this would lead to a different formulation of P3, namely

P3*. x grounds its temporal parts a, b, c . (P1, $PERD \downarrow$)

which means that the fact that x exists grounds the facts that a exists, that b exists, and that c exists. I use ‘ a, b, c ’ to refer to temporal parts as a scattered plurality, whereas ‘ (a,b,c) ’ refers to them as a collective plurality. For irreflexivity, it follows that

P4*. x is not identical to its temporal parts a, b, c . (P3*, irreflexivity)

³⁶ As one may notice below, Loss’s solution rests upon a characterization of grounding as a relation among facts, rather than substances.

i.e. the fact that x exists is not identical to the facts that a exists, that b exists, and that c exists. At this point, Loss argues that the passage to P4, namely that the fact that x exists is not identical to the plural fact that (a,b,c) exist is not given for free, since it requires the commitment to a principle of factual identity (FI). According to FI, the identity between a whole x and the collective plurality of parts ys entails the identity between the fact that x exists and the scattered plurality of facts that y₁ exists, y₂ exists.... y_n exists.

Factual identity (FI): if x is identical to the ys, then [x exists] is identical to the plurality [y₁ exists], [y₂ exists],..., [y_n exists]

Assuming that facts are true proposition, FI rests upon a further principle, namely the principle of proposition identity, which claims as follows:

Propositional identity (PI): if x is identical to the ys, then <x exists> is identical to the plurality <y₁ exists>, <y₂ exists>..., <y_n exists>

In turn, PI rests upon another principle, called principle of propositional fusion.

Propositional fusion (PF): if x is identical to the ys, then <x exists> is the fusion of the plurality <y₁ exists>, <y₂ exists>..., <y_n exists>

To show that the argument above does not lead to a contradiction, Loss claims that (PF) is anything but obvious, introducing the so-called *argument from plural belief*. This argument rests upon the difference between *collective beliefs* (i.e. beliefs in a collective plurality of propositions) and *distributive beliefs* (i.e. beliefs in a scattered plurality of propositions). It says that, although it is true that the belief <x exists> is identical to the belief <y₁ exists>, <y₂ exists>, ..., <y_n exists> *taken together* (i.e. collective belief), it is not true that the belief <x exists> is identical to the belief *in each* of the propositions <y₁ exists>, <y₂ exists>, ..., <y_n exists> (i.e. distributive belief). At least, there are cases in which believing that x exists differs from believing that each part of x exists.³⁷ Showing that (PF) can be false, the argument of plural belief offers an interesting way to resist the contradiction between CAI and GROUND. (PF) being false, it follows that (PI) is false; and that in turn (FI) is false. Thus, rejecting (FI), P4 (i.e. 'x is not identical to its temporal parts

³⁷ "[...] if PF were true, then it would follow not only that, for each one of the ys, a believes that y exists, but also, by generalization, that for every object x, individual y, and part z of x, if y believes that x exists, then y also believes that z exists. This, however, is clearly false: I believe that the chair on which I am sitting exists, but there are surely many parts of it about which I have no belief whatsoever, let alone that they exist. Therefore, the proposition that x exists cannot be the fusion of the propositions <y₁ exists>, <y₂ exists>, ..., <y_n exists> and PF is thus false". (Loss 2016, 493).

(a,b,c)' – [collected plurality]) cannot be inferred from P4* (i.e. 'x is not identical to its temporal parts a, b, c' – [scattered plurality]). And if P4 is not inferred, then no contradiction obtains, for the priority of perdurants over their temporal parts (or viceversa, the priority of temporal parts over perdurants) does not entail that perdurants are not identical to their temporal parts taken together. Otherwise said, the fact that a perdurant is identical to the collected plurality of its temporal parts results consistent with the existence of some kind of grounding relation between the perdurant and the scattered plurality of its temporal parts.

Let us now consider more in detail the relation between perdurant wholes, scattered pluralities of temporal parts and collected pluralities of temporal parts according to the different kinds of perdurantism.

A PERD \uparrow which is committed to CAI can be characterized by the following two claims:

CAI: x is identical to its temporal parts (a,b,c).

GROUND \uparrow : x is grounded in its temporal parts a, b, c.³⁸

Assuming PERD \uparrow and CAI, the relation between perdurant wholes and temporal parts is as follows:

$$\begin{array}{ccc} x & = & (a,b,c) \\ \uparrow & & \uparrow \\ & & a, b, c \end{array}$$

On the other hand, a PERD \downarrow which is committed to CAI is characterized by the following two claims:

CAI: x is identical to its temporal parts (a,b,c).

GROUND \downarrow : x grounds its temporal parts a, b, c.

The resulting relation schema between perdurants and temporal parts is:

$$\begin{array}{ccc} x & = & (a,b,c) \\ \downarrow & & \downarrow \\ & & a, b, c \end{array}$$

³⁸ I notice in passing that referring to facts, CAI and GROUND \uparrow would result as follows:

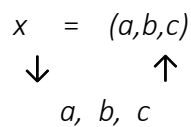
CAI: [x exists] is identical to [(a,b,c) exist] - i.e. the fact that x exists is identical to the fact that (a,b,c) exist.

GROUND \uparrow : [x exists] is grounded in [a exists], [b exists], [c exists] - i.e. the fact that x exists is grounded in the fact that a exists, the fact that b exists, and the fact that c exists.

I see one possible objection to this characterization of the relation between parts and wholes within PERD \downarrow , concerning the relation holding between the scattered plurality of temporal parts a, b, c , and the collective plurality of temporal parts (a,b,c) . One may reject as counterintuitive, in fact, that the collective plurality (a,b,c) is what grounds the scattered plurality a, b, c , for it would be similar to say that the truth of a conjunction grounds the truth of its conjuncts. One may reject that along with perdurant entities, sums of temporal parts are more fundamental than those temporal parts taken as a scattered plurality.

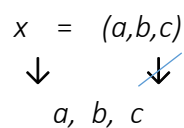
But then, is it a problem for PERD \downarrow committed to composition as identity? I argue that it is not, since PERD \downarrow committed to composition as identity can bite the bullet on this point, accepting that collective pluralities of temporal parts (which are identical to the whole perdurants) are more fundamental than their scattered pluralities. But let us consider for the sake of the argument some possible alternative accounts of the relation between collective and scattered pluralities within PERD \downarrow .

An alternative account may be that although the perdurant whole x is identical to the collective plurality of temporal parts (a,b,c) , and x grounds a, b, c , nonetheless (a,b,c) is grounded in a, b, c . In a schema, it is that



Reversing the order of dependence between the collective plurality (a,b,c) and the scattered plurality a, b, c , this account is able to avoid the problem above, i.e. the dependence of temporal parts on their sums. However, this alternative leaves itself vulnerable to another problem, namely the fact that one and the same thing (given CAI, $x = (a,b,c)$) is in opposite grounding relations with respect to the same entity, the collective plurality (a, b, c) . Thus, in order to explain the different dependence relation between the whole perdurant and the scattered plurality on the one hand, and the collective plurality and the scattered one on the other, PERD \downarrow should reject CAI (or endorse a weak version of it), which is in contrast with the aim of this section.

A further alternative may be to say that although the perdurant whole x is identical to the collective plurality of temporal parts (a,b,c) , only x and the scattered plurality a, b, c stand in a grounding relation, whereas there is no grounding relation between the collective plurality of temporal parts and the scattered plurality of the same parts. Schematically, it results that



Suppose we accept $\text{PERD}\downarrow + \text{CAI}$, and that no grounding relation obtains between (a,b,c) and a, b, c . Still, we may be asked to explain what kind of relation, if not grounding, holds between the collective and the scattered plurality of temporal parts. A tentative solution may be to say that the collective plurality (a,b,c) is identical to the scattered a,b,c , so that

$$\begin{array}{l} x = (a,b,c) \\ \downarrow \quad = \\ a, b, c \end{array}$$

This does not seem a good solution at all, for it leads either to a contradiction or to the denial of transitivity of identity. Given the transitivity of identity, from $x = (a,b,c)$ and $(a,b,c) = a, b, c$, it follows that $x = a, b, c$. But this is in contrast with the hypothesis that x grounds a, b, c , that for irreflexivity of grounding entails that x is not identical to a, b, c . To avoid this consequence, one may reject the transitivity of identity, which is a too high cost, higher than the commitment to the thesis that, given $\text{PERD}\downarrow$ and CAI , scattered pluralities of temporal parts depend on their collective pluralities, as well as on the perdurant wholes they compose.

2.3.3. Priority of the wholes and unrestricted composition

In section 1.8.1. I introduced the principle of unrestricted composition – according to which for any collection of objects, there is something that is the mereological sum (or fusion) of those objects - I considered the way it applies to temporal parts, and I argued that most four-dimensionalists, like Lewis and Sider, accept this principle. Let us now consider the consequences of accepting a principle of (diachronic) unrestricted composition while endorsing $\text{PERD}\downarrow$.

The unification of $\text{PERD}\downarrow$ and unrestricted composition leads to a form of liberal perdurantism in which a plenitude of entities are more fundamental than their parts. Thus, along with the sum of my temporal part yesterday and my temporal part today, there is also an object that is composed by my temporal part yesterday and, let say, your temporal part today, and that is more fundamental than the temporal parts constituting it. Setting aside the perplexities that may arise from this picture (such as the overpopulation of gerrymandered entities and the fact that such entities are more fundamental than their parts)³⁹, a further problem for $\text{PERD}\downarrow$ to accept the principle of unrestricted composition, is the commitment to a kind of priority monism⁴⁰.

³⁹ On the overpopulation of entities based on unrestricted composition, see section 1.8.1; on the priority relation between objects, sums, and parts, see section 2.3.2.

⁴⁰ Priority monism is defended by (Schaffer 2010).

Notice that $\text{PERD}\downarrow$ seems to differ from priority monism on one substantial matter: concerning specifically the relation between parts and wholes over time (i.e. the relation between temporal parts and perdurant wholes), $\text{PERD}\downarrow$ has no commitment to the existence of one fundamental token (the Universe, the ‘Spinozian Whole’ that grounds everything). What $\text{PERD}\downarrow$ claims is that, within an ontology of temporal parts, perdurant wholes are more fundamental than their temporal parts⁴¹. Thus, if on the one hand priority monism argues in favor of the priority of *the Whole*, $\text{PERD}\downarrow$ just commits itself to the priority of the perdurant entities (*the perdurant wholes*) over their temporal parts. $\text{PERD}\downarrow$ may be hence thought as a sort of “local priority monism”, for it concerns nothing but the priority of perdurants over their temporal parts, whereas a standard priority monism is a “global priority monism”. Take for instance an advocate of $\text{PERD}\downarrow$ which is not committed to unrestricted composition; she may accept the priority of just some kinds of composite entities (for instance the perdurant persons), without being committed to the priority of the whole universe over its parts.

The argument for the commitment to priority monism of $\text{PERD}\downarrow$ + unrestricted composition goes as follows. Given the principle of unrestricted composition, for any collection of objects there is something which is composed exactly of those objects. And among them, there is one object, which is the sum of all other objects, namely the Universe [let set aside the case of junky worlds, where there is no fusion of everything]. Moreover, given $\text{PERD}\downarrow$, the Universe as a whole is more fundamental than its parts. And since priority monism is the theory that the Universe as a whole is more fundamental than its parts, priority monism is entailed by $\text{PERD}\downarrow$ + unrestricted composition.

I see two possible ways to avoid priority monism although accepting $\text{PERD}\downarrow$ and the principle of unrestricted composition. The first way to prevent a commitment to priority monism is to deny that unrestricted composition entails the existence of the object Universe. For the universe follows from the definition of unrestricted composition ‘ $\exists x\varphi x \rightarrow \exists z F\varphi x$ ’, and the substitution of φ with a formula satisfied by all objects – such as ‘ $\exists y x = y$ ’ – I must admit I see no easy way to do that (at least as far as the world is not junky – on this issue, see (Morganti 2009) and (Bohn 2009b, 2009c)). The second one is to say that $\text{PERD}\downarrow$ concerns nothing but persons, whereas for all other objects either $\text{PERD}\leftrightarrow$ or $\text{PERD}\uparrow$ is true: perdurant persons are more fundamental than their temporal parts, whereas all other perdurants derive from the temporal parts constituting them. It follows that the object Universe, which is not a person, derives from its temporal parts as well, and then it is not fundamental. Priority monism would be so avoided, but the price to be paid is the commitment to different theories of persistence for different objects.

⁴¹ This does not mean that $\text{PERD}\downarrow$ is inconsistent with priority monism, though: in fact $\text{PERD}\downarrow$ may be consistent with priority monism in case all perdurant wholes (persons, ships, tables, and statue) depend, at the end of the day, upon a single perdurant whole. However, since this is out the scope of my analysis, I do not discuss that further.

If neither way to avoid priority monism seems to work, there are two options for $\text{PERD}\downarrow$: i) it may accept unrestricted composition and bite the bullet on priority monism; ii) it may reject unrestricted composition and endorse a kind of restrictive perdurantism (cf. section 1.9. above). Since my aim here is to show that a $\text{PERD}\downarrow$ cannot be rejected on the bases of some tenets of classical extensional mereology, i) will be enough to defend that $\text{PERD}\downarrow$ can be a viable approach also for the advocates of unrestricted composition.

2.4. Priority, properties, and Humean Supervenience

Perdurantism, in addition to unrestricted composition (see 1.8.1.), usually goes along with another principle, namely Humean Supervenience (Hawley 2015, sec. 8). Originally discussed by (Lewis 1986b, ix–xvii, 1994) and (Loewer 1996), Humean Supervenience (hereafter HS) is the doctrine that facts about which intrinsic properties are instantiated at which spatiotemporal points determine all the facts there are.

Humean supervenience is named in honor of the great denier of necessary connections. It is the doctrine that all there is to the world is a vast mosaic of local matters of particular fact, just one little thing and then another... We have geometry: a system of external relations of spatiotemporal distances between points... And at those points we have local qualities: perfectly natural intrinsic properties which need nothing bigger than a point at which to be instantiated. For short: we have an arrangement of qualities. And that is all. There is no difference in the arrangement of qualities. All else supervenes on that. (Lewis 1986b, ix)

Let a Humean property be a property whose instantiation requires nothing but a spatiotemporal point and “has no metaphysical implications concerning the instantiations of fundamental properties elsewhere and elsewhere” – cf. (Loewer 1996, 177) . The mass, the charge, and the presence (or absence) of a material particle at one point are instances of Humean properties: for instance, if spacetime point t_1 instantiate a certain mass m_1 , for any other spacetime point t_n it is not the case that necessarily t_n instantiates any specific fundamental property. Of course, the instantiation of the m_1 at t_1 may well have *causal* consequences for other fundamental properties. According to HS every contingent property in our world is instantiated in virtue of the fact that some Humean properties is instantiated.

The strict relation between perdurantism and HS rests upon both contingent and theoretical facts. On the one hand, they are tied by historical reasons, for both theses have been introduced and defended by David Lewis. But on the other hand, they are connected by a more substantial reason, namely the fact that both generally aim at

supporting physicalism - or as Lewis claims, “to resist philosophical arguments that there are more things in heaven and earth than physics has dreamt of” (Lewis 1994, 474). Physicalism is the doctrine that any fact in the world happens in virtue of some physical facts. As (Weatherston 2016a, sec. 5) pointed out, along with the thesis that all properties are instantiated in virtue of Humean properties (which are intrinsic properties of point-like objects), there is in fact another thesis of HS, namely that all the truths about a world supervene on the distribution of natural properties and relations in that world. So, for instance, according to physicalism mental states – as any other potential candidate for non-physical states – supervene on physical states. This means that any difference in mental states entails a difference in physical states, but not vice versa (since there may be different physical states on which a specific mental state *m* supervenes). In what follows, I will set aside this latter thesis of the standard (Lewisian) account of HS,⁴² focusing on the thesis of HS that facts about which intrinsic properties are instantiated at which points determine all the facts there are. In particular, I will consider the way it applies to mereology, and thus to the relation between the properties of the parts and the properties of the wholes.

Given HS, the (standard) view seems to follow that the (qualitative and relational) properties of the parts are what constitute the properties of the whole; otherwise said, the total properties of the parts grounds the partial properties of the whole. Consider the Italian flag, where the whole flag instantiates *being partially green* and the left third of the flag instantiates *being wholly green*.⁴³ Given HS, the whole flag instantiating *being partially green* supervenes on the left third of the flag instantiating *being wholly green*. The same idea seems to apply if we consider the relation between perdurant wholes and their temporal parts: if we accept a perdurantist account committed to HS, the intrinsic properties instantiated by the temporal parts are what determine all the facts of the perdurant wholes. Otherwise said, a perdurantist account committed to HS claims that all facts about a given perdurant whole supervene upon intrinsic facts about the (briefest) temporal parts constituting it: the total property of a temporal part grounds the partial

⁴² As (Loewer 1996, 179) noticed, moreover, HS and physicalism remains two distinct doctrines, neither entailing the other one. On the one hand, HS does not entail physicalism for there might be fundamental properties that are not physical, while on the other hand physicalism does not entail HS since one may argue that the fundamental properties of physics are not the properties instantiated by spatiotemporal points. I will discuss some example of physicalism without HS in the end of the section.

⁴³ Notice that there are two ways in which a property like ‘being *P*’ may be said to be partial/total. On the one hand, the distinction between partial and total properties may concern two kinds of properties, both deriving from the property ‘being *P*’, namely ‘being partially *P*’ and ‘being wholly *P*’. This understanding would be expressed by saying that ‘*x* instantiates *being partially P*’ and ‘*x* instantiates *being wholly P*’. On the other hand, the distinction between partial and total properties may concern two ways the same property may be instantiated. This would be expressed by an adverbialist construct, such as ‘*x partially instantiates being P*’ and ‘*x wholly instantiates being P*’. Although I refer to ‘being partially *P*’ and ‘being wholly *P*’ to characterize the distinction between partial and total properties, which may suggest my commitment to the first understanding of the distinction, I will stay neutral on this issue.

property of the perdurant whole. More precisely, it claims that the whole is P at a time t in virtue of having a temporal part that is P simpliciter. Let A be a perdurant apple, and a_1, a_2, a_3, a_4 the temporal parts constituting it, such that a_1 is green, a_2 is yellow, a_3 is brown, and a_4 is black. Given HS, it follows that the partial property “being green” instantiated by the perdurant A supervenes on the total property “being green” instantiated by the temporal part a_1 . And the same obtains with perdurant persons, so that the total property of being beardless of my temporal parts on 17th January 1990 and the total property of being bearded on 17th January 2018 are partial properties of myself as a whole perdurant person.

But what happens if we endorse a $\text{PERD}\downarrow$? *Prima facie*, the fact that perdurant persons are more fundamental than their temporal parts seems in tension with the idea that facts about the perdurant person supervene on facts about her temporal parts, and thus with HS. [Let me notice that one may reject this tension by arguing that supervenience is not a priority relation (thanks to Kristie Miller for pointing that out). Although I agree that supervenience is not a priority relation, I think that in this contest it is natural to consider it asymmetric and entailing a sort of priority.] Dealing with issues on the relation between parts/wholes priority and parts’ properties/wholes’ properties priority, it is worth to distinguish two understanding of this relation before going ahead. The first understanding concerns whether the *priority of the properties of a whole* over the properties of its parts entails the *priority of the whole* over its parts - i.e. whether the priority of the properties of the whole is a sufficient condition for the fact that the whole is more fundamental than its parts $[(\Phi X > \Psi_1 a, \Psi_2 b, \Psi_3 c) \rightarrow (X > a, b, c)]$. Considering the priority relations among properties of parts and properties of wholes as relations of essence dependence, while the priority relations among parts/wholes as relations of existence dependence, it follows that according to this reading, the direction of the essence dependence entails the direction of the existence dependence. If this is the case, in order to argue that perdurants are more fundamental than their temporal parts, we may just need to find some properties of perdurant wholes that are more fundamental than the properties of their temporal parts. Nonetheless, if we do not find any property of this kind, it does not follow that wholes are less fundamental than their parts, and hence that $\text{PERD}\downarrow$ is false, for the priority of wholes’ properties over parts’ properties is a sufficient, but not necessary condition for such a priority. The second understanding concerns whether the *priority of a whole* over its parts entails the priority of *the properties of the whole* over the properties of the parts - i.e. whether the priority of the properties of the whole is a necessary condition for the fact that the whole is more fundamental than its parts $[(X > a, b, c) \rightarrow (\Phi X > \Psi_1 a, \Psi_2 b, \Psi_3 c)]$. In this case, the direction of the existence dependence entails the direction of the essence dependence. Differently from the first one, this reading is such that the lack of wholes’ properties which are more fundamental than parts’ properties constitutes a serious threat for $\text{PERD}\downarrow$.

Considering the relation between $\text{PERD}\downarrow$ and HS, we should focus on the second understanding, which rests upon the broadly accepted idea that ontological priority entails necessitation. Thus, if the priority of the perdurant whole over its temporal parts entails the priority of the properties of the perdurant over the properties of its temporal parts, $\text{PERD}\downarrow$ would entail the denial of HS.⁴⁴ Consider again the case of the apple above. According to $\text{PERD}\downarrow$, the whole perdurant apple A is such that it is more fundamental than the temporal parts a_1, a_2, a_3, a_4 . But then, if metaphysical priority entails necessitation, it follows that the total properties of “being green”, “being yellow”, “being brown”, and “being black” instantiated by the temporal part a_1, a_2, a_3, a_4 supervene on the partial properties of “being green”, “being yellow”, “being brown”, and “being black” instantiated by the whole perdurant A . More precisely, it follows that a_1 is green, a_2 is yellow, a_3 is brown, and a_4 is black, in virtue of the whole being green at t_1 , yellow at t_2 , brown at t_3 , and black at t_4 . Taking into account distributional properties as more fundamental than properties of the temporal parts, $\text{PERD}\downarrow$ is then in tension with HS, according to which the direction of supervenience is the opposite one. Thus, $\text{PERD}\downarrow$ seems to substitute HS with a sort of relation of subvenience (hereafter SUB), according to which facts about which intrinsic properties are instantiated by the temporal parts supervene on intrinsic properties of the perdurants.

By rejecting HS, as many endurantists do, $\text{PERD}\downarrow$ looks one more time like a heterodox kind of perdurantism. Along with the problem of getting $\text{PERD}\downarrow$ even closer to endurantism, there are further deterrents against giving up HS. Consider the case of temperature, which is a measure of the average kinetic energy (namely a kind of energy related to motions) of atoms and molecules of an object. Given HS, one may reasonably argue that the temperature of a certain object O (say 37°) supervenes on the random motions of the particles constituting O . This is in line with the fact that differences in the temperature of O entail differences in the random motions of the particles constituting O , but not vice versa - for it is possible that the same temperature of 37° supervenes on different random motions of O 's particles. However, this latter case does not appear possible if HS is rejected in favor of SUB: if the relation goes the other way around (so that the random motions of the particles constituting O supervene on O 's temperature) it does not result possible having the same temperature (say 37°) at different random

⁴⁴ I notice in passage that the first understanding would guarantee, in contrast, a way to argue in favor of $\text{PERD}\downarrow$ based on the priority of any properties of the perdurant over the properties of its temporal parts. Moreover, this reading would allow to defend the priority of perdurants over their temporal parts even if the properties of the wholes are not more fundamental than the properties of their parts (i.e. if either the standard view is correct [according to which parts' properties ground wholes' properties]; or there are fundamental properties on both sides). In other words, this understating is such that even if the properties of the parts result more fundamental than (or as fundamental as) the properties of the whole, it does not follow that the parts are more fundamental (or as fundamental as) the whole. Nonetheless, since the idea that wholes/parts properties' priority may entail the wholes/parts priority is at least disputable and is orthogonal to the relation between $\text{PERD}\downarrow$ and HS, I will set it aside.

motions of particles constituting O (unless arguing that the subvenient fact about random motions is a disjunctive fact - i.e. the disjunction of all random motions that obtains when that temperature obtains - which seems nothing but *ad hoc*)⁴⁵. This means that for different random motions of particles there should be different temperature (37°, 37°*, 37°**, etc.), that we unify under the same label, namely '37°', just for practical reasons. This seems however in contrast with the idea that facts like temperature are genuine facts of the world: accepting PERD↓ seems hence to entail a substantial reconsideration of our image of the world.

As things stand, PERD↓ advocates might be tempted to align with standard perdurantist accounts and save HS. PERD↓ may achieve this aim by rejecting that metaphysical priority entails necessitation, and hence denying that the priority of wholes over their parts entails that facts (or properties) of the wholes necessitate facts (or properties) of the parts. What follows is a view in which perdurant wholes are more fundamental than their temporal parts, but still the properties of the temporal parts are more fundamental of the properties of the perdurant wholes, as represented below.



However, this is not a good defense of HS, as it rests upon an *ad hoc* rejection of the seemingly reasonable connection between metaphysical priority and necessitation. Moreover, by denying that metaphysical priority of wholes over temporal parts entails that facts about perdurants necessitate facts about temporal parts, it does not follow that the direction of necessitation is the reverse one (namely the necessitation of temporal parts' facts over perdurants's facts), and hence it is not sufficient to save HS. Giving up the idea that priority entails necessitation, PERD↓ might have, in fact, no commitment on the priority relations between properties of parts and properties of the wholes.

Another possible way to save HS while endorsing a PERD↓ is to deny that HS applies to mereology, and then to the relation between (temporal) parts and (perdurant) wholes. The idea would be that HS, by defending that there is nothing in the world except the spatio-temporal distribution of local natural properties, is a principle in defense of physicalism, rather than a principle about the dependence of facts about composite entities on facts about their parts. Thus, it would not be in contrast with PERD↓, which takes perdurant wholes as more fundamental than temporal parts. I do not find this solution convincing either, for I see no reasons to deny that HS concerns mereology, and hence the relation between properties of (temporal) parts and properties of (perdurant)

⁴⁵ I am indebted to Giuliano Torrenco for suggesting this case in discussion.

wholes. Take again the case of temperature, in which the relation between the temperature of an object *O* and the kinetic energy of the particles composing it is a case in which HS concerns parts and wholes. We need thus a better story to reject HS for mereological cases, a story that I do not have.

Finally, one may bite the bullet and defend the compatibility of HS with PERD↓, although accepting both the relation between fundamentality and necessitation, and the application of HS to mereology. One may argue, for instance, that the priority of perdurant wholes over temporal parts maintained by PERD↓ does entail SUB, but that SUB is consistent with HS. It follows a form of PERD↓ in which a harmonic dependence of facts about composite entities and facts about particles obtains.



Although a view of this kind cannot be discarded as untenable, the emerging mutual dependence comes with a cost, for it is in contrast with the asymmetry of the relation of fundamentality (see section 2.3.2. above). And although dependence per se may also be symmetric⁴⁶, an asymmetric relation appears preferable if we want to consider dependence in terms of metaphysical explanations⁴⁷.

Setting aside attempts to make HS compatible with PERD↓, I see several reasons to think that giving up HS does not raise any fatal problem for PERD↓. First of all, PERD↓ is not the only perdurantist approach which denies HS. HS has been rejected by other perdurantists too - see (Armstrong 1980) and (Robinson 1989) - who argued that some facts about persisting objects (e.g. the causal relations between earlier and later parts) cannot be reduced to facts about their briefest temporal parts. The rotating disc problem, for instance, is a famous argument against the doctrine of HS (see section 1.3.1. above).⁴⁸ These disputes are particularly interesting for they constitute a precedent to the denial of HS entailed by PERD↓.

A further reason not to regret the denial of HS comes from modern physics⁴⁹, and in particular from the arguments of quantum mechanics from entangled states, which

⁴⁶ Take for instance the cases of mutual (or reciprocal) dependence – see (Simons 1987, 322).

⁴⁷ Against symmetrical dependence, see (Lowe 2012a), who defends asymmetrical dependence in individuation against ‘structuralist’ ontologies.

⁴⁸ Although more sympathetic towards a stage theory rather than towards perdurantism, see also (Hawley 2001, sec. 3.5.), that in response to the homogeneous disc argument defends the existence of non-supervenient relations between stages, i.e. relations that are not determined by the intrinsic properties of those stages.

⁴⁹ See (Loewer 1996, 179) and (Maudlin 2007, chap. 2). On entangled states and relational holism, see also (Morganti 2009).

suggest that HS is not true. Roughly, the idea is that quantum systems composed by two quarks with opposite spins (up and down) and in two space-like separated regions (so that no physical signal can connect them, and hence there is no causal relation among them), clash with HS, since facts concerning the parts of the system supervene on facts of the system itself. If this is correct, and if it is likely to prefer metaphysical theories which are compatible with our best scientific theories, then the rejection of HS may end up being an advantage rather than a problem of PERD↓.

Besides the arguments from scientific theories, PERD↓'s denial of HS may also find support in some views on personal well-being,⁵⁰ and in particular on the views that lifetime well-being (LW) – i.e. the well-being of the whole life of a person - is more fundamental (or explanatorily prior) than momentary well-being (MW). Call this view 'lifetime prior', opposed to the mainstream 'moment prior', according to which MW is more fundamental than LW. Along with the priority of MW, moment prior usually goes with two other theses, namely internalism (i.e. any MW at t is fully determined by what happens at t) and additivism (i.e. LW is the sum of the MWs).⁵¹ Although it may account for cases like the so-called "James Dean Effect" (according to which a wonderful life that ends abruptly is judged to be better than one with additional moderately pleasant years)⁵², there is another intuition that a moment prior additive internalism does not appear able to account, namely the "Shape-of-Life" (SOL) Intuition - cf. (Slote 1983; Velleman 1991). Consider two lifetime well-beings, LW_1 and LW_2 , such that i) LW_1 and LW_2 are the sum of the same momentary well-beings ($MW_1, MW_2, MW_3...MW_{10}$), and ii) the order of the momentary well-beings composing LW_2 is the reverse of the order of the well beings composing LW_1 (so that LW_1 is composed by MW_1 at t_1 , MW_2 at t_2 , etc., whereas LW_2 is composed by MW_{10} at t_1 , MW_9 at t_2 , etc.). Suppose also that the well-beings are increasing with the number, so that MW_1 is the lowest well-being of the set, and MW_{10} is the highest one. Given moment prior internalism, LW_1 should be the same as LW_2 : but this is against the strong intuition we have, namely that LW_1 ought to be preferred to LW_2 . If we assume that the SOL intuition is relevant and cannot be explained away, moment prior additive internalism faces a dilemma, which may be solved by denying the priority of MW over LW⁵³. An instance of lifetime prior is the view called "life time prior life-satisfactionism" (LPLS), which claims that "LW is determined by (hypothetical) global life-satisfaction at the end of one's life" (Miyazono 2018). It follows that MW is determined by LW, in virtue of its contribution to LW, and not vice-versa. Applying the distinction between LW and MW within a perdurantist framework, LW may

⁵⁰ For an introduction to the philosophy of well-being, see (Fletcher 2016).

⁵¹ See (Feldman 2004) and (Bradley 2009).

⁵² Cf. (Diener, Wirtz, and Oishi 2001).

⁵³ Alternative options that I am not going to discuss here are i) the denial of internalism, by saying that MW is influenced by SOL (cf. (Feldman 2004; Kauppinen 2015)), and ii) the denial of additivism, by arguing that SOL influences MW's contribution to LW (cf. (Velleman 1991)).

result as the well-being of the perdurant whole, whereas MWs are the well-beings of the temporal parts composing the perdurant. As things stand, LPLS provides us with a case in which some states of the whole are more fundamental than the states of its temporal parts. Being in contrast with HS, it offers an indirect argument in support of PERD \downarrow (or more in general, in favor of a perdurantist approach which is not committed to HS).

2.5. Some advantages of Top-Down Perdurantism

In what follows I will consider some advantages of PERD \downarrow , namely the fact that it offers an account of the distinction between integral wholes and mere fusions (§ 2.5.1.), that it does not give up the idea of persistence as a form of identity (§ 2.5.2.), that it avoids personal persistence as sortal-dependence (§ 2.5.3.), and that it offers a metaphysical ground to some recent accounts of the unity of consciousness (§ 2.5.4.).

2.5.1. Integral wholes and mere fusions

PERD \downarrow is the view that perdurant wholes (and in particular perdurant persons) are more fundamental than their temporal parts. Setting aside persons, one may wonder whether given PERD \downarrow *all perdurant wholes* are more fundamental than their temporal parts. To answer this question, we begin by introducing a pre-theoretical, intuitive distinction between two kinds of perdurant wholes, namely the “integral (perdurant) wholes” (such as tables, cats and persons) and the “mere (perdurant) fusions” (such as the fusion of my left half body yesterday, and the Empire State Building today). Hereafter, I will use ‘perdurant wholes’ - or ‘wholes’ - to indicate nothing but the integral perdurant wholes, distinguished by the mere perdurant fusions. Considering mere fusions like the gerrymandered and arbitrary sum of my left half body yesterday, and the Empire State Building today, parts seem to be reasonably more fundamental than the sum they compose, rather than vice versa. How is that compatible with PERD \downarrow , which takes temporal parts as derivative from perdurant wholes?

Three solutions are available: either i) PERD \downarrow is false; or ii) mere perdurant fusions are more fundamental than their parts appearances notwithstanding; or iii) only integral wholes are more fundamental than their parts, and if so, PERD \downarrow must include a principled way to distinguish integral wholes and mere fusions. Defending both PERD \downarrow as well as the intuition that temporal parts have priority over mere diachronic fusions, I shall argue for iii), namely that PERD \downarrow offers an account of the distinction between integral wholes and the mere fusions, based on priority relations between temporal parts and perdurant wholes. I shall argue this constitutes an advantage for PERD \downarrow , focusing on a different way it may be committed to mereological essentialism.

In section 1.7. I introduced the principle of mereological essentialism, focusing on its relation with perdurantism, and the way it can be spelled out. I argued, that although a mereological essentialism about temporal parts (ME-TP) is not a necessary condition for perdurantism, this principle is usually accepted by perdurantists. One reason to accept ME-TP is that by denying this principle, a distinction among temporal parts seems to follow, according to which only some temporal parts are necessary for the whole to persist, whereas others can be lost without compromising the identity of the perdurant. ME-TP appears thus preferable than a commitment to a distinction between primary and secondary temporal parts (which is based in turn on the distinction between the material whole and the whole *secundum formam*). Setting aside the distinction between primary and secondary temporal parts, the commitment to ME-TP turns out to be necessary if we consider temporal parts to be more fundamental than the perdurant they compose. Let us now wonder what happens if we accept PERD↓.

If perdurant wholes are more fundamental than their temporal parts, it seems possible that given a certain perdurant *A* (composed by the temporal parts $a_1, a_2, a_3 \dots a_{10}$), it exists also if one of its temporal part (e.g. a_{10}) is removed or substituted by a different temporal part (e.g. a_{10}^*). If this is correct, perdurants end up being what (Chisholm 1976) called *entia per se*, which are entities that do not obey mereological essentialism, and which are opposed to the so called *entia per alio* - namely entities that do obey mereological essentialism and thus cannot change their parts and continue to exist.⁵⁴ As *entia per se* can change their parts and continue to exist, I argue that perdurants within PERD↓ may continue to exist even if some of their temporal parts change, in virtue of the priority of perdurant wholes over their temporal parts.⁵⁵ Otherwise said, if the whole has priority over its parts, then it is possible to give up mereological essentialism. However, this is not the case of mere fusions of temporal parts: mere fusions of temporal parts are instances of *entia per alio*, which cannot undergo various kinds of mereological change ‘by

⁵⁴ On the distinction between *entia per se* and *entia per alio*, see also section 1.5.1, footnote 74. Along with Chisholm, the idea that mereological essentialism concerns some entities but not others has been defended by several endurantists - *inter alia* (Wiggins 1979, 1980), (Lowe 1989, chap. 6), (Baker 2000, chap. 7, 2007, chap. 9), (Elder 2003, 2004, chap. 3), and (Meirav 2003, 2009). For a discussion on the possibility of mereological sums to change their parts, see (van Inwagen 2006; Sanford 2011).

⁵⁵ It seems possible to argue, however, that this is not true for all kinds of PERD↓: take for instance the case in which temporal parts are mere abstractions from a temporally extended whole. In this case - which would be the case according to a top-down interpretation of CEM – it seems that the whole could not exist without these parts, and thus mereological essentialism still holds (thanks to Thomas Sattig for suggesting this option). Thus, one may conclude that mereological variability does not depend from the priority of the wholes over the parts, but rather from taking perdurants as integrated wholes. But if this is the case, then PERD↓ has no advantage over the other views. Although I bite the bullet on the fact that there are some cases of in which PERD↓ does not avoid mereological essentialism for perdurant wholes (such as in the case in which it is paired with CEM), I still think that there are cases in which PERD↓ can explain the differences between integral wholes and mere fusions. This is what I mean when I claim that “if the whole has priority over its parts, then it is possible to give up mereological essentialism”, even though it is not necessary.

definition’ – cf. (Cotnoir and Varzi forthcoming, 233). It follows that PERD \downarrow offers an account of perdurants as *entia per se*, which are not committed to mereological essentialism; but this does not seem to be true for all kinds of collections of temporal parts. This does not seem to be true, for instance, for the sum of my left half body yesterday and the Empire State Building today, for the whole would change if one or more of its temporal parts change. And this is consequence of the fact that such a whole is not more fundamental than its temporal parts. As things stand, PERD \downarrow as the view that perdurant wholes are more fundamental than their temporal parts should be properly understood as the view that *integral perdurant wholes (but not mere sums) are more fundamental than their temporal parts*. PERD \downarrow is thus able to explain the distinction among integral wholes and mere sums of temporal parts, in virtue on the different priority relations connecting those wholes to their temporal parts, and where the evidence of this distinction is the different commitment to mereological essentialism. Ontological priority and epistemic priority take then opposite directions. On the one hand the priority of integral perdurant wholes grounds the fact that mereological essentialism does not hold for those perdurants, while on the other hand the fact that mereological essentialism does not hold for some perdurants is evidence of the fact that they are more fundamental than their temporal parts (and hence they are not mere fusions of temporal parts).

Besides the fact that PERD \downarrow can account for the difference between integral wholes and mere fusions of temporal parts, a further interesting aspect concerns the status of integral wholes as *entia per se*. As a matter of fact, this is not the way perdurants have been conceived by standard PERD \uparrow : if temporal parts are more fundamental than the wholes they compose, then these wholes will be more likely to be *entia per alio* rather than *entia per se*. As *entia per alio*, one may reasonably consider getting rid of them endorsing an eliminativist account and hence abandoning perdurantism in favor of a stage theoretic view. In contrast, the account of perdurant wholes as *entia per se* offered by PERD \downarrow may offer a defense against a stage theoretic deviation.

But what does it mean that according to PERD \downarrow perdurants are *entia per se*, namely entities which do not obey mereological essentialism? In section 1.6. above, I have argued that accepting an atemporal notion of parthood, the account of mereological essentialism within perdurantism gets rid of any temporal understanding of parts change in favor of a modal one. This means that mereological essentialism does not require any temporal constancy of the parts of the perdurant whole: rather, it concerns the fact that given a perdurant whole, any temporal part constituting it is essential for that perdurant to exist. Change just one of its parts and the whole perdurant changes: no transworld identity obtains if two perdurants are not constituted by exactly the same temporal

parts.⁵⁶ But if perdurant wholes are *entia per se*, which are not committed to mereological essentialism, perdurant wholes may have different temporal parts than the ones they have (whereas mere fusions of temporal parts cannot). And since persons are integral wholes, it follows that perdurant persons may have different temporal parts than the one they have. As things stand, explaining how things may have different temporal parts in different worlds, the priority of the perdurant wholes over temporal parts endorsed by PERD↓ is able to account for transworld identity of perdurant persons, whereas PERD↑ leads to a theory of counterparts.

Let me now consider two possible concerns that may follow the denial of mereological essentialism and the account of perdurant wholes as *entia per se*. First, one may wonder whether the denial of mereological essentialism for (integral) perdurant wholes advanced by PERD↓ leads to be committed to a different form of essentialism, namely to *holological essentialism*. According to holological essentialism, wholes are essential to their parts, so that, if *y* is part of *x*, then *y* is necessarily part of *x* (provided *y* exists). Otherwise said, if *y* is part of *x*, the existence of *x* is necessary for the existence of *y*, i.e. *y* is part of *x* in every world in which *y* exists – cf. (Cotnoir and Varzi forthcoming, para. 6.2.). Take for instance my body and my hand, and suppose that my hand is removed from my body: according to holological essentialism, my hand exists as far as it is part of my body, whereas it stops to exist as soon as it is no more part of my body. Applied to perdurant wholes and their temporal parts (and a fortiori to persons), holological essentialism is the doctrine that, given a perdurant *P* and its temporal parts *p*₁, *p*₂, *p*₃, then *p*₁, *p*₂, *p*₃ are parts of *P* in every world in which they exist. This means that, although it is possible for a perdurant to have different temporal parts than the ones that it has, none of the temporal parts of the whole may exist if that perdurant does not exist. Suppose for the sake of the argument that PERD↓ does entail holological essentialism (although I do not exclude there may well be other considerations on this issue). Now, a possible worrisome consequence of such an entailment is that it would lead to a sort of denial of the doctrine of arbitrary undetached parts – or better, to the denial of the doctrine of arbitrary *undetached temporal parts*. According to the doctrine of arbitrary undetached parts – firstly discussed and rejected by (van Inwagen 1981) – in addition to ordinary objects, such as the table in front of us, or the Empire State Building, the world includes also any arbitrary section of those objects, such as the board of the table, the northern half of the

⁵⁶ Some may find this discussion of mereological essentialism a bit odd, given the fact that most perdurantists – and among them Lewis and Sider – are not transworld identity theorists. Accepting a counterpart theory, they would rather say that fusions of temporal parts in the actual world have their parts essentially in the following sense: *qua fusions*, they have no fusions-counterparts that are composed of different parts; whereas *qua persons* (say) they have person-counterparts which are composed of different parts. Then, the right thing to say in this case is that some objects in the actual world have person-counterparts which are composed of different parts, but no fusion-counterparts which are composed of different parts. (Thanks to Kristie Miller for pointing that out to me).

Empire State Building, etc.⁵⁷ Whether a commitment to the denial of this doctrine is a cost for PERD \downarrow is a subtle issue. On the one hand, the doctrine is, at least implicitly, embraced by defenders of classical extensional mereology — as van Inwagen himself recognized (van Inwagen 1981, 123). On the other hand, van Inwagen’s arguments for its denial seems to be in line with the general spirit of PERD \downarrow ; thus the commitment may turn out one that the defender of PERD \downarrow may independently want to have. However, I do not need to address this issue, because I maintain that even if PERD \downarrow is committed to a form of holological essentialism, it does not follow that it is committed to the denial of the doctrine of undetached temporal parts. Holological essentialism and the denial of the doctrine of arbitrary undetached temporal parts are two logically independent theses. According to PERD \downarrow , temporal parts are less fundamental than the perdurant whole that they compose; given a plausible reading of the notion of fundamentality, their existence depends on the existence of the perdurant whole of which they are parts. And given a plausible notion of existential dependence, holological essentialism follows: if the (perdurant) whole didn’t exist, none of the temporal part that compose it would exist. The truth of this counterfactual claim does not touch upon the fact that PERD \downarrow is a form of perdurantism, according to which any actual whole has actual temporal parts. And, unless a defender of PERD \downarrow has independent reasons to maintain that, for instance, only instantaneous temporal parts, or only parts that extend for one minute exist, PERD \downarrow is compatible with the existence of temporal parts of any arbitrary temporal shape (that is length). Therefore, given that the Empire State Building exists and persists, the temporal part of the Empire State Building that is extended from May 1 1931, at 15:31 until March 19 2015 at midnight exists. As things stand, I do not think that the commitment to holological essentialism constitutes any mortal threat for PERD \downarrow . I leave to the reader (and to his metaphysical taste) to judge whether this is a too high cost for PERD \downarrow .

Another worry for PERD \downarrow , as a position which is not committed to mereological essentialism for perdurant wholes, may be the commitment to a distinction between primary and secondary temporal parts and hence to a distinction between the *material* perdurant and the perdurant *secundum formam*. Although this distinction may sound untenable for all materialist perdurantists (to say nothing of Lewis, who would be spinning in his grave), the advocates of a PERD \downarrow may bite the bullet on that. As a matter of fact, they may also argue that the distinction between perdurant wholes and mere sums of temporal parts rests upon the fact that the former but not the latter are perdurants *secundum formam*, and that it is in virtue of having a form that mereological

⁵⁷ For the enthusiast, the principle may be spelled out as follows.

DOCTRINE OF ARBITRARY UNDETACHED PARTS: Necessarily, for any material object x , and regions, r and r^* , if r is the region x exactly occupies, and if r^* is any exactly occupiable subregion of r , then there exists a material object y , such that (i) y exactly occupies r^* , and (ii) y is a part of x .

On undetached parts, see also (Wiggins 1968), (Carter 1983), (Heller 1990, 2–4), (Burke 1994b), and more recently (Varzi 2013).

essentialism can be denied (whereas it holds for mere sums like my left half body yesterday and the Empire State Building today)⁵⁸.

2.5.2. Saving “persistence as identity”

In section 1.8.2. I pointed out that, although persistence within perdurantism is a matter of unification rather than numerical identity of temporal parts, it does not follow that no identity is involved in perdurantism, for perdurants (and among them perdurant persons) do persist numerically identical to themselves over time. More specifically, given a perdurant person P , those temporal parts at t_1 and t_2 are respectively p_1 and p_2 , P at t_1 is numerically identical to P at t_2 , although p_1 and p_2 are distinct temporal parts. However, this does not seem the way perdurantism has been generally intended, the general idea being rather that there is no identity of perdurants at different times, if not in a very loose sense. The fact that temporal parts are unified into a whole is said to lead to a “too swift” formulation of identity of the whole⁵⁹, which rests upon the numerical distinction among temporal parts at different times. I argue that this is consequence of the commitment to a standard $\text{PERD}\uparrow$, whereas the priority of the whole defended by $\text{PERD}\downarrow$ helps explaining in what sense a perdurant person P at t_1 is numerically identical to P at t_2 , although its temporal parts at t_1 and at t_2 are not numerically identical.⁶⁰ But before doing that, I shall deal with a possible objection that goes back to Lewis, namely the rejection of the unification of questions about persistence and questions about identity. According to Lewis, persistence questions are not questions about identity at all (Lewis 1986a): questions of persistence concerns the temporal extension of material objects, namely how material objects get to exist at different moments. This way, identity drops out of this formulation of the persistence question. And if identity does not count for persistence, the considerations below in defense of $\text{PERD}\downarrow$ would be pointless. However, as I argued in chapter 1, through my work I defend an identity-loaded account of

⁵⁸ I cannot deny that this will have a cost, which is the cost of giving up classical extensional mereology in favor of some different mereology – see for instance the Aristotelian slot mereologies recently developed in (Sattig manuscript), and before that the account of ordinary objects defended in (Sattig 2015), where entities are described as having “double lives” in virtue of their being compounds of matter and form. I prefer not to take a definite stand on this issue, since whether the cost to be paid is worth the prize depends on several issues which go outside the scope of my research.

⁵⁹ See for instance (K. Miller 2010, 574): “I am sympathetic to the claim that the person should be identified with the four-dimensionally extended object, not with any of the person-stages. So the four-dimensionalist is right to point out that she has in her ontology an object that is, in some good sense, numerically identical across time, and the existence of that object clearly grounds a good deal of our talk about persons. I do, however, think that this four-dimensionalist response is altogether too swift.”

⁶⁰ The situation is different as far as $\text{PERD}\leftrightarrow$ is concerned, since (at least some of) its advocates appear inclined to accept the identity of the perdurant at different times (I am grateful to Achille Varzi, who confirmed that in private conversation – October 2017, Columbia University).

persistence, which is in line with our ordinary intuition about persistence as existing at different times.

As a matter of fact, given $\text{PERD}\uparrow$, the existence of perdurants, and hence their identity at different times, rests upon the unification of numerically distinct entities, which are more fundamental than the wholes they compose. Otherwise said, the priority of temporal parts over perdurant wholes defended by $\text{PERD}\uparrow$ accounts for nothing but a sort of derivative identity of P, which is based on the fact that distinguished entities (i.e. temporal parts) compose a further single entity (i.e. the perdurant person). It is not surprising, then, that the identity of P at t_1 and P at t_2 has been understood as nothing but a loose way to use the notion of identity. Although justified by practice, P at t_1 and P at t_2 are properly two different things, being identical only in a “loose and popular sense”, but not in a “strict and philosophical one”. The situation changes as soon as we turn our attention to $\text{PERD}\downarrow$, the perdurant P at t_1 being identical to the perdurant P at t_2 in a strict and philosophical sense. Since according to $\text{PERD}\downarrow$ perdurant wholes are more fundamental than the temporal parts composing them, the identity of such perdurants does not reduce to a unity relation among independently existing temporal parts. On the opposite, it is *the distinction among temporal parts of perdurant wholes which is derivative*: if the existence of the perdurant whole is more fundamental than the existence of its temporal parts, then it is the difference between the temporal parts of P at t_1 and P at t_2 , namely p_1 and p_2 , which is derivative.

As things stand, one may wonder whether an opposite problem arises for $\text{PERD}\downarrow$, which concerns the status of the numerical distinction of temporal parts constituting the same perdurant whole. The worry goes as follows: if the distinctness of temporal parts of the same perdurant is derivative, does it mean that according to $\text{PERD}\downarrow$ temporal parts are distinct (i.e. non-identical) just in a “loose and popular” way? I will argue this is not the case. The reason is that according to $\text{PERD}\downarrow$ each temporal part p_1, p_2, \dots, p_n composing a perdurant whole is an individual, and although the fact that each is distinct from any other is a derivative fact, it does not follow that *strictly speaking* $p_1 = p_2 = \dots = p_n$. If we were to consider the distinctness of temporal parts merely as a loose and popular non-identity, the very existence of temporal parts would be in danger, driving $\text{PERD}\downarrow$ to the endurantists’ arms. (Quine’s “no entity without identity” is here declined in a way that account for the existence of pluralities: *no entities without non-identity*). If the (numerical) non-identity between temporal parts of the same perdurant, say p_1 and p_2 , were just “loose and popular”, then we could merely *talk* (in a loose and popular sense) of p_1 as distinct from p_2 , as in the case in which one entity is described in two different ways (for instance when we say “the man is not the artist” talking about the same person). If we apply this line of reasoning to a temporally extended perdurant P, $\text{PERD}\downarrow$ would turn out to be the view according to which we can loosely talk of P in different ways, by calling it $p_1, p_2 \dots p_n$ *as if* we were talking of numerically distinct entities, when in

fact we are just talking of P as existing at $t_1, t_2 \dots t_n$ — namely as it can be described in different ways, depending on temporal point of view we consider.

Provided that according to perdurantism things persist by having *more* than one temporal part (for if things are said to persist by having one temporal part, then endurantism and perdurantism collapse one into the other), this reading of PERD \downarrow would end up being a form of endurantism - and specifically of simplism⁶¹. However, there is no reason to think PERD \downarrow is committed to such consequences. As PERD \downarrow claims that the temporal parts exist, although they ontologically depend on perdurant wholes, it claims that temporal parts are distinct in a strong and philosophical sense, although their distinction is derivative. To say that p_1 and p_2 's numerical distinctness is derivative does not mean that they are distinct just in a loose and popular sense, but that their multiplicity is the result of the metaphysical abstraction from a unified perdurant whole. I use "metaphysical abstraction" to underline that the existence of temporal parts is not just the result of an intellectual process, so that their ontological status cannot be compared to the status of those things we include in the world for practical reasons (like Chisholm's ordinary objects). As I argued extensively above (see sections 2.1. and 2.2.) the relation of dependence between perdurant wholes and temporal parts is a relation of priority which is not in contrast with the existence of both sides of this dependence. One may argue that this strategy may also be used by PERD \uparrow to defend the idea that perdurant wholes are identical in a strong and philosophical sense, so that the introduction of PERD \downarrow would not represent any significant advantage over PERD \uparrow . Still, I think that PERD \downarrow has the merit of showing in which sense perdurant wholes are strictly identical through time, rather than just in a "too swift" way, saving an account of persistence as identity.

A different strategy PERD \downarrow may consider accounting for a strong understanding of the distinction between temporal parts, while recognizing the priority of perdurant wholes, may lead back to Hegel, and in particular to his dynamic conception of the relation between the fundamental wholes (and among them the Absolute as The fundamental Whole) and their parts. [Note that this won't involve any careful exegesis of Hegel — the reader is free to think of these aspects of a formal definition as *Neo-Hegelian*.] Taking distances from those systems in which the relation between the fundamental whole(s) and its/their parts is static (like the Spinozian substance, the *Deus sive Natura* of its *Ethics*), Hegel inserts an essential dynamic element. It follows that although the Absolute in the Hegelian systems has a priority over its parts, it is just at the end that the Absolute (as a paradigmatic example of whole) obtains. As the Absolute identifies with a

⁶¹ As presented in section 1.4. above (and in particular in footnote 67), simplism is the view that things are extended over time, but they do not have temporal parts: persisting things are extended simples. Being extended over time, things are unilocalized rather than multilocalized (on unilocalizationism/multilocalizationism, see section 1.4. above). Thus, I think that this reading of PERD \downarrow is more in line with simplism rather than endurantism in general, this latter being usually paired with multilocalizationism.

“spiritual subject in becoming” (rather than a substance), of which everything in the world is a moment (or step) of its realization, I argue that PERD \downarrow may use a similar strategy to conceive temporal parts as moments (or step) of the realization of perdurant wholes. As reality is a process of self-production which obtains just at the end, perdurants may be thought as entities that reveal only in virtue of the different temporal parts at different times constituting them. If so, the numerical distinction of temporal parts at different times may result viable even within PERD \downarrow , and compatible with the numerical identity of the perdurant at different times. Let me notice that, as we learned from the history of thought, it is a short step from the Hegelian priority of the Absolute to the criticisms advanced by Feuerbach and Marx (see in particular Hegel’s account of God, as something that obtains “at the end, rather than at the beginning”); and the same may happen to PERD \downarrow , substituted by PERD \uparrow . In fact, if the necessity of temporal parts is understood in terms of dependence of the whole over its temporal parts, it is not clear what would distinguish PERD \downarrow from PERD \uparrow . I would have more to say in elucidation of this point: but that will suffice as a specification of the application of the Hegelian strategy to perdurants and temporal parts.

Still, one may wonder why a strict notion of identity for perdurants would be so important, and hence PERD \downarrow ought to be preferred in virtue of the fact that it can account for it. Defending strict numerical identity of perdurants is a way to vindicate a strong notion of *persistence as identity*, and hence to avoid a Parfitian account, according to which “identity does not matter for survival” (where survival is a synonym of persistence). Pace Parfit and his outstanding work on personal identity and persistence, I find the giving up of identity as a feature of persistence controversial. In fact, if identity is not involved in survival/persistence, we need a history to account for the self-concern one person-stage may have towards some person-stage rather than another. Advocates of PERD \uparrow may argue that the interest of our future selves or the complaints about our past rests upon the fact that our person-stages today are unified with some person-stages both in the past and in the future. And that such a unification obtains in virtue of some relation of similarity or gen-identity – cf. (Lewis 1971, 206–8). Setting aside the fact that similarity and gen-identity may not appear strong enough to justify our actions - such as our taking care of the stages which are more similar to our present-ones (the classical example concerns modality, e.g. the fact that we do not seem to care about our counterparts winning at the lottery or being unfairly imprisoned for a murder we never did) – another reason of defending persistence as identity is to offer to perdurantism an argument often advanced by endurantists. Endurantism has been often defended by arguing that it accounts for the intuition we have that to persist is to be numerically identical over time. When we say that a person persisted over time, let say from September 28th 1941, to October 14th 2001, we want to say that the same person existed at different times, at all times included from September, 28th 1941 to October, 14th 2001 (provided that this person has not gone in and out persistence within that interval). At

the end of the day, meeting our intuition and claiming a trump card which is usually on the endurantist hand, PERD \downarrow may hence have a significant advantage over its rivals.

2.5.3. Persistence and sortal-dependence

In this section I shall consider another advantage of PERD \downarrow , namely the fact that it avoids an account of persistence as sortal-dependent. In section 1.8. I introduced the Lewisian perdurantist account, and I explained how it takes any I-relation among temporal parts as resting upon some specific kind of similarity among those temporal parts. Provided that similarity and dissimilarity among temporal parts concern various aspects, the unification of temporal parts depends on the relative importances we give to some features of those parts, rather than to others (Lewis 1971, 206–8). The unification of temporal parts into ordinary objects is hence a unification *qua certain features* (rather than a unification simpliciter⁶²), which rests upon the *sense of a term* used to find similarities among temporal parts. This accounts for the fact that two temporal parts may be parts of the same person, but not parts of the same body (or vice versa), in virtue of the features selected by the term we are referring to ('person' on the one hand, 'body' on the other hand). As Lewis claims:

“Roughly, the idea is that the sense of a term somehow selects the counterpart relation that is to be used to find the counterparts of the thing denoted by that term. The terms ‘I’, ‘you’, ‘that person’, ‘the lady I saw you with last night’, ‘George’, all select the personal counterpart relation. ‘This thing’ (pointing at myself), ‘this body’, ‘my body’, ‘that which will be my corpse after I die’, all select the bodily counterpart relation. Similarly for indefinite terms (phrases of restricted quantification): ‘everybody’ selects the personal counterpart relation, whereas ‘every body’ select the bodily counterpart relation”. (Lewis 1971, 209)

As things stand, one might reasonably wonder what prevents a bottom-up perdurantist view like the one defended by Lewis to collapse into a *relative* (or *sortal*) *account of identity*, whose most famous advocate was Peter Geach – cf. (Geach 1967, 1973, 1980) . In a nutshell, according to Geach's theory of sortals, sentences of the form “a is identical to b” are necessarily meaningless, and they need to be completed with a

⁶² One may argue, on the contrary, that in Lewis' account, given two temporal parts a and b whatsoever, “a and b are the same thing” may be true simpliciter in virtue of mereological universalism. Since all stages are equally connected, and so are all person-stage connected, the fact that two stages are the same thing (or person) is true regardless of any system of reference (and it is necessarily true). I do not think this is a good reply, for it seems to make collapse universalism into a sort of monism (everything is identical to everything), and it does not seem to account for the fact that two stages can also be two things (i.e. when referring to stages themselves that are not numerically identical).

determinate *sortal F* to which sameness is referred. A sentence such as “a is identical to b” should hence necessarily take the form of “a is *the same F* as b” in order to be meaningful.⁶³ Lewisian relativization of the persistence to the sense of a determinate term seems then the application within a perdurantist framework of the Geachian theory of relative identity. What is relative in Lewis’s account is not, in fact, the identity of the temporal parts (since temporal parts at different times are numerically distinct), but rather the sort of connection among temporal parts we ought to consider, and hence the persistence of the four-dimensional entity. Although not all kinds of PERD \uparrow need to be committed to this relativization of persistence to sortals (as some marginal accounts show)⁶⁴, the standard (Lewisian) PERD \uparrow does.

But what happens if we conceive perdurantism in terms of PERD \downarrow ? I argue that Perd \downarrow is not committed to any sortal persistence, for the fact that two temporal parts are the same thing does not depend on any sortal defining their being unified or not. Given Perd \downarrow , two temporal parts being unified rests upon the fact that those parts are parts of a specific perdurant, which is more fundamental than those very parts. Applied to persons, two temporal parts are unified and let the same person persisting at different times if they exist in virtue of the same perdurant. However, one may argue that Perd \downarrow does not really get rid of sortal dependence, given the distinction introduced above between integral wholes and mere sums of temporal parts (section 2.5.1.), and the claim that the priority of wholes over temporal parts concerns the former but not the latter. As a matter of fact, there seems to be no easy way for Perd \downarrow to account for the distinction between integral wholes and mere sums without referring to sortals. The burden of the proof is on Perd \downarrow , so that its advantage over other kinds of perdurantism remains alleged, as far as it cannot provide us with a non-sortal principle for the distinction between integral wholes and mere sums.

Moreover, even denying that PERD \downarrow is committed to sortal persistence, one may reject that this constitutes an advantage of this version of perdurantism over the standard (Lewisian) PERD \uparrow . As a matter of fact, one may argue, persistence is not relativized to

⁶³ About Geach's theory of relative identity applied to personal persistence, see (Chisholm 1976, 94–95) and (Noonan 1980).

⁶⁴ Take for instance Quine, who aimed at distinguishing his theory identity as a matter of *identification in discourse context* – cf. (Quine 1950, 626) – from Geach’s account. “My point is strangely reminiscent of Geach's contention that "it makes no sense to judge whether x and y are 'the same' . . . unless we add or understand some general term-'the same F'" [...] I say "strangely" because I disagree with Geach; I insist that x and y are the same F if and only if x and y are the same, outright, and Fx. Cross-moment identification is another thing; the momentary objects x and y are unwaveringly distinct, but are time slices of perhaps the same F and different Gs” (Quine 1976, 860, fn. 2). According to Quine the identification “within the terms of a given discourse” does not imply any relative (or sortal) identity, but strict *identity for that discourse*; in other terms, even if identity seems to be necessarily relativized to the systems of reference, given a determinate system identity turns out to be “*absolute*” for that system, and not relative at all. I will go back to Quine’s “context-dependent perdurantism” in section 3.4.

sortals according to Lewis either, as persistence – unlike modality *de re* – does not involve temporal counterparts. Although sortals are relevant for picking out ordinary objects according to a standard (Lewisian) PERD \uparrow , persistence just consists in things having different temporal parts at different times, and hence it is not sortal-dependent. By contrast, persistence is sortal-dependent according to a temporal counterpart theory, where the truth-evaluation of persistence statements requires the specification of a respect of similarity, which is often achieved by specifying a sortal concept. As things stand, the denial of persistence as sortal-dependent would constitute an advantage of perdurantism over a temporal counterpart theory, rather than an advantage of PERD \downarrow over PERD \uparrow . (I am grateful to Thomas Sattig for pointing that out to me).

2.5.4. On the unity of consciousness

In his determined defense of four-dimensionalism (and implicitly of perdurantism), (Heller 1990) considered one important criticism advanced by Chisholm against an ontology of temporal parts applied to persons, which rests upon the analysis of our conscious nature – cf. (Chisholm 1971). In the section entitled *The Unity of Consciousness*, Heller claims as follows:

“One thing that makes people special as objects is that we are conscious. We can have experiences and we can be aware of ourselves having experiences. Furthermore, there is a unity to our consciousness. The independent experiences of hearing 'the', 'cat', 'is', and 'spotted' can sometimes go together to form a more elaborate experience. It is this unity of consciousness that suggests to Chisholm that people do not have temporal parts. He thinks that in order to have the more elaborate experience of hearing 'the cat is spotted', it must be the self-same thing having each of the parts of the experience. We could not account for the unity of consciousness if the object hearing 'the' were distinct from the one hearing 'cat', or if the one hearing 'th' were distinct from the one hearing 'e' and the one hearing 'c' were distinct from both the one hearing 'a' and the one hearing 't'. (I ask the reader to allow me the convenience of letting letters represent sounds.) The only way to account for the several short experiences going together to form the longer experience of hearing 'the cat is spotted', it seems, is to suppose that there is a single entity that is having all of the shorter experiences.” (p. 20)

Roughly, Chisholm’s idea is that in order to obtain, unity of consciousness requires a single entity (which is “wholly present at any times in which exists”, let me add) rather than a series of temporal parts. But according to Heller, Chisholm’s criticism does not constitute a threat for four-dimensionalism (or perdurantism) in general, concerning rather the specific kind of four-dimensionalism (or perdurantism) which takes parts as more fundamental than wholes, namely PERD \uparrow . As I pointed out above in section 2.1.,

Heller contrasts this view (which led endurantists like Chisholm to conceive any ontology of temporal parts tantamount with the idea that composite entities are derivative and hence removable from our ontology⁶⁵), by rejecting that temporal parts are more fundamental than the wholes they compose, and by defending what I called “flat-perdurantism”. In this section I shall argue that, along with PERD \leftrightarrow , Perd \downarrow can avoid Chisholm’s criticism too, offering a reasonable account of the unity of consciousness within a temporal parts ontology.

Let me now consider in detail the argument of the unity of consciousness advanced by Chisholm against temporal parts - and *a fortiori* against perdurantism. The puzzle consists in the (alleged) incompatibility of the fact that persons are constituted by a succession of instantaneous temporal parts endorsed by perdurantism and the fact that we are able to understand meanings of words and sentences like ‘Socrates’ and ‘Socrates is wise’, for the latter are extended through periods of time which surpass the temporal parts’ duration. As things stand, according to Chisholm, to understand the meaning of words and sentences, something needs to endure over time. But nothing endures over time according to perdurantism (per definition): words and sentences like ‘Socrates’ and ‘Socrates is wise’ are heard by a multiplicity of temporal parts – or more precisely, every temporal part would experience just one part of the words and sentences in question. But this is in contrast with our experience of the world, in which different parts of words/sentences heard at different times are unified into complex words/sentences, of which we can be aware. To get this point clear, consider the following example⁶⁶. Take the word ‘cocktails’: as soon as we hear this word, our imagination goes to fresh Mojitos, Martinis, Margaritas, and so on and so forth. However, if we are constituted by different temporal parts at different times, we also have to recognize that two distinguished temporal parts have the second-order experience of two words, namely ‘cock’ and ‘tails’. Setting aside further divisions of briefer temporal parts experiencing each letter composing these words, perdurantists need a story to account for the fact that when we can experience the word ‘cocktail’ in the way we do (provided we know what this word means), instead of the succession of “male chicken” and “end parts of animals”.

Like Heller, I think that Chisholm’s argument against perdurantism presupposes the commitment of perdurantist advocates to the priority of temporal parts over perdurant persons. I cannot deny this is the standard way perdurantism has been framed. Take for instance (K. Miller 2010), who claims that person-stages, rather than the four-dimensional objects, are “the locus of decision or action” and then the locus of experience⁶⁷. If

⁶⁵ To keep this section manageable, I will follow Chisholm, in considering PERD \uparrow and stage theory almost equivalent as far as conscious experience is concerned, although in section 2.1. above I explained the substantial differences among these two views.

⁶⁶ (Chisholm 1971) offers a similar example, considering the bird called ‘bobwhite’, which is another name to indicate the Virginia quail.

⁶⁷ “One and the same person can both like and dislike ice-cream, can both want and not want ice-cream, and can both reason about how to get, and avoiding getting, ice-cream. Of course, she has these different

temporal parts are more fundamental than perdurant persons, as PERD \uparrow claims, then it may be reasonable to say that temporal parts are what think, desire, experience. And if temporal parts are what think, desire, experience, some difficulties may arise in accounting for the unity of consciousness: how can instantaneous temporal parts be the right subjects of thought, if thinking/desiring/experiencing take time in order to obtain? To be sure, there may well be other considerations in favor of the idea that temporal parts are the subjects of thought, which are left unscathed by the considerations above. Advocates of the priority of temporal parts may appeal for instance to the fact that the case of unity of consciousness over time is nothing but a specific case of binding problem, which obtains also synchronically. By inquiring the way different aspects of consciousness are bound into a single experience at a time, one may find some interesting solution to employ also across time, such as the causal connections between temporal parts to explain the temporal extension of our thinking/desiring/experiencing. Or differently, one may argue that temporal parts are extended simples, or they are composed by further parts. Such views are not obviously incoherent and are notoriously hard to disprove, but of course this gives us no reason to take them seriously.

Let us rather consider what happens if we accept Perd \downarrow and recognize the priority of perdurant wholes over temporal parts. As above, it seems reasonable to think that if perdurant persons are more fundamental than their temporal parts, then perdurant persons are what think, desire, experience. Given Perd \downarrow , it follows that perdurant persons, which are extended over time, are what think, desire, and experience. This can provide us with an account of the unity of consciousness within a temporal parts ontology: any perdurant person is a single entity having a long unified experience, which is divided into a multiplicity of short experiences held by the multiplicity of its temporal parts. This may account for the fact that, even if we persist in virtue of having temporal parts at different times, we can have experience of words and sentences, which are essentially extended over time.

Moreover, I think that Chisholm's worry leads to a more general problem which may concern a theory of temporal parts, namely the puzzle of temporal experience: how can we have experiences of a continuous and temporally structured event if such experiences start with "a sequence of independent and static snapshots of the world at a time"? (Kelly 2005, 210)⁶⁸. This puzzle concerns the very possibility of temporal experience, and as

desires and reasons at different times, but she has them nonetheless. The point is that *we never find the entire four-dimensional object desiring, deliberating and acting*. For the entire four-dimensional object that is a person, is the sum of small entities each of which have different desires, and act in different ways to bring about those desires. *It is these smaller entities - person-stages - that deliberate about the desires of their local person-stages, and it is later person-stages that act to bring about those desires*. Persons, understood as entire four-dimensional entities, are simply not the right sort of thing to do any deliberating or acting. They are not the locus of decision or action." (K. Miller 2010, 575, my italics)

⁶⁸ (Phillips 2014, 141–42) gives a different characterization of the puzzle of temporal experience, in terms of how the flow of experience and the flow of what is experienced are related. I shall take no view on which

(Phillips 2014) points out, it is based on the so called “principle of simultaneous awareness” (PSA): to be experienced as unified, contents must be presented simultaneously to a single momentary awareness⁶⁹. This is not the place to demand an analysis of the puzzle of temporal experience, nor of the two non-skeptical solutions (memory theories and specious present theories) discussed in the literature. It is familiar enough to be invoked here without extensive commentary⁷⁰. What I want to do is rather to suggest that $\text{Perd}\downarrow$ may offer an interesting way to avoid the collapse of the extensional model of consciousness (according to which our streams of consciousness are composed of successions of extended ‘chunks’ of experience) into the cinematic one (according to which our streams of consciousness are composed of continuous successions of momentary states of consciousness), by claiming that the experiences of temporal structured events rest upon the priority of extended entities over the temporal parts composing them⁷¹.

In particular, defending the priority of perdurant wholes over their temporal parts and providing an (ontologically loaded) answer to the question concerning the unity of consciousness, $\text{Perd}\downarrow$ may offer a steady theoretical ground to those extensional models of consciousness according to which the stretches of experience have a metaphysical primacy over independent experiential units. Here is a representative sample of this view, endorsed for instance by (Soteriou 2007, 552–4) and then extensively by (Phillips 2011, 2014):

“When it comes to experience, it is significant stretches, not instants, that are explanatorily and metaphysically fundamental. In other words, the key claim required to make sense of temporal experience is not merely that experience is *extended* through time, but rather that there are certain durations of experience that are *explanatorily* or *metaphysically prior* to their temporal subparts. [...] this is how we must understand the extensionalist denial that “our consciousness is confined to an instant”. (Dainton 2008, 626). The extensionalist, as I have interpreted him, need not thereby deny that there are truths about instants. They can instead think of such truths as holding in virtue of what is true over a surrounding, and explanatorily fundamental, period. The most basic facts about our experiential lives are facts about extended stretches of the stream of consciousness, and what is true at an instant is true only in virtue of that instant being an instant during such a period of experience.” (Phillips 2014, 149–50).

of these versions of the puzzle of temporal experience is correct; when I refer to the puzzle of temporal experience, I refer only to one of these accounts.

⁶⁹ Cf. (I. Miller 1984, 109) and (Dainton 2017).

⁷⁰ For further reading see (Prichard 1950, 47–51), and (Dainton 2000, 2017) which offers a clear introduction and overview. Memory theorists include (Le Poidevin 2007, 92–99), whereas (Broad 1923; Tye 2003; Kiverstein 2010) advocate specious present theories.

⁷¹ On extensional models and related issues, see (Dainton 2017, sec. 5). Moreover, it is an interesting question whether and how $\text{Perd}\downarrow$ may account also the retentional models and the issues related to “content abundance” – cf. (Dainton 2017, sec. 6). Unfortunately, I cannot pursue this question here.

“The nature of experience over short timescales may simply be unspecifiable except by appeal to some longer stretch of experience of which the relevant sub-stretch is a sub-part. If that is right, then even if there are reasons to talk of diachronic co-consciousness, it must not obscure the metaphysical primacy of stretches as developed here.” (Phillips 2014, 155)

Thus, $\text{Perd}\downarrow$ may offer a reason to give up any special relation among independently specifiable experiential units, such as the largely disputed relation of diachronic co-consciousness introduced by Dainton to make sense of the unity of consciousness in his extensional model – see (Dainton 2000, 2008). So, beside the fact that it accounts for the unity of consciousness within an ontology of temporal parts, $\text{Perd}\downarrow$ may offer a metaphysical account in support of some models of temporal consciousness, and in particular to those extensional models that do not want to be committed to any special relation of co-consciousness.⁷² My primary interest in here is not so much in convincing anyone that extensional models of consciousness are especially appealing, as in showing the advantages of $\text{Perd}\downarrow$ for the advocates of those models.

In conclusion, I think that complete vindication of $\text{PERD}\downarrow$ is maybe not to be hoped for; every position has its drawbacks. But when all the arguments are in, I think the balance may favor $\text{PERD}\downarrow$. Of course, no objective measuring stick exists for these matters. For each argument my goal has been to assess the intellectual cost and benefit of maintaining this non-standard perdurantist approach. I leave to the reader the final choice.

⁷² Suppose that have good reasons to view temporally extended experiences/thoughts as explanatory prior to their momentary parts. Even in this case, a “bridge principle” seems to be needed to connect the top-down priority of mental states over their temporal parts and the top-down priority of perdurants subjects of mental states over their temporal parts. (I’m grateful to Thomas Sattig for pointing that out to me). This is a very interesting issue, and I think it can be a promising line of research for further work, in particular in relation with the phenomenal approach I shall defend in chapter 3.

CHAPTER 3. Moderate Perdurantisms

In section 1.8.1. I introduced Lewisian perdurantism as the standard perdurantist account, characterized by the commitment to the principle of unrestricted composition and then to universalism. I also presented the main argument for universalism, namely the argument of vagueness, which is supposed to show that if composition is restricted, then it is sometimes vague whether composition occurs. Applied to diachronic composition, this argument shows the difficulties of recognizing any cut-off with respect to when a composite comes into existence or ceases to exist, if not by introducing some conventional constraint (the meaning of a word in our linguistic practices, for instance). In section 1.9 I introduced some possible alternatives to the Lewisian perdurantist approach, that I labelled “moderate” or “restrictive” perdurantisms. Rejecting the principle of unrestricted composition without denying composition *tout court* (as it happens with nihilist approaches), a moderate perdurantist maintains that composition of temporal parts into perdurants occurs *only under certain circumstances*. In other words, a moderate perdurantism is a view which is not-liberal with respect to the diachronic composition of temporal parts (although they may be liberal with respect to synchronic composition). Its answer to the diachronic composition question (namely ‘given various times and various things existing at each, under what conditions is there something that at those times is composed of those things?’; cf. section 1.6. above) is ‘under such and such conditions’.

In this chapter I aim at elaborating some moderate accounts of personal persistence within a perdurantist framework, examining the advantages they have and the problems they need to deal with. I will spend particular attention on the way the argument of vagueness applies to such views, vagueness being the main problem with moderate answers to composition (both synchronically and diachronically). Again, let me point out that although I should deal with moderate perdurantism in general (given in particular the lack of any extended literature on this issue), my focus remains on persons and the way persons persist. This is important because arguing in favor of a moderate perdurantism for persons does not entail that moderate perdurantism is true for all material objects. On the contrary, moderate perdurantism about persons may be compatible with a universalist perdurantist about ordinary objects (or even a nihilist approach about their composition over time). I shall not discuss this at length, remaining rather neutral on this issue.

But why should one prefer a moderate kind of perdurantism? The answer to this question may be found in the two problems of the standard perdurantist view (see section 1.8.3.), and in particular on the dissatisfaction for a conventionalist account of

persons and personal persistence. Conventionalism about personal persistence (and more in general about the persistence of material objects) seems in fact the natural consequence of a standard (Lewisian) perdurantist approach, which is committed to unrestricted composition¹. If for every set of temporal parts there is an object composed by those temporal parts, then to recognize one perdurant rather than another as a person is nothing but the result of a conventional matter, and in particular the result of the way we use the term “person”. On the opposite side, moderate perdurantism can avoid a conventionalist account of personal persistence: if temporal parts compose a person only under certain conditions, the persistence question in terms of the diachronic composition question results metaphysically substantive. Moreover, a moderate perdurantism also has significant consequences on our ontology, for it is not committed to a multitude of temporarily-coincident four-dimensional entities and persons in our world. A sober ontology takes the place of Lewisian overpopulated landscape. This is what Heller has in mind when he argues that “the only way to avoid a fusion principle [i.e. a principle of unrestricted composition] would be to find natural constraints on objecthood that would allow for the existence of some objects while ruling out the existence of those purported objects that result from the fusion principle” (Heller 1990, 51).

Two points are worth consideration. The first one concerns the way Heller (indirectly) characterizes a non-liberal perdurantism, namely in terms of a perdurantism which is committed to the existence of some “natural constraints on objecthood”. Applied to perdurant entities, and among them to perdurant persons, these natural constraints may be thought as some joint-carving relations among temporal parts constituting perdurant entities, and hence perdurant persons. The existence of such relations among temporal parts would allow hence a perdurantist account to avoid the commitment to a principle of unrestricted composition, and then to the idea that persistence is a conventional matter. But what are such constraints? As I have anticipated above in section 1.9, I think it is possible to distinguish different forms of moderate perdurantism, on the basis of the specific constraints under which temporal parts compose a perdurant object (and given the focus of this work, a perdurant person). In particular, I suggested to distinguish them into two general kinds, that I called *brute moderate perdurantism* (or *brute perdurantism*) and *complex moderate perdurantism* (or *complex perdurantism*).

According to *brute perdurantism*, the diachronic composition question cannot be answered, for the constitution of a perdurant person by certain temporal parts is a brute fact, namely a fact which is not reducible to some more fundamental condition. As I am

¹ Along with Lewis conventionalism about four-dimensional objects has been defended also by other perdurantist advocates, like Heller. “It seems that any choice we make about this issue will have to be at least somewhat arbitrary; the world itself does not provide the natural unity that we hope for. Arbitrary selecting an object’s boundaries has the consequence that those boundaries are a function of our interests (or lack of interest, if the selection is completely arbitrary) and not of the object’s nature. If our ontology is of our interests, then it is a conventional ontology.” (Heller 1990, 50). On the conventionality of persons, see section 1.8.3. above, and in particular footnotes 122 and 123.

going to argue below (see section 3.1.), brute perdurantism applies to temporal parts (and hence to diachronic composition) the notion of brute composition defended by (Markosian 1998a), and it may be correctly understood as a form of anti-criterialism of personal identity within a perdurantist framework.

According to a *complex moderate perdurantism*, some temporal parts existing at various times constitute a perdurant person only under certain non-trivial circumstances – i.e. the diachronic composition of temporal parts occurs if and only if certain conditions are satisfied. In contrast to brute perdurantism, complex perdurantism takes composition as ontologically reducible to some more fundamental facts. It follows that there are as many complex perdurantist views as many (moderate and non-brute) answers to the (hard) diachronic composition question for persons: one may be that temporal parts are unified into a person iff they are connected by a causal relation (call it *nomological perdurantism*); another one may argue that various temporal parts constitute a person iff they are connected by a mental relation (call it *mentalist perdurantism*), and so on and so forth with more sophisticated versions. In sections 3.2.-3.3. I will focus on two kinds of complex perdurantism, namely nomological perdurantism (3.2.) and phenomenal perdurantism (3.3.). Although I do not exclude that other kinds of complex perdurantism may be available (such as of a form of organism perdurantism, in which the diachronic composition of temporal parts is restricted by sort of biological continuity), reasons of space force me to leave further inquiries on this issue for future work.

The second aspect of Heller's account of non-liberal perdurantisms concerns the idea that some kind of natural constraint of objecthood is necessary to avoid unrestricted composition. As a matter of fact, he claims that finding some joint-carving relation among parts would be "*the only way to avoid a fusion principle*" (my italics). In section 3.4. I will advance a counterexample to Heller's idea, arguing that there is a way to avoid conventionalism of persistence without being committed to the existence of constraints on objecthood which are carved out by nature. This leads to what I call "Quinean perdurantism".

3.1. Brute Perdurantism

3.1.1. A simple view for perdurantism

Brute perdurantism is the view that the composition of a perdurant entity by a set of temporal parts is just a brute fact, i.e. a fact which is not reducible to some more fundamental conditions of diachronic composition. According to brute perdurantism diachronic composition of temporal parts just obtains in a brute and primitive way. Let me define brute perdurantism as follows:

BRUTE PERDURANTISM: There is no true, non-trivial, and finitely long answer to the hard diachronic composition question (HDCQ) [namely ‘given various times and various temporal parts existing at each, under what conditions is there a minimal D-fusion of those things at those times?’ (see section 1.6. above)]

Applied to personal persistence, which is the topic of my work, brute perdurantism is the view that persons persist in virtue of having temporal parts at different times, but there is no specific condition under which those temporal parts are unified into a single perdurant *person*.

BRUTE PERDURANTISM OF PERSONAL PERSISTENCE: There is no true, non-trivial, and finitely long answer to the hard diachronic composition question for persons (HDCQP) [namely ‘given various times and various temporal parts existing at each, under what conditions is there a minimal D-fusion of those things at those times and this minimal D-fusion is a person?’]

Following (Sider 2001a, 122), it is reasonable to distinguish two versions of brute composition, and hence two versions of brute perdurantism. On the one hand there is a *strong brute composition* according to which composition does not supervene on causal or qualitative factors. It follows that two perfectly identical cases may be such that in one case composition occurs, but in the second one it does not. Composition of (temporal)parts is something over and above the causal and qualitative relations among temporal(parts) - something unnatural and even mysterious (if we are not friend of anything going beyond any causal and qualitative features). Call *strong brute perdurantism* the view that is committed to a strong brute composition. On the other hand, a *weak brute composition* accepts that composition supervenes on some further more fundamental facts, but it claims that there is no natural and finite restriction on composition. Call *weak brute perdurantism* the view which is committed to a weak brute composition. It may be disputable whether weak brute composition is properly a case of brute composition (being composition epistemically rather than ontologically unanalyzable), but I will not be investigating it further. In what follows I will just refer to strong brute composition when I will deal with brute perdurantism.

As far as I know, brute perdurantism has been completely ignored both by endurantists and perdurantists when dealing with persistence, and a fortiori when dealing with the persistence of persons. But why? Which is the reason of such an omission? A tentative answer may be that anti-criterialist (or simple) views about personal persistence have been traditionally considered in relation to endurantist accounts. Take for instance the famous defense of anti-criterialism advanced by (Merricks 1998), who carefully limits the denial of criteria of identity over time within the endurantist framework. According to Merricks, the fact that the criteria of persistence

for perdurantism reduce to the necessary and sufficient conditions of composition of temporal parts, provides perdurantist advocates with some more arguments in defense of criterialism, which are not available to endurantists². However, it does not follow from Merricks's account that an anti-criterialist perdurantism is not viable; what follows is rather that a simple view is more likely to be defended within an endurantist/three-dimensionalist framework.

To understand the legitimate position of brute perdurantism within the logical space of theories of persistence, let me analyze two different ways of framing an anti-criterialist approach (or simple-view) respectively within an endurantist and a perdurantist framework. On the one hand, the standard endurantist anti-criterialist approach to personal persistence claims that *identity facts are brute, primitive, and unanalyzable*: so, given P_1 at t_1 and P_2 at t_2 , according to an endurantist simple-view what is brute is the fact that P_1 is identical to P_2 . This is the way anti-criterialism has been presented in section 1.2. above. No informative, necessary and sufficient condition of identity over time results available according to endurantist anti-criterialism, the only necessary and sufficient conditions of identity being uninformative, such as 'being identical to the original', or 'instantiating the same essence', or 'being identical according to an omniscient being like God', etc.³. On the other hand, a perdurantist anti-criterialist approach to personal persistence (or brute perdurantism) claims that *diachronic composition facts are brute, primitive, and unanalyzable*. Given the temporal parts p_1 at t_1 , p_2 at t_2 , p_3 at t_3, \dots, p_n at t_n , according to a perdurantist simple-view what is brute is the fact that the temporal parts $p_1, p_2, p_3 \dots p_n$ compose a single perdurant person (whereas some other parts do not). Brute perdurantism is a form of anti-criterialism for the only necessary and sufficient conditions of composition are uninformative – i.e. such that presuppose the facts of composition of which they are conditions. Some instances of uninformative conditions of personal persistence within a perdurantist account are among others, the fact that 'they constitute the same perdurant person'; or that 'they rightly (or genuinely) compose a perdurant person', or that 'an omniscient being thinks that they compose a perdurant person'. Although obviously necessary and sufficient, these conditions of persistence are uninformative, and hence cannot provide us with any explanation of what constitute the persistence of perdurant persons.

² "The four-dimensionalist, however, may have more room to maneuver here. For she can say that identity over time just is a relation – a relation other than identity – relating one temporal part existing at one time to another, distinct, temporal part existing at another time. So criteria of identity over time can, for the four-dimensionalist, be characterized as necessary and sufficient conditions for, or even an analysis of, a composition relation, tying temporal parts together so that they compose four-dimensional wholes; this, in turn, gives the four-dimensionalist reasons for endorsing criterialism that are not available to the endurantist." (Merricks 1998, 122 fn. 10).

³ I borrowed some of these cases of uninformative conditions of persistence within an endurantist framework from (Merricks 1998, 107).

Let me point out that like its endurantist counterpart, brute perdurantism does not exclude the existence of epistemic conditions of persistence (that within a perdurantist framework are epistemic conditions of diachronic composition of temporal parts). This means that even according to brute perdurantism we may have some evidence for ordinary judgments about persistence: for instance, spatiotemporal continuity of material objects may be a good evidence to claim for persistence, so that we may reasonably argue that the person reading this section is the person that was reading the previous one ten minutes ago – or more precisely that the person-temporal part reading this section and the person-temporal part reading the previous one ten minutes ago compose one and the same perdurant person. Rejecting that the existence of some evidence for persistence entails the existence of some constitutive conditions of persistence, brute perdurantism may accept the former while denying the latter. To accept the existence of some strong evidence of diachronic compositions (and hence of some strong evidence of persistence), one may just add to brute perdurantism a supervenience thesis, according to which non-mereological facts supervene on (diachronic) mereological facts. Since it is not necessary for brute perdurantism to accept such a thesis, two forms of brute perdurantism should be actually distinguished: one accepting the supervenience of non-mereological facts upon (diachronic) mereological facts, and one denying such a supervenience. In this case, it seems reasonable to think that the first one, but not the second, is compatible with taking strong evidence of persistence, in terms of some informative non-mereological facts which supervene on mereological ones.

3.1.2. Markosian on brute composition

Although the idea of a brute perdurantism has not been widely discussed (if discussed at all), we can attempt to shed some light on this form of moderate perdurantism by examining brute composition in general. I will start by considering the way brute composition has been discussed within the mereological debate in its synchronic form and applied to material object in general, and hence I will wonder whether any insights may be used when dealing with diachronic composition of temporal parts of persons as well.

Brute (or “brutal”) composition has been advanced by (Markosian 1998a), who unsatisfied by the three standard solutions on the market – i.e. nihilism (“composition never occurs, so that there are no objects with proper parts”), universalism (“composition always occurs”), and van Inwagen’s proposed view (“composition occurs wherever there is a life, so that all and only composite objects are living entities”) – aimed at giving a new answer to the special composition question which is “consistent with standard, pre-philosophical intuitions about the universe’s composite objects” (p. 211). More

specifically, Markosian's brutal composition is supposed to differ from nihilism for it recognizes the existence of objects like chairs, cats, persons, etc. (provided that chairs, cats and persons are composite objects, rather than simples); it would differ from universalism for it is not necessarily committed to the existence of gerrymandered entities like the sum of my right hand and the Empire State Building; and it is said to differ from van Inwagen's view for it accounts for the existence of inanimate composite objects too – like chairs, buildings, and stars. Markosian defines brutal composition as follows:

[...] "Brutal Composition," is, roughly, the view that there is no true and interesting answer to SCQ [special composition question]. Whenever composition occurs, on this view, it is just a "brute fact" that the relevant objects compose something, and whenever composition fails to occur, this too is just a "brute fact." Here is a first formulation of Brutal Composition. [...]

Brutal Composition (BC): There is no true, nontrivial, and finitely long answer to SCQ." (Markosian 1998a, 214)

Brutal composition provides us with no informative necessary and sufficient conditions of composition, for the only necessary and sufficient conditions of composition are trivial (i.e. they are synonymous with the composition fact that there is an object composed of those parts)⁴. Whenever composition occurs, it occurs in a primitive way; it is a brute fact that some parts compose an object, whereas others do not.⁵

Markosian's defense of brutal composition is made up of two parts. The first one consists in the rejection of the charge of immediate counter-intuitiveness of brutal composition, which is based on the fact that the special composition question appears a so natural question, that providing it with a positive answer seems absolutely reasonable. To achieve his aim, he distinguishes brutal composition from a stronger (and in fact less plausible) thesis, that he calls "Non-supervenience of Composition", according to which "the set {composition} does not supervene globally on any set of non-mereological universals" (Markosian 1998a, 216). Then, he argues that brutal composition is not committed to the thesis of Non-supervenience of Composition, for advocates of brutal

⁴ I refer here to Markosian's characterization of uninformativity, which is less stringent than the one advanced by (van Inwagen 1990b, 30–31), according to which in order to be informative, an answer to the special composition question should contain no mereological terms.

⁵ To be precise, (Markosian 1998a) distinguishes *Brutal Composition* ("*BC*): There is no true, non-trivial, and finitely long answer to SCQ", p. 214) from another thesis on brute facts of composition, that he calls *The Brutality of Compositional Facts* ("*BCF*): For any xs, if there is an object composed of the xs, then it is a brute fact that there is an object composed of the xs" p. 215). Although he claims that BC's advocates ought to endorse BCF, "for it seems to me most likely that compositional facts are brutal, if there is no true, nontrivial, and finitely long answer to SCQ; and it also seems to me that there can be no such answer to SCQ, if compositional facts are indeed brutal" (p. 215), Markosian does not exclude the possibility of accepting BC but not BCF (for instance in the case of infinite series response, cf. pp. 230ff). For our purposes, however, this distinction between BC and BCF will not matter, so that I will just refer to brute (or brutal) composition to refer to both.

composition may accept that that two worlds identical with respect to all non-mereological features are also identical with respect to all composition features. This is because brutal composition – which claims that composition is a brute fact, and hence that there is no true, nontrivial, and finitely long answer to the special composition question – is consistent with the idea that two worlds which are duplicate in their non-mereological universals do not differ with respect to composition either. Along with the distinction between brutal composition and non-supervenience of composition, Markosian defends the plausibility of brutal composition by referring to Van Inwagen’s “Doctrine of the Mereological Circle”. According to this doctrine, introduced by Van Inwagen when discussing the General Composition Question - (van Inwagen 1990b, 51), mereological concepts are not capable of analysis in non-mereological terms (or remaining within the metaphor, in terms outside of the mereological circle). Although the doctrine of the mereological circle does not force to brutal composition, as (Markosian 1998a, 218) recognizes, it leaves nonetheless open the question concerning the relation between concepts of composition and non-mereological concepts. As a matter of fact, if van Inwagen is right in saying that concepts in the mereological circle cannot be analyzed in non-mereological terms, there is no reason to think that there are any interesting and necessary true principles linking composition concepts to non-mereological concepts. Brutal composition remains then viable, and not counter-intuitive as some may want to argue.

Second, (Markosian 1998a, 219–33) introduces the so called “argument by elimination”, which consists in an indirect defense of brutal composition through the denial of the most plausible alternative answers to the special composition question (i.e. nihilism, van Inwagen’s proposed answer, universalism, “fastenation” [according to which some *x*s compose an object iff those *x*s are fastened together], and then the “Series-styles answer” [according to which there are different kinds of composition relations for different kinds of objects, so that whenever some objects *x*s of a certain kind *K* stand in that relation to one another, then there is an object composed of those *x*s]). The argument is thus supposed to provide a default defense of BC based on the unacceptability of the alternative accounts of composition. This is not the place to demand a detailed analysis of Markosian’s arguments against these views. It will suffice to point out that his general strategy against the alternative accounts consists in showing their counter-intuitiveness: the counter-intuitiveness of the elimination of all composite objects given nihilism; the counter-intuitiveness of the elimination of all non-living composite objects given van Inwagen’s proposed answer; the counter-intuitiveness of accepting objects composed, for instance, by two paralyzed handshakers⁶ given fastenation; the counter-intuitiveness of universalist’s commitment to “far more

⁶ (van Inwagen 1987, 28ff) introduces and discusses the “handshake generation” case, when dealing with the contact/fastening/cohesion answers to the special composition question.

composite objects than common sense intuitions can allow” (p. 228); and finally the counter-intuitiveness of series-styles answer, that as any moderate answers to special composition question, is committed to a genuine vagueness in the world. As things stand, rejecting nihilism, universalism, and any moderate answer to the special composition question, and arguing that if nihilism, universalism and any moderate answer are false, then brutal composition is true, Markosian conclude that brutal composition is true.

Now, let us wonder whether the same arguments may be used to support brute perdurantism. As far as the charge of counter-intuitiveness of brute composition is concerned, I guess that it does. In particular, I think that neither brute perdurantism is committed to the stronger thesis of non-supervenience of composition, according to which two worlds which are identical with respect to all non-mereological features may differ with respect to some mereological features. As a matter of fact, the claim that the composition of a perdurant (and then a perdurant person) is primitive and not unanalyzable, is consistent with the supervenience of composition - and hence with the idea that identity of non-mereological features entails the identity in composition facts. Although this does not exclude that brute composition can be paired with non-supervenience of composition, it gives us no reason to take such a disputable thesis as a necessary consequence of brute perdurantism. And this may be enough for brute perdurantism to avoid the charge of counter-intuitiveness. In a similar way, brute perdurantism may appeal to the “Doctrine of Mereological Circle” to justify the fact that there is no constitutive condition of temporal part’s composition into a perdurant person, and then no answer to the diachronic composition question for persons. Rather than proving brute perdurantism, this argument has the less ambitious aim of justifying the reasonability of a brute perdurantism, which is not taken for granted at all, given the marginal position of this account in the persistence debate.

The argument by elimination applied to brute perdurantism offers some insightful remarks as well. It shows in fact the peculiar position of brute perdurantism in avoiding some disputable consequences of the other views, such as the denial of persons persisting over time (see nihilism about temporal parts, namely stage theory), the denial of non-living objects persisting over time (see van Inwagen’s proposed view applied to temporal parts), the commitment to an over populated world of perduring things (see Lewisian universalist perdurantism, and more in general any perdurantism committed to the principle of unrestricted composition), and finally the difficulties related to the argument of vagueness. In next section I will focus on these two latter.

3.1.3. Advantages of brute perdurantism and some objections

Brute perdurantism has two significant advantages: first, it avoids the problems of a standard (Lewisian) perdurantist account of personal persistence, and second, it avoids

the argument of vagueness, which is supposed to be fatal for all non-extreme perdurantist positions⁷.

In section 1.8.3. I claimed that there are two problems which concern any universalist perdurantism, namely the problem of the many and the problem of conventionality. I shall argue that a brute perdurantism can avoid both of them. It is able to avoid the problem of the many because accepting a brute composition of temporal parts, brute perdurantism is not committed to the claim that all sets of objects are such that they compose some entities. This does not mean that brute perdurantism is inconsistent with an overpopulated world, in which every set of objects is such that the members of that set compose something. Brute perdurantism can be in fact paired with some principle that leads to a sort of unrestricted composition of temporal parts. Rather, it means that a viable account for brute perdurantism is to say that only some of the relevant sets of temporal parts are such that their members actually compose perdurant entities (and in particular perdurant persons), namely the sets whose members compose the perdurant entities in question. Nor brute perdurantism needs to justify why some sets of temporal parts are relevant sets of temporal parts. It is just so, as Markosian points out when he claims that “when the BCer is asked why it is that the members of that set compose something while the members of the other relevant sets do not, he or she can just shrug and say, ‘There is no reason. It is a brute fact.’” (Markosian 1998, p. 242). Maintaining that composition is a brute fact, brute perdurantism is also able to avoid any charge of conventionality of personal persistence, which concerns instead the universalist account of perdurantism. If according to universalist perdurantism it is up to us saying which perdurant object among the plenitude of perdurant entities counts as a perdurant person, according to brute perdurantism perdurant persons are all and only the perdurant entities constituted by the relevant set of temporal parts. The persistence of persons through time is hence no conventional matter; and if persons and their persistence is something non-conventional, it follows that the kind of changes persons can undergo and still survive is not a conventional issue either. As things stand, questions concerning whether some fetus-temporal parts (or some corpse-temporal parts) are parts of a perdurant person result metaphysically substantial and not just solvable through a conceptual-linguistic analysis, as some advocates of a deflationist approach to personal persistence may want to argue.

Then, the second significant advantage of brute perdurantism is that it avoids the argument of vagueness, which constitutes a significant threat for any restricted account

⁷ Another advantage of brute composition (and then of brute perdurantism) is that it provides us with a solution to the paradox of undetached parts - see (Markosian 1998a, 242–43) on this issue; whereas for discussion on the paradox of undetached parts see (Wiggins 1968), (van Inwagen 1981), (Heller 1990, 2–4), and (Burke 1994b). However, I will not discuss it further, since this constitute no significant advantage for brute perdurantism, as the paradox can be solved by any perdurantist approach, being rather problematic within an endurantist framework.

of composition – and a key argument for Lewis’s universalist perdurantism (cf. section 1.8.1.). The idea is that accepting a brute diachronic composition of temporal parts, brute perdurantism may restrict composition to certain cases without facing any case of vagueness⁸. Brute perdurantism offers a principle of restricted composition that is not committed to cases of vagueness, being no further analyzable. As a matter of fact, the problem for any restricted account of composition consists in the lack of any sharp cut-off with respect to when a composite come into existence or ceases to exist such that, given two cases connected by a continuous series of cases extremely similar to the last, composition only occurs in one case but not in the other. A brute perdurantism recognizes such a cut-off, although it cannot analyze or explain it: composition occurs when compotion occurs, and there is no case in which it is (ontologically) vague. Thus, vagueness of personal persistence is neither ontological, nor linguistic (for it does not depend on the way we use the word ‘person’); rather, the only vagueness brute perdurantism may recognize, if any, is epistemic, and rests upon some limits of our knowledge in recognizing cases of genuine composition.

Let me now consider some possible objections against brute perdurantism.

Objection one: the *analysis argument*. It is reasonable to think that any successful analysis of a determinate issue consists in finding the informative, necessary and sufficient criteria for that issue. This is for instance what epistemology aims for when it analyses knowledge: it aims at the informative, necessary and sufficient conditions of knowledge. Thus, a successful analysis of composition should lead us to the informative, necessary and sufficient conditions of composition. But if this is the case, then brute perdurantism cannot be true, since it rests upon a principle of brute (diachronic) composition, which denies the existence of any informative, necessary, and sufficient conditions of (diachronic) composition. Brute perdurantists may reply that such an argument is circular, for it presupposes that “analysis of composition” is meant for any set of informative, necessary, and sufficient conditions of composition, whereas this is not necessary at all. As the analysis of a certain issue *x* may be understood as the account of the nature *x*, the analysis of composition may be understood as *any account of the nature of composition*. If so, analyzing composition should not result necessarily into informative criteria of composition. A stronger reply in favor of brute perdurantism may be that, as knowledge should not be analyzed in allegedly more basic concepts – such as belief and justification – according to Williamson’s “knowledge first epistemology” (Williamson 2000), in a similar way any analysis of composition is doomed to failure. This is not the place to demand an analysis of Williamson’s account; it is familiar enough to be invoked here without extensive commentary. The idea is that as Williamson argues with respect to knowledge, brute perdurantists may claim that facts about diachronic

⁸ See also (Sider 2001a, 121–22), who claims something in this direction.

composition are among the most fundamental ones. And for this reason, any attempt to analyze composition in other terms would be pointless, since composition itself is the most fundamental. Following Williamsons' slogan, brute perdurantism may claim that we should put "(diachronic) composition first": if composition might appear into some analyses, it will do so in the *analysans* rather than in the *analysandum*. That said, though some further questions concerning the consequences of such an account of diachronic composition are no doubt important ones (e.g. which is the relation between composition and causality? If composition facts are among the fundamental ones in explanatory terms, does it follow that causal facts among temporal parts are based on diachronic composition facts on those temporal parts?), they are enquiries I leave for another time.

Objection two: the *randomness of composition*. Suppose that for *reductio* brute perdurantism is true, and hence that brute composition is true. It follows that there are no criteria of diachronic composition. If so, one may claim, my temporal part today (or even your temporal part today) may be connected with any temporal part at another time, for instance with the temporal part of the US president tomorrow, and then with the temporal part of the president of Russia the day after. (I set aside more fantastic cases in which my temporal part today composes a perdurant object with the temporal part of a cat tomorrow, or with the temporal part of the Empire State Building in two days). One possible reply to this charge of randomness of composition consists in denying such a consequence of brute perdurantism. From the fact that there are no informative conditions of composition it does not follow that temporal parts compose perdurant objects randomly. To be clear, I am not saying that such a randomness of diachronic composition of temporal parts is not compatible with brute perdurantism, but rather that brute perdurantism is not committed to that. Thus, the idea of random diachronic composition of temporal parts within brute perdurantism is not incoherent and is actually hard to disprove once for all. But still, this gives us no reason to take it seriously.

Objection three: the *arbitrariness of composition*. A further objection against brute perdurantism concerns the absence of grounding for diachronic composition of temporal parts and the resulting charge of arbitrariness of the composition of perdurant persons. If there is no condition of diachronic composition of temporal parts, what explains the fact that a temporal part tomorrow is connected with *your* temporal part today so to form a perdurant person, rather than connected with some other temporal part today, such as *my* temporal part? Provided that composition is brute according to brute perdurantism, the answer is "nothing": facts concerning the diachronic composition of temporal parts are brute, unexplained and uncaused. And if diachronic composition is unexplained and uncaused, one may deduce that it is arbitrary too. Nonetheless, brute perdurantists may reject this charge by pointing out that arbitrariness does not follow from the absence of explanation and causal relation, for something may be unexplained and uncaused, and still not arbitrary. One may even argue that brute, unexplained, and

uncaused facts are actually the less arbitrary things in the world, in virtue of their being primitive: no arbitrariness obtains if a temporal part tomorrow is primitively connected with your temporal part today rather than mine.

Objection four: the *charge of obscurity*. Claiming that there are no criteria of composition, and that composition is unanalyzable, brute composition leads to a very obscure account of composition and personal persistence. This objection appears tantamount to the charge of “identity mysticism” advanced by (Zimmerman 1998) against anti-criterialist accounts of identity⁹: if identity over time is brute, then identity is nothing but mysterious. However, some advocates of a simple view may reject such a consequence¹⁰, arguing that the absence of criteria of identity, does not entail that things persist mysteriously, given that their persistence rest upon specific causal conditions. Otherwise said, a brute perdurantist may reply that although the diachronic composition of temporal parts into perdurants is brute, the existence of those temporal parts is not brute, since it rests upon *some informative causal conditions*: for instance, a temporal part of a sugar cube may exist if it is not put into boiling water, whereas a temporal part of a person requires a temperature much lower than 10000 degrees to exist. Still, I find this argument unsatisfying, as the charge of mysteriousness of personal persistence concerns the *conditions of diachronic composition* of temporal parts into a single perdurant, which are brute, and not the *conditions of existence* of temporal parts of those perdurants. For this reasons, arguing that the conditions of existence of temporal parts are informative and not brute cannot shed light on the mysteriousness of personal persistence as accounted by brute perdurantism.

At the end of the day, I think brute perdurantism may be a viable way for personal persistence within a four-dimensionalist framework, provided that one is willing to bite the bullet on a sort of mysteriousness of composition. Otherwise, brute perdurantism may be understood as a provisory answer to the diachronic composition question of temporal parts (a negative answer, to be precise), that we should endorse in absence of a better informative answer to that question. This is, for instance, what Markosian seems

⁹ Let me notice that the Zimmerman’s charge of “identity mysticism” against anti-criterialist accounts is intended specifically as a *materialistic* criticism against any simple views, which deny the so called “mereological supervenience thesis” (i.e. the thesis that *any whole necessarily depends upon its parts*). “If certain kinds of wholes are made entirely out of certain kinds of parts, then worlds that are ‘globally indiscernible’ with respect to what goes on at the level of these parts had better be ‘globally indiscernible’ with respect to what goes on at the level of wholes. To claim that it’s possible for there to have been differences in when and where persons are constituted by cells even if everything had been the same at the level of cells is to promulgate a kind of ‘identity mysticism’» (Zimmerman 1998, 295). For our purposes, however, both “identity mysticism” and “composition mysticism” do not have such a characterization, concerning rather respectively the obscurity of identity facts and the obscurity of composition facts.

¹⁰ See (Lowe 1996, 41–42) and (Merricks 1998, 119).

to have in mind when dealing with brute composition claims that “a coherent moderate¹¹ [i.e. informative in Markosian’s terms] answer to SCQ that is not susceptible to counterexamples and that does not entail that there can be genuine vagueness in the world would accord even better than BC with my intuitions. So if someone were to discover such an answer to SCQ, then I would endorse that answer [...] In the meantime, however, I am inclined to accept BC. For of all the known responses to SCQ, it alone is consistent with my pretheoretical views about the world’s composite objects.” (Markosian 1998a, 233). In next sections I shall offer some possible alternative in this direction, wondering whether they do accord better with our intuitions.

3.2. Nomological Perdurantism

In this section, I will consider what kind of relation may be traced among diachronic composition of temporal parts, causal relations, and laws of nature. I will discuss then a form of moderate perdurantism according to which temporal parts compose perdurant objects (and hence perdurant persons) if (and only if) they are connected by relations of a causal sort in compliance with the laws of nature. I label this view *Nomological Perdurantism*.

3.2.1. “The causal concrete” of temporal parts: diachronic composition and laws of nature

The idea that temporal parts are unified into perdurant objects on the basis of causal relations among those parts is not new in the metaphysical landscape and has been defended by several authors. Take for instance Russell, according to which a sequence of temporal parts composes a perdurant object if it falls under a causal law and specifically under a law of dynamics - see (Russell 1914, 1927); or Reichenbach, who refers to causal relations among states to avoid cases in which “the world-line of a human being [would] run through several different individuals” (Reichenbach 1957, 271). Then, also Armstrong appealed to causal relations in order to explain how temporal parts at different times “constitute a single thing that exists through time” (Armstrong 1997, 74). According to Armstrong, the necessity of a causal connection among temporal parts for these latter to constitute continuants rests upon the fact that spatiotemporal and qualitative conditions of continuity are not sufficient for persistence, for they may be satisfied accidentally. He

¹¹ Notice that Markosian’s use of “moderate answer” to special composition question differs from the way I use the notion of “moderate” (which includes brute composition as well), and stays rather for what I call “informative” or “complex” answer to composition and then “informative” or “complex” forms of perdurantism.

imagines hence the case in which one person is destroyed, and then some omnipotent being creates a duplicate of that person, precisely at the same place and time at which the first person was destroyed. This case is hence supposed to show that although spatiotemporal and qualitative conditions are satisfied, persistence over time is at least disputable. More recently (Balashov 2003a, 2003b, 2010) claimed that diachronic composition of temporal parts is restricted by causal connections among those parts, whereas (Effingham 2011b) restricted diachronic composition to compliance with the laws of nature.¹² Leaving a detailed historical analysis to those who are more able, I will focus on the arguments recently advanced by Balashov in favor of a restricted composition of temporal parts. This would serve as a perfect basis for what I call the nomological perdurantism about personal persistence.

In (Balashov 2003a), the author offers a defense of a principled restriction on diachronic fusions appealing to a broadly causal relation between temporal parts: in a nutshell, the idea is that things persist by having different temporal parts at different times, which are related by some immanent causal relations. Balashov's realist defense¹³ of a moderate account of perdurantism, and more specifically of a nomological perdurantism, arises from a reply to (Hudson 2002), in which the latter argues for the possibility of superluminal motion - i.e. the possibility that there are things moving faster than light. Hudson's argument is purely aprioristic, and challenges the constraint that there are no things moving faster than light. It is aprioristic for it arises "not from results in contemporary physics, but rather from a priori reflection on parthood, persistence, and motion" (Hudson 2003, 15). More specifically, it is based on the following metaphysical assumptions:

¹² On this issue, see also (Sider 2001a, 227), who explicitly refers to Russell and Armstrong as advocates of what I call "nomological perdurantism". According to (Robinson 1989, 401) a causal relation is fundamental for the connection among stages also for Lewis: "On this view [Lewis's view], it is because they are suitably related to one another that different matter-stages are stages of the same matter. Each stage is specially and appropriately causally dependent on its immediate predecessor for its existence and character". Still, in what follows I oppose nomological perdurantism (which is a form of restricted perdurantism) to Lewisian universalist perdurantism. Since a careful exegesis of Lewis's thought is not my primary concern in here, I am not going to discuss that further.

¹³ There are several passages in which it emerges that Balashov's account is strongly realist, such as: "I contend that diachronic composition can be profitably carved out from the medley of the surrounding issues more or less at the joints provided by nature itself. And I do subscribe to some sort of realism about the joints of nature" (Balashov 2003b, 23); "The laws of physics are truly universals: by their very nature, they apply to all physical objects without exceptions, and this, I believe, has nothing to do with any system of classification we may impose on the world. The laws are out there to be discovered." (Balashov 2003b, 28); "While some may view such partial rejection of universalism [i.e. a restricted diachronic composition] as arbitrary, I submit that it simply follows the joints of nature." (Balashov 2010, 88).

- A. DOCTRINE OF ARBITRARY UNDETACHED PARTS: according to which in addition to ordinary objects such as tables and books, the world includes also any arbitrary section of those objects, such as the boards of the tables, or the covers of the books.¹⁴
- B. TEMPORAL PART THEORY: things have temporal parts.
- C. PRINCIPLE OF UNRESTRICTED COMPOSITION: for any collection of things, there is an object that is the fusion of nothing but those things.¹⁵
- D. AN INTUITIVE SUFFICIENT CONDITION OF MOTION: according to which for something to be in motion within an extended, continuous, closed interval Δt , is to occupy a different region of space at every instant of Δt .¹⁶

He then assumes that there is a cone shaped object, which occupies a continuous three-dimensional region of space R , and whose height is 2 lights seconds [which is nearly 600 000km, but that's not the problem, if we agree with Hudson that it is intuitively plausible that there could be an object of this sort]. Call it Cone. Suppose that Cone exists for an interval T of one second, and call T -set the set of the instants within the interval T . Given the doctrine of arbitrary undetached parts, for every two dimensional section of R there is an object that exactly occupies that region,¹⁷ so that there are many cross-sectional parts of Cone. Call the set of those cross-sectional parts (or slices) the Slice-Set. Provided that the Slice Set and the T -set have the same cardinality (i.e. the former has non-numerable cross-sectional parts, the latter non-numerable instants), it is possible to draw a one-to-one correspondence between their members. Imagine a correspondence such that the cross-sectional part with the largest diameter is paired to the earliest instant of T , and for any two cross-sectional parts, the one with a larger diameter is paired with an earlier instant. This means that the cross-sectional part of Cone at the bottom is paired with the first instant of T , whereas the one at the top is paired with the last instant of T . Given the theory of temporal parts, the slices of Cone have temporal parts at any instant

¹⁴ More precisely, the doctrine of arbitrary undetached parts claims that necessarily, for any material object x , and regions, r and r^* , if r is the region x exactly occupies, and if r^* is any exactly occupiable subregion of r , then there exists a material object y , such that (i) y exactly occupies r^* , and (ii) y is a part of x . On arbitrary undetached parts see (van Inwagen 1981), (Carter 1983), (Heller 1990, 2–4), (Burke 1994b), and more recently (Varzi 2013).

¹⁵ On unrestricted composition, see section 1.8.1. above. For a complete discussion, see also (Varzi 2016, sec. 4.4) and (Cotnoir and Varzi forthcoming, chap. 2 and 5).

¹⁶ Or as (Hudson 2003, 16) puts it, "Necessarily, (a material object) x , is in motion during an extended interval t , if i) at every instant in t , x occupies a region of space, and ii) at no two instants in t does x occupy the same region of space." (Effingham 2011b, 700) formulates a similar assumption about motion, which adds the requirement that "[...] every region of space that it occupies at one instant is in almost exactly the same place as the region it occupies at the next instant." Since this addition brings no significant change to the case we are considering, I will continue referring to Hudson's formulation of the condition of motion.

¹⁷ (Effingham 2011b, 700) rejects that the doctrine of arbitrary undetached parts is a necessary premise for Hudson's argument, the theory of temporal parts and the principle of unrestricted composition being sufficient to claim that given an object that occupies a continuous three dimensional region of space R , for every two dimensional sub-region of R there is an object that exactly occupies that region.

of their existence; call them the t-parts of slices (where a t-part is a slice temporal part that exists at t).

Consider now the set called Quick-set, which is such that for every instant of t included in the T-set, the members of Quick-set are all and only the t-parts of the slice assigned to t. Given the principle of unrestricted composition, there is an object - call it Quick - composed by the members of Quick-set. Quick is a two-dimensional object, and given the condition of motion above, it moves faster than light – twice the speed of light to be precise. This is because during the interval T Quick occupies a different region of space at every instant of T, namely all cross-sectional regions of Cone, from the bottom one at the very first instant of T to the top one at the last instant of T. But this is in contradiction with a widely recognized consequence of Special Relativity, namely that there is no material object which moves faster than the speed of light. The conclusion drawn by Hudson is that such a principle is then false and must go.¹⁸

That scientific principles like the speed constraint may be refuted by metaphysicians and mereology scholars on the basis of apriori assumptions is a highly disputable claim, and I do not think many would be happy to accept that, *pace* Hudson. Rather, some may argue that the contradiction in Hudson’s conclusion should be taken in a different way, namely as a demonstration that some of his assumption(s) is (are) false. This is what (Balashov 2003a) and (Effingham 2011b) claim. Although accepting Hudson’s conditional claim, Balashov does not follow this latter on his modus ponens, arguing rather in favor of the opposite modus tollens. More specifically, he argues that the assumption to be rejected in order to account for the impossibility of superluminal motion¹⁹ is the principle of unrestricted composition, which characterizes the standard perdurantist account. It is not true, he continues, that all sums of temporal parts have the same ontological status: going back to the case above, Quick has not the same ontological status as Cone. To explain the substantial differences among material objects, Balashov introduces the distinction between two types of processes, namely “genuine causal processes” and “pseudo-processes”²⁰. A genuine causal process is a process that plays a physical roles, such as transporting energy, causal influence, or information; it is a process capable of *transmitting a mark*.²¹ On the other hand, a pseudo-process is no real physical process,

¹⁸ (Hudson 2003) actually distinguishes two non-equivalent claims which may be entailed by special relativity, namely (1) No material objects moves faster than light; and (2) There is no superluminal propagation of matter, energy, signals, or causal influence. His challenge concerns (1), not (2). For our purposes, however, this distinction will not matter.

¹⁹ For a detailed explanation concerning the impossibility of superluminal motion as a consequence of special relativity, see (Balashov 2003a, 1–2).

²⁰ The distinction appeared in (Salmon 1984, 142–47).

²¹ On mark transition, used by (Balashov 2003b, 23, fn. 1) in a general way to capture the notion of immanent causation, see (Reichenbach 1957, 136 and 271), (Salmon 1984), and for a comprehensive analysis (Zimmerman 1997).

for it does not propagate in space and time, nor it is able to transmit marks. Here is an instance of pseudo-process:

“Suppose a laser gun points to the eastern horizon. High overhead the sky is completely overcast. At some time the laser beam is switched on and the laser pivots in the vertical plane, sweeping the beam across the bottom of the overcast to the western horizon. Consider the circular motion of the light spot across the overcast. If the laser pivots sufficiently fast the spot will travel faster than light – a result found in physics textbooks. But the motion of the spot, very unlike the propagation of light from the laser to the clouds, does not constitute, in Salmon’s terms, a genuine physical process. One cannot use it to transmit a mark or information. For this reason, the superluminal motion of the spot is entirely unproblematic and does not conflict with relativity theory” (Balashov 2003a, 8)

Thus, the distinction between a causal process and a pseudo-process is such that a causal process transmits its own structure, whereas a pseudo-process does not (where the transmission of its own structure is revealed by the transmission of a mark). Keeping this distinction in mind would be helpful according to Balashov to distinguish robust perduring objects from mere sums of temporal parts. On the one hand, perduring objects are like processes, for they are composed by a series of temporal parts which are “causally cemented”; causal relations among temporal parts is the concrete of every perduring object. On the other hand, mere sums of temporal parts (such as Quick) are more like pseudo-processes, for their temporal parts are not causally related and do not compose any robust continuants. Things like the fusion of my left half body yesterday, and the Empire State Building today are nothing but “pseudo-objects”, which do not exist for they lack of immanent-causality interconnectedness. The diachronic composition of temporal parts is hence restricted to those cases in which there is a causal relation among temporal parts, a relation also called of “genidentity”²², which is conceived as a “broadly causal relation connecting items from different times and susceptible to regimentation grounded in robust physical dispositions such as the capacity for transmitting energy, momentum, and other conserved fundamental quantities” (Balashov 2003a, 11, fn. 9). Recognizing such a restriction of diachronic composition, I take Balashov’s account as a paradigmatic example of what I call a nomological perdurantism, which I define as follows:

²² The notion of genidentity has been defined by Reichenbach as follows: “Different states can be genidentical only if they are causally related. This conception agrees with our definition of causal connection, which considers the causal chain a signal, i.e. the transmission of a mark. To speak of recognition of the *same* mark implies a striation of space-time manifold. Not all world-lines can be interpreted as lines of the progress of a mark”(Reichenbach 1957, 271).

NOMOLOGICAL PERDURANTISM: Given various times and various temporal parts existing at each, there is a minimal D-fusion of those temporal parts at those times iff they are immanent-causally-interrelated.

To be clear, I am not saying that nomological perdurantism reduces to Balashov's perdurantist approach. I can accept in fact that a nomological perdurantism can be framed in slightly different ways - such as the one suggested by (Effingham 2011b), according to which temporal parts are unified into proper continuants if and only if they are related by some laws of nature. I shall take no view on which of these versions is the right way to frame what I call a nomological perdurantism; when I refer to nomological perdurantism and consider its advantages and problems, I refer to one of these theories.

3.2.2. Advantages of nomological perdurantism and some objections

Applied to personal persistence, which is the topic of my work, nomological perdurantism is the view that persons persist in virtue of having temporal parts at different times which are related by a sort of immanent causality²³. It is a moderate view and it is informative. But why should one find a nomological perdurantism desirable?

The first advantage of this approach to personal persistence is that it avoids the two problems of Lewisian universalist approach, namely the problem of the many and the problem of conventionality (cf. section 1.8.3). On the one hand it avoids the problem of the many for a nomological perdurantism does not commit its advocates to the existence a plurality of entities in the world, recognizing nothing but the objects related by immanent causation, and hence excluding the mere sums of temporal parts. As I pointed out above, according to a nomological perdurantism there is a significant distinction between robust four-dimensional objects and mere sums of temporal parts, which rests upon the fact that the former but not the latter are unified by causal relations, revealed by the phenomenon of mark transmission. Nomological perdurantism claims that immanent causality defines a natural restriction on diachronic composition, dividing real perduring physical objects from loose series of temporal parts, which do not compose anything. As things stand, nomological perdurantism seems to have a significant benefit, for it accords with our common sense, according to which there are persisting tables, cats, and persons, but not objects composed by a table yesterday, a cat today, and a

²³ Interesting to notice, a form of nomological perdurantism for persons seems defended also by (Reichenbach 1957, 270), who refers to the case of persons to account for the importance of causal relations for persistence: "If this decisive difference did not exist [i.e. the difference between things which are causally related and things which are not]... we could consider the continuation of yesterday's Mr. A to be today's ... Mr. B, and we could construct the world-line of a human being running through several different individuals".

person tomorrow. On the other hand, claiming material things (and among them persons) persist in virtue of temporal parts being related by immanent causality, a nomological perdurantism does not appear committed to any conventionality of persistence. That this sort of persistence is not a conventional or arbitrary matter is based on the reasonable assumption that laws of nature are not conventional or arbitrary, for they do not suffer subjective or cultural bias²⁴. Thus, as recognizing that an object obeys a certain law of nature - such as the Newtonian gravitational law - is independent from any particular culture, similarly recognizing that a series of temporal parts are causally related and constitute a person would be independent from any cultural or subjective assumption. Nonetheless, one may reply that there are cases in which it is not clear whether nomological perdurantism avoids the arbitrariness of composition. Take for instance a relativistic setting, in which there is no frame-independent notion of synchronicity. Provided that causal restriction of composition applies diachronically but not synchronically (i.e. the causal relations enter into composition relations across time, but not across space)²⁵, then diachronic composition does appear arbitrary, since it depends on the inertial frame we consider.²⁶

A further advantage of nomological perdurantism is that it provides us with a scientific approach to persistence, for it restricts diachronic composition on the bases of what our best scientific theories tell us. Nomological perdurantism is not scientifically revisionary (an allegation that some advocates of this approach might be happy to move against Hudson's universalism, in fact); on the contrary, nomological perdurantism can be characterized as a sort of "naturalized perdurantism", which takes the ontological credentials of a perdurant entity to depend on the behavior of such object in compliance with the relevant laws of nature. And provided that the relevant laws of nature are defined by our best scientific theories, the ontological commitments towards the perdurant entities in the world finally depend on our best scientific theories.

Finally, restricting diachronic composition to immanent-causal-interrelations among temporal parts, a nomological perdurantism seems able to provide us with a unique

²⁴ (Effingham 2011b, 704–5) advances a similar argument to reject the universalist "argument from cultural prejudice", according to which any restricted condition of diachronic composition is cultural dependent.

²⁵ See (Balashov 2003b, 25): "Objects that are not connected by immanent causality do not compose anything unless they belong to the same moment of time in the rest frame of their center of mass, in which case they may or may not compose something, depending on one's theory of synchronic composition [...] This is not to deny the univocal character of composition but only to distinguish two principal natural kinds of composition, which are mutually exclusive"; and then (Balashov 2010, 88): "The 4Dist is free to treat synchronic and diachronic composition differently. The latter may be causally grounded in a way the former is not. [...] Thus defending some version of restricted composition is not a prerequisite for resisting diachronic universalism. Accordingly, there is no pressure for the 4Dist to be a universalist across the board".

²⁶ This case has been also pointed out by (Hudson 2003, 19). (Balashov 2003b, 25ff) replies. For a clear analysis of the difficulties faced by any causal/nomological restriction of diachronic composition within the context of special relativity, see (Torre 2015).

constitutive condition of persistence for all material beings, avoiding to account for a condition which is specific for perdurant persons. This may be particularly attractive for all those who are sympathetic the Spinozian idea that we should not create any *imperium in imperio* for persons²⁷, and hence no special conditions of persistence for them. As an answer to the hard diachronic composition question for persons (cf. section 1.6 above), a nomological perdurantist account of personal persistence may be hence defined as follows:

NOMOLOGICAL PERDURANTISM OF PERSONAL PERSISTENCE: Given various times and various temporal parts existing at each, there is a minimal D-fusion of those temporal parts at those times, and this fusion is a person, iff they are immanent-causally-interrelated.

However, some may find such an answer to the diachronic composition question for persons not completely convincing, since it cannot account for the fact that the perdurant in question is a person rather than, say, a table. As a matter of fact, the way nomological perdurantism of personal persistence has been formulated is precisely the same as nomological perdurantism above, with the additional requirement that the fusion of the temporal parts in question is a person. But such a requirement does not belong to the constitutive condition of diachronic composition (and hence to the constitutive condition of persistence in a perdurantist framework). Several replies are available. The first one may be that there are other cases in which the constitutive condition of diachronic composition is the same both for material objects and for persons – such as in the case of brutal perdurantism above. For this reason, it does not constitute a particular charge for nomological perdurantism. However, one may reply that a brutal perdurantism has a specific way to avoid a problem of this sort, which is not available to nomological perdurantism. Claiming that diachronic composition is brute, and hence there is no informative condition of personal persistence, brute perdurantism may also argue that it is a brute fact that in some cases a collection of temporal parts constitutes a perdurant *which is a person*, whereas in some other cases it constitutes a perdurant *which is not a person*. I find this argument in defense of brute perdurantism reasonable, but still, I think that a similar answer is viable for nomological perdurantism as well: its advocates could maintain, for instance, that the kind of a certain perdurant is determined by the laws of nature connecting the stages into a unique perdurant entity. Thus, the fact that a certain perdurant is a person rather than a table might rest upon the fact that the laws of nature connecting those temporal parts are the laws of biology rather than, say, the laws of thermodynamics. But provided that several kinds are subjects of the same laws of biology (persons, monkey, cats, etc.), how may we account for the differences between

²⁷ Cf. Spinoza's *Ethics*, part III, preface.

perdurants of different kinds (perdurant persons, perdurant monkey, perdurants cats, etc.)? One possibility may be to argue that along with the laws of nature, some further contingent facts are required in order to account for the differences of perdurants – such as a specific kind of DNA, or morphological facts, or evolutionary facts, etc. This means, however, that a nomological perdurantism for personal persistence framed in this way needs some further conditions of diachronic composition of temporal parts along with the laws of nature: laws of nature result then necessary but not sufficient conditions for *personal* persistence.

Another way to account for perdurant persons within a nomological perdurantism, may be to say that a perdurant person is a fusion of temporal parts which are immanent-causally-related and which instantiate the property of being a person. This would lead to following slightly different definition of nomological perdurantism for persons:

NOMOLOGICAL PERDURANTISM OF PERSONAL PERSISTENCE*: Given various times and various temporal parts existing at each, there is a minimal D-fusion of those temporal parts at those times, and this fusion is a person, iff i) they are immanent-causally-interrelated; and ii) each temporal part instantiates the property of being person.

However, this is in contrast with the (weak and non-essentialist) definition of temporal parts of persons introduced above in section 1.5.1, namely:

Temporal Part of Person_{df} (i) x is a temporal part of y at Δt , and (ii) y is a person.

According to this definition, which is not committed to an essentialist account of persistence and is the one used in my entire work, no restriction is required to the temporal part itself: a temporal part is a temporal part of person if it is part of a certain perdurant and that perdurant is a person. Obviously, the only fact that so far I have used a certain definition of temporal part of person rather than another cannot constitute a definitive argument in favor of the former. Rather, what I want to show is that such a “Nomological Perdurantism of Personal Persistence*” does not come for free, for it requires a substantial modification of some fundamental notions.

Besides that, I suspect a nomological perdurantism may be subject of several other objections.

First of all, one may reject nomological perdurantism for its answer to the diachronic composition question rests upon what empirical sciences (such as microphysics, physical chemistry, and biology) say about causal relations among entities. Still, one may argue, the diachronic composition question needs an answer that has to express a proposition which is necessary true, whereas empirical sciences cannot express such propositions. It

follows that empirical sciences cannot answer the diachronic composition question²⁸. Provided that the causal relations among temporal parts (which according to nomological perdurantism are the necessary and sufficient conditions for diachronic composition) are the ones recognized by empirical sciences, nomological perdurantism ends up being unable to answer the diachronic composition question. I do not think this is a very strong argument against a nomological perdurantism, being rather the opposite side of what I pointed out as an advantage of nomological perdurantism, namely its being a “naturalized” account of persistence.

Second, one may argue that referring to a general notion of immanent-causal-interrelation is not sufficiently informative, for it leaves open what kind of causal connections we have to consider when dealing with the diachronic composition of temporal parts of persons. Even accepting that there is a difference between the causal relations holding between temporal parts of the same perdurant entity (say my temporal parts) and the causal relations holding between temporal parts of distinct perdurant entities (say, my temporal parts and your temporal parts), one may be skeptical that any sort of necessary account of such difference may be appropriately explicated²⁹. There are so many different causal relations in the world, and so many different causal relations among temporal parts of persons, that it may be not clear at all which one is the necessary and sufficient constitutive condition of diachronic composition. And as empirical sciences cannot help us with that, nomological perdurantism appears losing in explanatory terms. One may follow Balashov and argue that perdurant entities have their temporal parts unified by a relation of causation (immanent causation), which is generally captured by a transmission of mark or information. But this does not seem to explain the different kinds of causal relations, and among them the relations of immanent causation which are said to ground the diachronic composition of persons. Take for instance the generation of a foetus. During the act of conception, there is a transmission of information from two individuals (call them A and B), under the form of fertilization of an egg by a sperm. Provided that there is a transmission of information from temporal parts of A and B to the stage of the foetus, it seems possible to recognize a form of immanent causation from the temporal parts of A and B, and the stage of the foetus. If nomological perdurantism

²⁸ See (Markosian 1998a, 229), who offers a similar argument in defense of a brutal composition while dealing with the special composition question in synchronic terms.

²⁹ See for instance (K. Miller 2010, 575, fn. 10): “One might object that there is a difference in kind between the relation that holds between each of my person-stages, and the relation that holds between my person-stages and the person-stages of other persons. Namely, my person-stages are causally related to each other in ways that my person-stages are not causally related to the person-stages of other persons. I am sympathetic to this claim, and it might be that appropriately explicated, appeal to causal relations could at least ground the difference between self and other, and possibly also then in part ground the justification of our normative practices. I do think, however, that since causal relations abound, this strategy requires a very robust account of what sorts of causal relations hold between person-stages of the same person, and what sorts of causal relations hold between person-stages of distinct persons. As it stands I do not think we have anything like the sort of account that would be necessary.”

is right, then it would follow that diachronic composition obtains twice: on the one hand between A's temporal parts and the temporal parts of the foetus; on the other hand between B's temporal parts and the temporal parts of the foetus. But this sounds really awkward. Does it mean that the perdurant A (or the perdurant B) and the foetus are the same perdurant person? It follows a case in which both a fusion and a (double) fission occur: if the transmission of mark is the necessary and sufficient condition of diachronic composition of temporal part, the foetus would compose a perdurant entity both with A's temporal parts before the conception and with B's temporal parts before the conception. Simultaneously, A's and B's temporal parts are causally connected with other temporal parts, respectively some temporal parts after the conception which are not the temporal parts of the foetus. But this means that both A and B also fall into a fission case. More in general, a too loose account of causal relations among temporal parts does not appear able to explain the right way diachronic composition occurs. One may reply that proper immanent causal relations are the ones based on the laws of nature, in line with the spirit of (Effingham 2011b). But this leads to the following problem, based on the plurality of laws of nature.

Suppose we accept the existence of some genuine immanent causal relation. Still, we face the possibility of a plurality of causal relations among temporal parts, based on the fact that a plurality of laws of nature are recognized by different sciences. This is not a problem in itself, and a position of this sort has been defended for instance by (Rosenberg 1993, 705–6), who claims as follows:

“Once we give up the search for a chimerical single right answer to the SCQ, we can also abandon the notion that biology is somehow better suited to describe compositional causal relations than, say, physics or chemistry. Instead we can regard the *various* special sciences as, *inter alia*, telling us about the particular multigrade causal relations in virtue of which diverse (natural) *kinds* of components add up to determine (natural) *kinds* of composites. Microphysics explains how protons, neutrons, and electrons compose different species of atoms, and physical chemistry, how atoms of various species compose different sorts of molecules.” (Rosenberg 1993, 705–6)

And the same line of reasoning may be applied to diachronic composition, so that various special sciences tell us about the particular causal relations in virtue of which diverse kinds of temporal parts add up to determine some kinds of perdurants. Still, one may find controversial that different types of objects require different answers to the special composition question (in particular in his diachronic version). This is, for instance, what (Markosian 1998a, 229) claims, when he rejects that a plurality of answers to the special composition question may rest upon the plurality of compositional causal relations defined by special sciences. As far as persons are conceived, a further problem concerns the definition of the specific kind of causal relation we should consider as the glue of personal temporal parts. I shall argue that this is not a real problem for nomological

perdurantism, at least as far as we may accept that different forms of nomological perdurantism are available, depending of the specific causal relation we accept for personal persistence. Moreover, if this is right, it follows that a nomological perdurantism may also be framed so to include some mentalist account of personal persistence, such as the account defended by (Shoemaker 1984), according to which personal persistence is based on the causal connections among mental states of person stages at different times³⁰.

Finally, nomological perdurantism does not seem able to avoid the argument from vagueness, which is a major objection against any moderate form of perdurantism. This is consequence of the fact that the constitutive condition of diachronic composition accepted by nomological perdurantism, namely the immanent causal relation between temporal parts, comes in different degrees³¹. In fact, given two entities (or in our case two temporal parts), is it reasonable to think that these two entities may be more or less causally connected, i.e. there are different degrees of mark transition. But if immanent causality is a matter of degree, then vague restriction on composition cannot be avoided by nomological perdurantism. And if there is a vague restriction on composition, then it would be possible that in some cases it is indeterminate whether or not composition occurs, and hence whether or not a certain composite object exists. But since this is impossible (provided we do not want to accept vagueness in existence), composition cannot be restricted in terms of immanent-causality-interrelatedness. And hence nomological perdurantism should be rejected. An argument of this sort has been advance by Hudson, who claims that any causal restriction of diachronic composition leads to vagueness of composition and hence to cases of indeterminacy in composition, identity, and existence.³²

³⁰ "Reverting to the 'person-stage' terminology, two person-stages will be directly connected, psychologically, if the later of them contains a psychological state (a memory impression, personality trait, etc.) which stands in *the appropriate relation of causal dependence* to a state contained in the earlier one; and two stages belong to the same person if and only if [...] they are connected by a series of stages such that each member of the series is directly connected, psychologically, to the immediately preceding member» (Shoemaker 1984, 90–91, my italics). On the idea that identity over time can be analyzed in terms of "immanent causation" see (Shoemaker 1979).

³¹ Let me notice in passage that a nomological perdurantism may suffer another kind of vagueness as well, in case the diachronic composition of temporal parts rest upon some laws of nature which are stochastic. If this would be the case, vagueness of diachronic composition would be a consequence of an ontological vagueness concerning the laws of nature. However, I shall not go into such problem here, interesting though it is, focusing rather on the case of vagueness derived from the fact that causal relations among temporal parts come in different degrees.

³² Referring specifically to the case of temporal parts of person, he claims: "to say that these two person-stages are immanent-causally related is to say that there is a certain type and degree of causal dependence of the one upon the other. [...] But as with other plausible restrictions on composition, a restriction in terms of *immanent-causality-interrelatedness* invokes a vague term (namely, *that one*) and consequently there can be borderline cases of its application". (Hudson 2003, 18ff)

Some advocates of nomological perdurantism might reply to the charge of vagueness by rejecting the idea that causal relations come in degree. Although this view is not incoherent, the fact that no one has yet formulated a plausible instance of non-gradual causal relations, and that the chances of anyone's doing so seem very slim, I see no reason to take this reply seriously.

A different way for nomological perdurantists may be to bite the bullet on this issue and accept that a sort of vagueness is involved in diachronic composition. What they may argue to defend their moderate perdurantist account is rather that a restriction in diachronic composition based on causal relations does not bring any new sort of vagueness in the world, for vagueness is already involved in accepting spatial ordinary objects. This is what also (Balashov 2003a, 11, fn. 9) claims, distinguishing two natural kinds of composition – namely synchronic composition and diachronic composition – and then locating vagueness just on the synchronic kind.

“O may or may not survive a loss, acquisition, or scattering of spatial parts, but this has nothing to do with the question of what objects existing at t₂ (in a certain frame) are pairwise immanent-causality-related to what objects existing at t₁ (in that frame). Composition^d [diachronic composition] is never vague at the microlevel. The problem of vagueness is quite orthogonal to composition^d.” (Balashov 2003b, 26)

Thus, it follows that what is vague is not the immanent-causal relation between temporal parts, which is “simply a physical fact that could, in principle, be observed in mark transmission” (Balashov 2003b, 26). What is vague is rather whether the causally related spatial parts of those temporal parts synchronically compose temporal parts of the same object. However, as (Torre 2015) precisely pointed out, Balashov's sharp distinction between a (vague) synchronic composition [composition^s] and a (restricted) diachronic composition [composition^d] is based on a frame-invariant notion of objects which are timelike separated. But this is not what happens within the context of special relativity, in which the notion of different times is a frame-relative notion. And if the notion of different times is a frame-relative notion, it follows that a composition being a composition^d than a composition^s is a matter of frame of reference. And if this is right, a univocal distinction between composition^s and composition^d does not appear available, nor it is viable the possibility to unload vagueness on the former.

3.3. Phenomenal Perdurantism

In section 2.5.4. I have analyzed the relation between temporal parts of persons and the unity of consciousness, referring in particular to Heller and to his reply to Chisholm's argument against four-dimensionalism. In this section, I aim at defending a new

perdurantist account of persistence over time, which is mentalist and is based on *phenomenal* continuity.

3.3.1. Phenomenal continuity: a new mentalist approach to personal persistence

In section 1.2.1. I introduced the mentalists accounts of personal persistence as the accounts according to which people persist in virtue of some sort of mental aspects. Mentalist accounts are complex views, since they recognize the existence of some informative necessary and sufficient conditions for diachronic personal identity. Provided that within a perdurantist framework any account of personal persistence is characterized by the way it answers the (hard) diachronic composition question (cf. section 1.6), a mentalist perdurantism of personal persistence may be defined as follows:

MENTALIST PERDURANTISM OF PERSONAL PERSISTENCE: Given various times and various temporal parts existing at each, there is a minimal D-fusion of those temporal parts at those times, and this fusion is a person, iff they are mentally-related.

Mentalist perdurantism is a moderate perdurantism (i.e. it is neither universalist nor nihilist about diachronic composition) and it is informative (i.e. there is an informative condition for the diachronic composition of temporal parts into a single perdurant)³³. Still, there is an important aspect we should keep in mind: as for mentalist accounts of personal persistence in general, mentalist perdurantism does not account for just a single view about personal persistence. Rather, it labels a cluster of views, which differ on the specific mental relation unifying the temporal parts, such as memories, beliefs, intentions, consciousness, first-person perspective, etc. Let me call “psychological account” the traditional version of the mentalist view of personal persistence, since it hinges on psychological relations being the constitutive conditions of personal persistence, where psychological relations are kind of causal relations. Among the psychological relations that are deemed relevant for our persistence, one can find the continuity of the memories advocated by (Locke 1975), or the functional continuity of the psychological states defended by (Shoemaker 1984), or the continuity of the first-person perspective recently defended by (Baker 2000, 2013), (Noonan 2003, 2010b, 2010a), and (Perry 2010, 2011). Thus, a psychological perdurantism would be so defined:

³³ I am aware that some authors have defended a brute understanding of their psychological accounts of personal identity over time - see (Baker 2012, 2018) and (Nida-Rümelin 2012). Still, I am putting those positions aside.

PSYCHOLOGICAL PERDURANTISM OF PERSONAL PERSISTENCE: Given various times and various temporal parts existing at each, there is a minimal D-fusion of those temporal parts at those times, and this fusion is a person, iff they are *psychologically-related*.

A defense of psychological perdurantism may be found, among others (and more or less explicitly, at least as a defense of a psychological account of personal persistence plus a theory of temporal parts), in (Perry 1972, 1975), (Shoemaker 1963, 1984), and (Noonan 2003, 2010a). However, besides psychological perdurantism, we ought to recognize a further mentalist approach in perdurantist terms, based on the so called the *phenomenal account* of personal persistence. I will spend some words on that before introducing the corresponding perdurantist approach.

Advanced by (Dainton and Bayne 2005),³⁴ a phenomenal account of personal persistence claims that personal persistence rests upon the phenomenal continuity between experiences – where two experiences are phenomenal continuous if they are experienced together, and hence belong to the same stream of consciousness.³⁵ In a nutshell, according to a phenomenal account of personal persistence, having phenomenally continuous experiences is what it takes for a person to persist over time. This view is mentalist, for it claims that personal persistence is determined by some sort of mental continuity (phenomenal continuity to be precise), but it is distinct from psychological accounts, for it rejects the necessity of any continuity of psychological states, such as memories or beliefs. In other words, what is constitutive of personal persistence according to the phenomenal approach is the fact that different experiences belong to *one and the same stream of consciousness*, regardless of the content of such experiences. This is the way they put it:

“The approach in question is [mentalist] to the extent that it construes personal identity in terms of relationships between mental states and capacities, but it parts company with

³⁴ Let me point out that although Dainton and Bayne maintain they just want to establish “that the phenomenal approach merits the attention lavished on the more orthodox alternatives” (Dainton and Bayne 2005, 550), rather than explicitly defending it, I find reasonable to consider them as advocates of this view. For a defense of phenomenal continuity as a condition of personal identity over time, see also (Torrengo and Buonomo 2018), which offers an indirect argument in support of phenomenal continuity based on a thought experiment involving identity over time in a time travel scenario.

³⁵ On this issue, see (Dainton and Bayne 2005, 553–54), who also argue that phenomenal connectedness as experience of togetherness does not imply any higher-order experience. “This experienced togetherness, this unity-within-consciousness, is how phenomenal connectedness is manifest at any one time. In saying that an auditory and visual experience are ‘experienced together’ we do not mean to imply that their unity depends on the occurrence of some additional higher-order experience. Higher-order states of consciousness do exist, but our experience at any one time are unified even when we are not thinking about them. Phenomenal connectedness is simply that relationship of experienced togetherness that holds between all the diverse contents of a typical state of consciousness at a given time, higher-order thoughts included.” On the constitution of the self as the result of a unifying, integrative, synthesizing ‘selfing’ process, see also (Di Francesco, Marraffa, and Paternoster 2018).

mainstream [mentalist] accounts of personal identity in focusing on *phenomenal* rather than *psychological* continuity. Whereas the latter is a causal relationship, the former is purely experiential. Roughly speaking, experiences are related by phenomenal continuity when they belong to unified streams of consciousness of the sort we generally enjoy.” (Dainton and Bayne 2005, 549).

To get the difference between the phenomenal and the psychological account of personal persistence, it may be useful to consider some imaginary cases in which normally concomitant continuities separate. Consider first an imaginary case, like a brain-transplant (Shoemaker 1963) or a brain-state transfer (Williams 1970), in which bodily continuity and mental continuity split. Suppose that all mental features of one individual A are transferred in the body of another individual B (and viceversa). In a case like that, advocates of the phenomenal approach and defenders of the psychological view agree on the direction of personal persistence: each individual would persist where all mental features are entirely transferred, so that A would persist within B’s body, and B would persist within A’s body. Thus, in opposition to somatic views (cf. section 1.2.2. above), both mentalist accounts would say that the continuity of some relevant mental aspects are constitutive of personal persistence.

However, the phenomenal approach differs from more traditional mentalist views as soon as we consider cases of *partial* mental transfer, in which only some mental features are transferred from one individual to another. In particular, a phenomenal approach predicts that personal identity is determined by phenomenal continuity of experiential states rather than psychological continuity of memories and beliefs. To see how the view differs from more psychological approaches, consider two imaginary devices. The first one, the *streamal diverter* (SD), is able to divert the stream of consciousness from one brain to another in a very short period of time (let say in no more than a second, within the duration of the so-called ‘specious present’). The SD ensures *only* the phenomenal continuity through the transfer of the stream of consciousness from one brain to another. The SD does not transfer memories, beliefs, intentions, or any other psychological state, and hence it has no impact on the psychological continuity. The second device, the *brain-state transfer device* (BSTD), does the opposite: it transfers all psychological states, and hence it leads to psychological continuity, but it does not affect the stream of consciousness. Consider now two possible scenarios in which the two kinds of mental continuity part company.³⁶

First scenario: imagine using the BSTD (but no SD). Given two individuals, Barack and Donald, the BSTD transfers Barack’s psychology to Donald’s brain, and Donald’s psychology to Barack’s brain. Since no SD is used, no phenomenal states are transferred, and neither Barack’s nor Donald’s stream of consciousness is affected. Such a case would be similar to a brainwashing, in which a subject remains conscious through a period of

³⁶ These cases are presented by (Dainton and Bayne 2005, 556ff).

time, but she ends up with very different beliefs, intentions and memories from the one she had before the brainwash. And as far as we agree that cases of brainwashing are not cases in which persons fail to persist, we should think the same in this first scenario in which only BSTD is used, namely that the person before the brainwash is numerically identical to the person after the brainwash (no matter how changed he or she is). Thus, it is plausible to think that Barack and Donald persist in their original bodies, where both physical and phenomenal continuity are supposed to obtain (although *after* the use of the BSTD they have very different psychological states – different memories, different beliefs, etc.).

Second scenario: imagine using the SD (but no BSTD) on Barack and Donald. The SD transfers Barack's phenomenal continuity (i.e. his stream of consciousness) to Donald's brain, and Donald's phenomenal continuity to Barack's brain. Since no BSTD is used, psychological states are not affected, and hence they remain the same both in Barack's and Donald's original bodies. Using just the SD we would have a case in which phenomenal continuity is isolated from both the physical and the psychological continuity. Who is who in this second scenario? According to a phenomenal account of personal persistence, the answer is rather easy, and meets our intuitions: if the stream of consciousness is transferred from one body to another, Barack persists with Donald's body and memories, and the other way around for Donald. Both Barack and Donald *find themselves* in a new body with alien memories and intentions. As things stand, a phenomenal approach to personal persistence has the advantage of meeting our intuitions in both cases, whereas the continuity of psychological states seems to account for our intuitions only partially.

Although the phenomenal approach as formulated by Dainton and Bayne is not explicitly committed to any specific account of persistence, it seems natural to pair their view with some form of endurantism, which is the standard account of persistence. Let us then wonder whether a phenomenal approach may be declined within a perdurantist framework as well.

3.3.2. Phenomenal continuity and temporal parts

If things persist by having different temporal parts at different times, a phenomenal account of persistence leads to what I call a *phenomenal perdurantism*, which can be defined as follows:

PHENOMENAL PERDURANTISM: Given various times and various temporal parts existing at each, there is a minimal D-fusion of those temporal parts at those times iff *there is a phenomenal continuity between the experiences of those temporal parts*.³⁷

Applied to personal persistence, phenomenal perdurantism would be hence:

PHENOMENAL PERDURANTISM OF PERSONAL PERSISTENCE: Given various times and various temporal parts existing at each, there is a minimal D-fusion of those temporal parts at those times, and this fusion is a person, iff *there is a phenomenal continuity between the experiences of those temporal parts*.

Moreover, if according to a phenomenal account of persistence phenomenally continuous experiences are such that they belong to the same stream of consciousness, a phenomenal perdurantism may be also defined as follows:

PHENOMENAL PERDURANTISM OF PERSONAL PERSISTENCE (II): Given various times and various temporal parts existing at each, there is a minimal D-fusion of those temporal parts at those times, and this fusion is a person, iff *the experiences of those temporal parts belong to the same stream of consciousness*.

It follows that according to phenomenal perdurantism, given a plurality of temporal parts, these latter constitute one and the same perdurant person if and only if their experiences belong to the same stream of consciousness. These two formulations of phenomenal perdurantism express hence two possible ways to frame a phenomenal account of personal persistence within a perdurantist framework, which are equivalent as far as the notions of “being phenomenally continuous” and “belonging to the same stream of consciousness” coincide.³⁸

³⁷ One may wonder whether the condition that *there is a phenomenal continuity between the experiences of temporal parts* (hereafter condition (A)) is an informative condition of diachronic composition, and hence of persistence. If such condition is not informative, phenomenal perdurantism would result better classified as a kind of brute perdurantism, rather than as a complex perdurantism; in other words, phenomenal perdurantism of personal persistence is not a brute perdurantism if (and only if) the condition (A) of diachronic composition is informative. In order to be an informative condition of diachronic composition, the condition (A) cannot presuppose the composition that it is meant to give conditions for. I will assume that the condition (A) formulated in terms of a *relation between experiences of temporal parts*, is informative since it does not presuppose the fact that those temporal parts compose a single perdurant entity. Nonetheless, I do not exclude the possibility of a brute reading of a phenomenal perdurantism, which would follow the denial of the informativity of (A). That said, though the further question as to whether and to what extent (A) is informative is no doubt an important one, it is an enquiry I leave for another time.

³⁸ One may wonder whether “coincidence of concepts” is here to be intended extensionally or intensionally. If phenomenal perdurantism is conceived as a contingent claim, holding only at the actual world, an extensional claim may suffice. However, if we want to argue for a stronger claim, namely that *being*

Now, before going ahead, I wish to be very clear that throughout this section I shall be using the term “phenomenal perdurantism” as an umbrella for all theories according to which there is a sort of phenomenal continuity among the experiences of temporal parts constituting one perdurant person. I shall do that although different kinds of phenomenal perdurantism are available in fact, depending on the way phenomenal continuity is understood (for instance, in terms of a continuity of point of view; or in terms of a continuity of first-person perspective; or in terms of a continuity of a stream of consciousness; or even in terms of a strong continuity of some sort of “for-me-ness”). I will come back to those different sorts of phenomenal perdurantism when I will consider some problems of phenomenal perdurantism, wondering whether any of those accounts is able to offer any interesting solutions. Still, it is important to keep in mind that those forms of phenomenal perdurantism agree on one important aspect, namely that the diachronic composition of temporal parts rests upon a relationship which is not causal, but purely experiential. Purely experiential relations among temporal parts is the common denominator of different sorts of phenomenal perdurantism.

Let us now wonder why a phenomenal account has not been explored so far within a perdurantist framework. A plausible answer is that phenomenal continuity appears, at least at first sight, more compatible with an endurantist account of the self, according to which the self is something which is entirely present at any moments of its existence. It follows an endurantist account of the self, based on our “sense of filling each moment in time by occupying it with one’s whole self, rather than overflowing it with parts that occupy other moments” (Hofweber and Velleman 2011, 38). I see at least two possible replies to such an argument against the possibility of a phenomenal perdurantism.

The first one consists in distinguishing an objective conception of the self, which perdures and hence persists by having different temporal parts at different times, and a subjective conception of the self, which endures and persists as wholly present at any moment in which it exists. This may sound similar to what L.A. Paul argued in a recent paper, where she offers an account of what she calls a “subjectively enduring self” – cf. (Paul 2017). But if according to Paul subjective selves are as real as the objective ones, the distinction I have in mind should not be committed to such a perspective. Rather I think that distinguishing a subjective enduring self from an objective perduring self may serve as a good way for phenomenal perdurantists to justify the fact that although subjectively our selves seem to endure,³⁹ they may objectively perish. Thus, the

phenomenally continuous and belonging to the same stream of consciousness are necessarily co-extensional, namely intensionally equivalent even if they are different concepts, we should opt for an intentional reading of the notion of coincidence. As far as my work is concerned, I tend to prefer the intensional account of their coincidence.

³⁹ As Thomas Sattig pointed out, one may find hard to make sense of the claim that “subjectively I seem to endure”, as it imports a metaphysical distinction (endurantism/perdurantism) into the realm of experience. What I perceive, Sattig argues, is that I persist, and that I seem to be the continuing subject of a temporally

perdurantist account of the self I have in mind is more similar to the one defended by (Velleman 2006), according to which the idea of an enduring self emerges from the structure of experience and experiential memory. This is so because when we remember our past, we remember the world as experienced from the perspective of past selves – where each memory has an egocentric representational scheme, that is to say a scheme which is centred on the person who originally had the experience which is now remembered.

A further argument in defense of phenomenal perdurantism rests upon the distinction between phenomenal continuity and continuity of the self. I agree that the continuity of the self, characterized among others by (Swinburne 1984) and then (Lowe 1996) in terms of the continuity of an unanalyzable “subject of experience”, is more in line with endurantism. Selves as subjects of experience are here conceived as nothing but simple mental substances which lack any substantial parts, and which are the owners or subjects of their experiences and actions in a primitive sense – cf. (Lowe 1996, 5–6). However, phenomenal perdurantism is not committed to any kind of equivalence between phenomenal continuity and the continuity of a self: what phenomenal perdurantism claims is that diachronic composition of temporal parts rests upon the experiential continuity of those temporal parts, rather than upon the continuity of the self or the subject of experience. This does not mean that a phenomenal continuity is not compatible with the continuity of a subject of experience; rather it means that if the continuity of a subject of experience obtains within a perdurant, this is a derivative fact, based on the continuity of the experiences of the temporal parts composing that perdurant. Still, it is important to notice that this solution is based on a specific account of the relation between a stream of consciousness and its owner, according to which phenomenal continuity of experiences within a stream of consciousness “can be understood independently of the notion of subject of experience” (Dainton and Bayne 2005, 561). I am aware that some may reject this view, arguing that streams of consciousness cannot be identified without prior reference to their owners;⁴⁰ and if so, the distinction between phenomenal continuity and continuity of the self would not appear viable. Although this approach is coherent and hard to disprove, I see no reason

extended experience, rather than what grounds my persistence. If so, the claim ought to be paraphrased as follows: “although subjectively our selves seem to persist *and to be* wholly present at any moment of our existence, they may objectively persist *and have* different temporal parts at different times.” I guess that this worry concerns a more general question, namely whether differences in what grounds a certain fact F (e.g. the fact that I persist through time) entail differences in the way we perceive F. Although this issue surely deserves more attention, I will not discuss it further, as it goes outside the scope of my research. In what follows I will continue using notions as “subjective enduring self” in the way they have been discussed in contemporary debates (see Velleman 2006, Hofweber and Velleman 2011, and Paul 2017). Also, I shall set aside any theory of the self as an entity “outside the world” – see (Bottani and Tomasetta 2018) – in which the distinction between enduring/perduring self would not appear viable.

⁴⁰ On this issue, see (van Inwagen 1990b, 206), who claims that the notion of subject of experience (“conscious subject”) is essential in order to account for the notion of continuous consciousness.

to take it more seriously and then reject the distinction between phenomenal continuity and continuity of the self.

Let me conclude by pointing out the difference between a phenomenal perdurantism and a view recently defended by Velleman – cf. (Velleman 1996), and above section 1.1.. In line with a Parfitian account of personal persistence, according to which identity does not matter for survival, Velleman argues that identity does not matter for our self-regarding concern about the future; what matters is rather the future person whom I can now regard as self (i.e. the person whose point of view I'll have access).⁴¹ But according to a phenomenal perdurantism identity still matters: phenomenal continuity among temporal parts is what grounds the diachronic composition of those temporal parts into one and the same perdurant person, which is extended over time and numerically identical to herself.

3.3.3. Advantages of phenomenal perdurantism and some objections

As the moderate accounts of perdurantism so far considered, the first advantage of a phenomenal perdurantism is that it escapes the two problems of Lewisian universalist approach, namely the problem of the many and the problem of conventionality (cf. section 1.8.3). On the one hand, it avoids the problem of the many as it does not assert that all sets of temporal parts are such that they compose some perdurant entities: diachronic composition occurs if and only if temporal parts are phenomenally-interrelated, so that a continuity of phenomenal experiences obtains among those temporal parts. Thus, as far as my stream of consciousness and your stream of consciousness are separated – so that there is no phenomenal continuity among my experiences and your experience – no perdurant entity composed by my temporal part today and your temporal part tomorrow could be legitimately included in the inventory of the world. The persons populating the world of phenomenal perdurantism are all and only those entities extended over time, and whose temporal parts have experiences which belong to one and the same stream of consciousness. On the other hand, it avoids the charge of conventionality of personal persistence, that is to say the charge of reducing personal persistence to a conventional matter. Given phenomenal perdurantism, it is not up to us to say which perdurant object is a perdurant person, since persons are all and only the fusions of the relevant set of temporal parts, namely the set of temporal parts which are phenomenally-interrelated. The unity of temporal parts into one perdurant person is hence something metaphysically substantial, which is not reducible to some

⁴¹ “What matters most, I shall suggest, is not whether the person I now regard as self will survive into the future; it is whether there will be a future person whom I can now regard as self. And whether I can regard a future person as self, I shall argue, doesn't necessarily depend on whether he will be the same person as me; it depends instead on my access to his point of view.” (Velleman 1996, 42).

sort of unification based on conventional practices, like the way we are supposed to use the notion of “person” within a certain context of reference. Arguing that the diachronic composition of temporal parts into perdurant persons is metaphysically substantial, advocates of phenomenal perdurantism would be then able, at least in principle, to specify which sort of changes a perdurant person may undergo and still survive in a strong and metaphysical sense. I say “at least in principle” since there are some evident problems related to the identification of a phenomenal continuity among temporal parts “from the outside”, i.e. from a point of view which is external to the stream of consciousness itself. The question is: how can we know that two experiences, both external to our stream of consciousness, are phenomenally continuous? If the phenomenal continuity among experiences is something we can evaluate subjectively, but not objectively, our knowledge of compositional facts of temporal parts of persons appears limited to our stream of consciousness. Still, this is not the place to resolve such a complex issue. Although I agree this is a problem for the epistemology of personal persistence, I think we may set it aside as far as an answer to the epistemological question “can we know whether x and y compose P?” should be presupposed in order to answer the metaphysical question about “what does it take for x and y to compose P?”. I would have more to say in elucidation of these points, but that will suffice as a specification of the problem.

A second advantage of phenomenal perdurantism is that it can avoid the argument from vagueness (cf. section 1.8.3.). To achieve this aim, phenomenal perdurantists – who endorse a principle of restricted diachronic composition based on the phenomenal continuity between temporal parts – need to show that this restriction of composition is not vague, and hence that it does not lead to cases in which it is vague whether composition occurs. I argue that a phenomenal perdurantist can do that by rejecting the graduality of phenomenal continuity, as vagueness does not obtain if either some temporal parts’ experiences belong to the same stream of consciousness or they do not – any middle ground being excluded. As far as I know, however, the idea that phenomenal continuity admits no graduality is not that common within the contemporary debate. Consider for instance the phenomenal approach to personal persistence advanced by (Dainton and Bayne 2005). Recognizing a sort of depth of consciousness, they do accept that phenomenal continuity comes in degrees, and they are also aware that this may constitute a problem for their view, the so-called “depth problem of mental states”: how simple a stream of consciousness can become before it ceases to be a condition of persistence? Arguing that the depth problem does not concern just the phenomenal account, but rather any informative account of persistence (such as memories, beliefs, etc.), Dainton and Bayne conclude that the absence of a clear-cut boundary for stream of consciousness should not force us to reject a phenomenal view. Although this defense of phenomenal perdurantism is perfectly reasonable as far as we confront this view with other sorts of moderate accounts, as Dainton and Bayne seem to do by referring to

memories, believes, etc., it seems to miss the main point of the dialectic here, which concerns the comparison between the mainstream universalist perdurantism and some moderate alternatives. As the argument from vagueness constitutes no problem for universalist perdurantism, it follows that such a defense of phenomenal perdurantism cannot be satisfying when compared to the latter, resulting more like an admission of guilt of all (complex) moderate perdurantist views to the universalist ears. Still, some phenomenal perdurantists who are sympathetic to Dainton and Bayne's account of phenomenal continuity – that we may call “reductionist” for reasons that will be clear later – may reply that the source of vagueness here is just the semantic indeterminacy of our ordinary concept of person. Vagueness just results from the fact that our linguistic conventions do not settle the issue precisely when it comes to how much consciousness (or what kind of consciousness precisely) has to be there for a person to continue his or her existence. But if this is the case, then the price to be paid to avoid vagueness is the introduction of a conventional cut off in consciousness, in terms of a minimal level of consciousness which is necessary for phenomenal continuity. But if such a cut off is conventional, then diachronic composition of temporal parts into persons is conventional as well, and this means that personal persistence results conventional too. Since from a methodological point of view, I take the denial of conventionality of personal persistence as an essential advantage for any moderate perdurantism over the standard universalist perdurantism, I set aside the semantic solution to the problem of vagueness for it would lead us to renounce to a non-conventionalist account of persons.

Nonetheless, I think that a possible reply for phenomenal perdurantism to the argument from vagueness may consist in endorsing a different conception of phenomenal continuity, based on the introduction of some sort of primitive and non-reducible sense of the self, discussed in the recent literatures under the forms of “mineness”, or “for-me-ness”, or “first-person givenness”.⁴² I will refer to the perdurantist view which takes this sort of phenomenal continuity as the condition of diachronic composition of temporal parts into perdurant persons as *for-me-ness phenomenal perdurantism*. This is opposed to a *reductionist phenomenal perdurantism*, which conceives phenomenal continuity as the result of co-conscious experiences, without posing “an additional ingredient in the guise of mineness or for-me-ness” (Dainton 2016, 122). Although it properly rejects “mineness”/“for-me-ness” as a further component of experience, and hence might be defined eliminativist rather than reductionist, I say it is reductionist for it reduces the fundamental character of phenomenal continuity, i.e. the sense of the self, to the interaction of several elements which compose our psychological background: the sense of the self is nothing but the “inner background”⁴³ of a person, in

⁴² See among others (Zahavi 2005), (Nida-Rümelin 2014), and (Zahavi and Kriegel 2015). Although it would be interesting to analyze which account of the sense of the self may serve better to a phenomenal perdurantism, I leave this enquire for another time.

⁴³ (Dainton 2016, 122ff).

which several elements interact. In other words, the reductionist feature of this sort of phenomenal perdurantism rests upon the idea that the sense of self, which grounds phenomenal continuity, is “largely the resultant of the various specific forms of experience which jointly constitute the inner component of the phenomenal background: bodily sense-fields, conscious thinking, emotional feelings, mental images and mental acts of various kinds” (Dainton 2016, 124). My claim is that a for-me-ness phenomenal perdurantism offers a reply to the argument from vagueness, since it takes phenomenal continuity as based on some primitive and non-reducible component (namely mineness/for-me-ness), which does not admit degrees. The reply to the argument from vagueness may go as follows. According to a for-me-ness phenomenal perdurantism, there are facts about for-me-ness and they are constitutive of diachronic composition (i.e. if two successive temporal parts exemplify the same for-me-ness, then they are parts of the same perdurant). Provided that for-me-ness is non-reducible, it is plausible to think that it does not admit degrees, so that either the same for-me-ness is exemplified at two different times, or it is not. It follows that facts about for-me-ness are not ontologically (nor semantically) vague. Then, it follows that according to for-me-ness phenomenal perdurantism personal persistence is not ontologically (nor semantically) vague.⁴⁴ One may be worried, however, that a for-me-ness phenomenal perdurantism may suffer the same problems of brute perdurantism, being a non-informative account of personal persistence. I personally do not think so, since it does admit of an informative condition of diachronic composition of temporal parts, and hence provides an answer to the diachronic composition question. As a matter of fact, phenomenal continuity is according to both for-me-ness phenomenal perdurantism and reductionist phenomenal perdurantism the constitutive condition of the personal persistence, the difference of these two positions concerning rather the account they give of phenomenal continuity (purely perspectival for the former, reducible to a sort of “inner background”⁴⁵ for the latter). Maybe some may argue that informativity as well is a matter of degree, so that a for-me-ness phenomenal perdurantism of personal persistence is less informative than a reductionist phenomenal perdurantism of personal persistence, since the latter can tell us more about phenomenal continuity. I take this point, and I agree one has the philosophical right to evaluate what kind of phenomenal perdurantism (if any) ought to be preferred also on the bases of the quality of information it is able to convey.

⁴⁴ If so, one may wonder why there are so many cases in which we don’t know whether personal persistence occurs. A reasonable way out for phenomenal perdurantism may be to accept that borderline cases of persistence are cases in which vagueness is epistemic: our knowledge is vague in the sense that we do not know what to answer, although vagueness is not into the world. As epistemic vagueness is not very popular nowadays – (Williamson 1994) is an important exception – it may be a further cost for phenomenal perdurantists who want to bite the bullet on that. [I’m grateful to Giuliano Torrengo for pointing that out to me].

⁴⁵ (Dainton 2016, 122ff).

A further advantage of a phenomenal perdurantism is that it offers a solution to the most discussed argument against any mentalist accounts of personal persistence, namely the too-many thinkers argument advanced by Olson.⁴⁶ In a nutshell, the argument goes as follows:

1. According to mentalist accounts, mental continuity is a necessary and sufficient condition for personal persistence. (Assumption)
2. If mental continuity is a necessary and sufficient condition for personal persistence, then mentalist approaches of personal persistence rule out our being organisms. (Assumption)
3. Persons are thinking beings, but not organisms. (1, 2)
4. A healthy, adult human organism seems a paradigm case of a thinking being. (Assumption)
5. We ought to distinguish an organism that thinks, and something that is a person but not an organism. (3, 4)

Three problems are usually recognized from this conclusion. i) The first one is the multiplication of thinking beings which are co-located: given 5., mentalist accounts of persistence would commit us to the existence of two intelligent beings under our skin: a person and a human organism. ii) The second problem is epistemic and concerns the indeterminacy between two entities. The organism seems to be psychologically indistinguishable from the person. But then, how can be aware of the fact that the person and not the organism is thinking now? In fact, if both are thinking beings, it seems difficult to distinguish the cases in which the person is thinking and the cases in which the organism is thinking. How can we explain this distinction? iii) The third problem emerges from the commitment to different persistence conditions for different kinds of persons. If organisms are psychologically indistinguishable from persons, then they are thinkers and their thoughts are complex and sophisticated as the one of the alleged non-animal person. But if this is the case, then they are persons as well: they are human animal persons. It follows that we ought to recognize two persons with different conditions of persistence: an animal person with physical conditions of persistence, and a non-animal person with mental conditions of persistence. If this is the case, at least some persons (i.e. the animal persons) result having some physical conditions of persistence, which is in contrast with any mentalist accounts.

Since the literature on this issue is quite extensive and since my purpose here is just to point out an advantage of phenomenal perdurantism over other forms of mentalist perdurantism (i.e. the psychological perdurantism), I shall not attempt a full discussion of

⁴⁶ See in particular (Olson 1997a, 80ff, 100–109, 2016, sec. 6) and (Snowdon 2014).

the too-many-thinkers argument.⁴⁷ What I want to argue is just that a phenomenal perdurantism is able to avoid the problematic consequences of the too-many-thinkers argument while accepting its premises and conclusions. This is possible in virtue of the specific mental relation recognized by phenomenal perdurantism as constitutive of the diachronic composition of temporal parts into a single person, namely the phenomenal continuity of experiences within a stream of consciousness. Suppose we accept all premises of the argument, and hence also premise 4), which says that human organisms are paradigm cases of thinking beings.

Does it commit us to say that human organisms have phenomenally continuous experiences? I claim it does not. Even accepting that human organisms have some mental states, as well as first-personal thoughts, there is no reason to think that the human animal as well has a phenomenal experience of such mental states and first-personal thoughts. If so, phenomenal perdurantism may offer a way to avoid the problematic consequences of the too-many thinkers argument since i) it avoids the coincidence of thinking beings, provided that persons are the only entities composed by temporal parts which are phenomenally continuous; ii) it solves the indeterminacy problem arguing that phenomenal experiences only concern persons, not organisms; iii) it denies the multiplicity of persons, since just persons persist in virtue of phenomenal continuity among temporal parts.

Despite the advantages of phenomenal perdurantism, I see several objections that may be raised about it.

First of all, one may be worried by the fact that phenomenal perdurantism is committed to a form of essentialism about personal persistence, according to which only temporal parts which instantiate the kind person compose a perdurant person (see section 1.1. above for criticisms against essentialism). One may reply that the charge of essentialism depends on the way we conceive consciousness and the phenomenal continuity of experiences. If phenomenal continuity of experiences is based on first personal thoughts

⁴⁷ Besides the phenomenal account of persistence, I see two other ways a mentalist advocate might follow to avoid the worrisome consequences of the too-many thinkers problem. The first one is to argue that even human organisms have psychological persistence conditions. It would follow that in cases like a brain transplant, it is not true that the brain is removed from the organism. On the contrary, the operation would cut an organism down the size of the brain and move it into another body (which is not an organism) – see (McDowell 1997). Although this solution is able to avoid a plurality of persistence conditions for persons, it is not clear how it can be justified, nor how it can solve the other worries. Another possible solution to the too-many-thinkers argument may be to reject premise 4), claiming that organisms do not think; only persons do. However, this solution rests upon the denial of what appears an evident common-sense truth, so that it has the burden of the proof to deny 4). I mention these solutions only to set them aside. A further strategy, which is probably the most similar one to the phenomenal account, has been advanced by (Noonan 2012), based on the distinction between “thinkers of first-person thoughts” and “objects of first-person reference”. Persons and only persons are objects of first-person reference. Reasons of space force me to leave the discussion on the relations between my phenomenal view and Noonan’s first-personal approach for another occasion.

and first personal thoughts are necessarily personal – as argued by (Campbell 1992), then phenomenal perdurantism is committed to essentialism about persistence. But if we suppose that first-personal thoughts are not necessarily personal, then the concept of person is not necessarily involved in one’s stream of consciousness. This is, for instance, the position defended by Velleman, who claims that “creatures who lack the concept of a person can nevertheless manifest behavior that is to be explained by their having egocentric representations of their surroundings – representations whose content cannot be expressed without the help of first-person pronouns” (Velleman 1996, 51). Take for instance a cat: in order to explain its behavior while hunting a mouse, we need to refer to the cat attributing first-personal thoughts to itself, like ‘There is a mouse in front of me’. Still, such an attribution of first-personal thoughts does not entail that the cat is thinking of itself as a person. The charge of essentialism against phenomenal perdurantism is hence avoided.

A further objection against a phenomenal perdurantism may rest upon a sort of Parfitian distinction between issues on survival and issues on persistence understood as identity over time (see section 1.1. above). We saw that phenomenal continuity of temporal parts is a mental relation, which holds between temporal parts whose experiences belong to one and the same stream of consciousness. But as a mental relation, one may argue, it should be distinguished from any metaphysical relation, such as the relation of diachronic composition of temporal parts, and it should be distinguished from the relation of persistence. This is more or less what Velleman has in mind when he suggests to distinguish the question about our future concern (which is “what matters for survival”) and the question about personal identity over time.⁴⁸ According to this latter, to say that personal identity depends on perspectival selfhood is to make a substantive philosophical claim; but this claim is based on the conflation of metaphysical and perspectival notions, which cannot be taken for granted. Although he points out Locke’s memory theory as a paradigmatic example in which an account of perspectival selfhood has been mistaken for personal identity (Velleman 1996, 65), I think that the same line of reasoning can be applied to phenomenal continuity. It would follow that even accepting that a phenomenal continuity is essential to evaluate our concern for the future, it does not tell us anything about our persistence, and then about the way diachronic

⁴⁸ “To wonder how much of the future I can anticipate experiencing is just to wonder how far into the future there will be experiences that I am now in a position to prefigure first-personally. If this question truly expresses what I want to know about my survival, then what I want to know is a matter of perspective rather than metaphysics. My question is not how long there will be an individual identical with my present self, DV. My question is how long there will be someone to occupy the position that is the center of my self-centered projections-someone to serve as the referent of “me” as it occurs in my prospective thoughts. The future “me” whose existence matters here is picked out precisely by his owning a point of view into which I am attempting to project my representations of the future, just as a past “me” can be picked out by his having owned the point of view from which I have recovered representations of the past.” (Velleman 1996, 68)

composition of temporal parts occurs. As I already claimed in section 1.1., although I agree that it is a substantial philosophical issue whether we should identify some sort of continuity of selfhood (such as the phenomenal continuity of experiences defended by a phenomenal account) with personal identity over time, it does not mean we should give it up. In other words, the fact that this identification is not necessary, as Velleman argues by pointing out that self-concern and identity over times are two distinguished issues, does not entail we need to reject it. Rather, it shows that a phenomenal perdurantism – and more in general any phenomenal account of personal persistence – as a theory of personal persistence is viable as far as issues on future concern and issues on persistence are not taken apart, which is methodologically in line with the assumption I made in the very first part of my work (see section 1.1.).

A further objection against phenomenal perdurantism rests upon the so called “bridge-problem of consciousness”: how can a phenomenal approach to personal persistence account for cases in which two streams of consciousness are not phenomenally continuous? If phenomenal continuity is the necessary and sufficient condition for personal persistence (i.e. for diachronic composition of temporal parts within a perdurantist framework), x at t is not the same as y at t^* if x 's experiences at t and y 's experiences at t^* are not continuous. But such a request appears too strict. Utterly ordinary gaps in consciousness – such as those occurring when we go to sleep – are clearly *not* cases of interruption of persistence. And thus, if phenomenal perdurantism entailed that we die each time that we go to sleep and a new person is born when we wake up, it would be enough to reject it. In defense of a phenomenal account, one may articulate some further conditions which may account for streams of consciousness which are not phenomenally continuous, namely which have gaps within them. Given phenomenal perdurantism, this would justify cases in which temporal parts which are not phenomenally continuous still constitute one and the same perdurant person. Take for instance the constructivist solution to the bridge-problem based on the notion of capacities advanced in (Dainton and Bayne 2005) and then defended in (Dainton 2016).⁴⁹ According to this view the unity of a discontinuous stream of consciousness is based on the persistence of capacities for a unified consciousness, where these capacities do not need to be exercised.⁵⁰ It follows that cases of interruptions in consciousness (such as

⁴⁹ On the distinction between “constructivist” and “non-constructivist” solutions to the bridge problem (roughly, solutions that try to construct a bridge and solutions that do not, respectively) see (Dainton and Bayne 2005, 562ff), where they explore different kinds of constructivist solutions. For a conventionalist constructivist solution about inter-streamal survival see among others (Braddon-Mitchell and Miller 2004). For a non-constructivist solution, see (G. Strawson 1997).

⁵⁰ “Rather than regarding persons as primarily things that *are* conscious, we regard them as things that *are capable* of being conscious, as beings that possess *capacities* for experience. A typical human person possesses a vast range of experiential capacities, only a few of which are active at any one time. When a person becomes unconscious, none of their experiential capacities are active, but the capacities nonetheless remain in existence: the irretrievable loss of the capacity for consciousness is what

sleeping, or fainting) are not cases of disruption of personal identity, as far as the capacities for experience persist: capacities really are what matters for persistence. Applied to temporal parts and the constitution of the perdurant persons, the assumption of capacities allows for temporal parts which are not phenomenally continuous to be constitutive of a unified perdurant, so that diachronic composition of temporal parts into a perdurant person obtains if and only if either temporal parts are phenomenally continuous or they have capacities for such a phenomenal continuous experience. My primary interest in here is not so much in convincing anyone that the capacities solution is the best solution to the bridge problem, as in using it to show a possible way for phenomenal perdurantism in accounting for cases of interruption of phenomenal continuity.

Finally, one might reject phenomenal perdurantism by pointing out a contradiction which seems to follow the common assumption that in an experience of change we seem to persist through the experienced episode of change.⁵¹ Given perdurantism about the self, in fact, the self represented in each slice of one's experience is nothing but a momentary temporal part of that person. But this is in contrast with the assumption above, namely that in an experience of change we seem to persist through change, and hence that *the same self* persists through change. If this is the case, then our experience turns out to be illusory. However, if our experience is illusory, advocates of phenomenal perdurantists should give up another fundamental assumption, namely that phenomenally continuous experiences track the self as it really is. And if phenomenally continuous experiences cannot track the self over time, then phenomenal perdurantism itself would lose most of its appeal: why should we endorse phenomenal perdurantism if it cannot track the self as it really is? I think that a possible defense of phenomenal perdurantism may consist in arguing in favor of top-down version of perdurantism (see section 2.2. above) and more specifically on a topdown version of the perduring self. According to this account the perduring self is temporally extended and is more fundamental than its temporal parts, which are nothing but abstractions of momentary states of the extended self. As abstractions of momentary states of the extended self, one may argue that such temporal parts lack of any experiences or thoughts, and hence what we experience when we experience change is the same persisting subject, rather than the temporal parts. This means that the representation of the same persisting subject that we have through our momentary slices is correct, and hence the experience of change cannot be charged of being illusory.

differentiates being merely unconscious from being dead. [...] From this new perspective, defining personal persistence conditions in experiential terms looks to be comparatively straightforward: we can trace the persistence of a person by reference to the existence and persistence of capacities for a unified consciousness, capacities that are sometimes exercised, sometimes not" (Dainton and Bayne 2005, 565).

⁵¹ I'm indebted to Thomas Sattig for advancing this possible objection and reply.

3.4. Quinean Perdurantism

In the first part of this chapter, I showed how according to Heller any non-liberal account of composition (and hence a fortiori of diachronic composition) requires “some natural constraints on objecthood” to avoid conventionality (Heller 1990, 51): this means that only the assumption of some natural (i.e. “joint-caving”) relation among temporal parts could allow us to avoid the commitment to a principle of unrestricted composition, and then to the idea that ‘how things persist’ is a conventional matter. Without any such natural relations among temporal parts, any restriction of diachronic composition would result in contrast necessarily conventional. And then any sort of moderate perdurantism would result conventional and metaphysically doubtful as well – which is, in fact, a good consequence for universalists like Heller.

In this section I shall consider a possible counter-example to Heller’s view, namely a form of perdurantism which avoids conventionalism of persistence without being committed to the existence of constraints on objecthood which are carved out by nature. For reasons that will become clearer in what follows, I will call this view *Quinean perdurantism*.⁵²

3.4.1. Non-natural (but still objective) persistence

I label “Quinean perdurantism” a perdurantist account of personal persistence which is essentially relativistic and consistent with a multiplicity of conditions of diachronic composition for perdurant entities, based on the multiplicity of systems of reference. In a nutshell, the answer to the diachronic composition question given by what I call Quinean perdurantism would be “*it depends*”, and more precisely “*it depends on the conceptual system of reference*”. Although this answer may sound as easy as disappointing at first sight, let me ask to be patient and suspend the judgement just for one moment, so I can explain what I mean with that.

First of all, I should be very clear that the Quinean flavor of what I call “Quinean perdurantism” rests upon a non-standard interpretation of Quine’s philosophy, and in particular of Quine’s metaphysics as essentially characterized by ontological relativity – cf. (Quine 1961, 1950, 1960, 1969, 1976). However, as Quine’s philosophy concerns a large amount of interconnected doctrines (such as the thesis of indeterminacy of

⁵² Some of this material I presented first in 2017, at the University of Neuchâtel during the *1st Eidos Graduate School in Metaphysics on IDENTITY* organized by *Eidos, the centre for metaphysics*: to its members as well as the participants of the winter school I am indebted for many stimulating discussions (I am grateful in particular to Claudio Calosi, Fabrice Correia, Ghislain Guigon, Robert Michaels, Thomas Sattig, and Alex Skiles).

translation, the rejection of conventionalism and of linguistic doctrine of logical and mathematical truths, the thesis of inscrutability of reference, and so on), my appeal to a Quinean perdurantism as a form of perdurantism based on ontological relativity results at the end of the day absolutely partial and incomplete.⁵³ What is more, as pointed out by (Becker 2012, 158), ontological relativity is probably the doctrine which generates “some of the most difficult questions in the interpretation of Quine’s philosophy”, so that the partiality of my account turns out to be even higher. Let me add that among the viable interpretations of Quine’s ontological relativity, I consider ontological relativity as a form of “existential relativity of entities to systems of reference”, e.g. to different theories (I will explain that more in detail below). Even in this case, I shall be honest, and say that it is not the common understanding of Quinean ontological relativity, and for this reason I do not pretend my interpretation to be conclusive nor to be the best one on the market. For all these reasons, I imagine some readers finding themselves between the Scylla of rejecting my interpretation of Quine as completely misleading, and the Charybdis of finding it partial and arbitrary but still theoretically interesting, in particular when applied to personal persistence. As I hope some may opt for the second, I will take the risk of knowing some will go for the first option. Finally, since I am not aiming at any careful exegesis of Quine’s philosophy, the reader is free to think of these aspects of a formal definition of Quinean, or even to substitute all occurrences of ‘Quinean’ with a ‘Quinean*’. This will be fine, as my aim here is to take a cue from some aspects of Quine’s philosophy, interpreted in a certain way, so to provide an account of personal persistence which is not necessarily (and probably not even likely) the one Quine would have endorsed. After this long but I think indispensable methodological clarification, let us go back to Quinean perdurantism and its ontological relativity.

The ontological relativity in Quine’s philosophy arises from two fundamental premises, namely i) the fact that ontology is defined by the values admitted as quantified variables – cf. (Quine 1961, 8–9); ii) the fact that different systems of reference yield (or assign) different values as quantified variables. Ontological relativity (in the specific interpretation explained above) works on the existential level somehow similarly to the relativity doctrine of space: as according to this latter there are no absolute positions nor absolute speeds, but relations among systems of coordinates, in the same way given ontological relativity there are no objects which exist in an absolute sense, independently from any theory. The things in the world are rather the things emerging from a certain

⁵³ For the analysis of ontological relativity as a central aspect in Quine’s philosophy, as well as for the specific interpretation of Quinean ontological relativity in relation to Kantian transcendentalism (in particular in the forms defended by neo-Kantianists like (Cohen 1871; Cassirer 1910)), and then to the relativity to inertial systems in physics, I am deeply indebted to Paolo Valore, whose reading of Quine’s ontology is mostly the one I have been embracing since my undergraduate studies – cf. (Valore 2016), and in particular the Appendix *Relativism and Ontological Relativity*. Still, any inaccuracy on these issues is likely to be mine rather than his.

interpretation of a theory.⁵⁴ They are theory-dependent, so that we can talk about them only relatively to a certain theory. This means that things are not “ready into the world”, such as something out there we can meet or discover; rather things are assumed on the bases of the relation we have with the world through some specific (scientific) theory. One consequence of this view is that we cannot deal with things of other theories unless we define a further theory under which we interpret the first one. By denying any form of absolute reality, this view may account for a plurality of ontologies which are relative to different theories, provided that we are willing to accept a plurality of true theories⁵⁵. Thus, along with ontological relativity I will take a Quinean approach as committed to a form of unreducible ontological pluralism as well, according to which there is no unique objectively privileged ontology. Quinean perdurantism is so consistent with a plurality of conditions for diachronic composition of temporal parts into perdurants, provided that any determinate condition of diachronic composition obtains within a certain conceptual framework and that there are different frameworks, pointing out different conditions of diachronic composition of temporal parts. Quinean perdurantism can be then defined as follows:

⁵⁴ Quine’s introduction of ontological relativity is strictly connected with his theory of the inscrutability of reference – cf. (Quine 1960, chap. 2) – where he discussed a case of translation from an unknown language. In a nutshell, the theory of the inscrutability of reference claims that “it is indeterminate what objects the singular terms, pronouns and bound variables of our true sentences refer to.” (Stroud 1990, 322). Endorsing this theory Quine aimed at showing the falsity of the so called “myth of the museum”, according to which objects are given and what we have to do is just to label them, so that the translation from one language to another would be possible in virtue of some change of labels we attach to those objects. Quine rejects this view, and argues that any translation remains indeterminate, since we cannot pass from one language to another without modifying the things themselves. A further issue concerns whether ontological conversion from one theory to another one is possible. Any translation rests upon the definition of some class of objects of a certain theory T1 in terms of some class of objects of a different theory T2. However, in order to obtain, we need to presuppose some projection functions which allow to project the universe of the first theory (T1) into the universe of the second theory (T2). On this issue, as well as on Quine’s theory of indeterminacy of translation, see (Becker 2012, chap. 3 and 4). For reasons of space, I will set these issues aside.

⁵⁵ Three things are worth point out. First, a true theory is not to be intended here as a theory which is true *simpliciter*, as it may lead to very problematic consequences (suppose two theories are not compatible. If they are both true simpliciter, does it follow that there are contradictions into the world? What kind of logic should we use in this case?). Rather, with “true theory” I mean a theory which is viable and it is true *within its system*. Second, one may wonder whether the plurality of systems of reference I refer to concerns a plurality of subject matters (e.g. physics, chemistry, biology, psychology, economics, etc.) or rather a plurality of theories even within the same subject (e.g. quantum mechanics, special relativity, field theory, theory of strings etc. in physics; cell theory, theory of evolution by natural selection, system biology etc. in biology, and so on). Although I tend towards the latter, in what follows I will stay neutral on that. Third, I notice that the mainstream physicalist interpretation of Quine’s philosophy may disagree with that, since according to Quine there is only one true theory, namely physics. It follows that no ontological pluralism obtains. However, for the reasons I pointed out above, I do not aim at framing Quine’s view, being rather more interested in developing some Quinean issues regardless of his precise view on such topics.

QUINEAN PERDURANTISM: Given various times and various temporal parts existing at each, and given a certain system of reference S , there is a minimal D-fusion of those temporal parts at those times, iff they are Φ -related and Φ is a composition relation in the system of reference S .

And applied to personal persistence:

QUINEAN PERDURANTISM OF PERSONAL PERSISTENCE: Given various times and various temporal parts existing at each, and given a certain system of reference S , there is a minimal D-fusion of those temporal parts at those times, and this fusion is a person, iff they are Φ -related and Φ is a composition relation for persons in the system of reference S .

Although this solution may appear nothing but a different formulation of Lewisian reduction of personal persistence to a semantic matter, the difference between a standard Lewisian perdurantism and a Quinean one is substantial, and emerges as soon as we specify the difference between what I label a “system of reference” and what is meant to be a Lewisian “context of reference”. I imagine some may find disputable the way I use these two terms, preferring maybe some different labels for the notions I am going to consider. I have no problem with that as far as the substitutive labels let us catch the differences I’m going to draw. I use “system of reference”, as characteristic of the Quinean approach in a strong and metaphysical sense, as the conceptual framework(s) in which things are given, and in opposition to the uncommitted notion of “context of reference” used by Lewis. According to Lewis, a context of reference is nothing but the set of parameters whose variation entails the variation of the intension and the extension of an expression, which are the two notions he uses to analyze the meaning of an expressions, such as ‘person’. More specifically, Lewis considers context-dependent conditions of diachronic composition of temporal parts in terms of conditions which are based on a particular relation of similarity, namely a similarity ‘qua certain features’ (where the relevant features are the ones sensitive to the contextually salient aims and interests). On the other hand, a system of reference is something ontologically more substantial than a context of discourse: it is *the conceptual framework in which things are given*.⁵⁶ Such an account of system of reference leads back to a specific meta-ontological approach, which is based on a fundamental ontological relativity – according to which, as

⁵⁶ I shall admit that in some passages Quine’s account seems more in line with a semantic reduction of the problem of persistence, such as in (Quine 1981, 12): “There are no questions about the nature of [personal] identity. They are questions about how we might best construe the term ‘person’.” One may suppose this is connected with the fact that “on a number of important points Quine has changed his mind” (Becker 2012, x); it is significant, for instance, that in his *Things and Their Places in Theories* (Quine 1981, chap. 1), Quine does not use the term ontological relativity at all. I shall not take view on this point, since as I said, I do not aim to an historical interpretation of Quine’s view.

argued above, everything is given within a system of reference, while nothing is framework-independent.

Quinean perdurantism is not committed to the existence of any sort of natural or joint carving relations among temporal parts which are constitutive of diachronic composition, and hence of the persistence of perdurants; as the constitutive relations of diachronic composition among temporal parts are relative to some system of reference, so it is the persistence of perdurants. Nonetheless, I argue that a Quinean perdurantism is not committed to a conventional account of persistence and then of personal persistence. This would offer a counterexample to Heller's view that the only way to avoid the fusion principle (and then the conventionality of perdurants persistence) is to account for some natural constraints on composition – and hence that the non-naturalness of compositional relations among temporal parts entails the conventionality of such relations. To achieve my aim, I shall argue that Heller's view rests upon a too strong account of conventionality (e.g. in terms of "mind-" or "theory-dependence", opposed to "absoluteness" and "reality"), which leads to a disputable opposition between conventionality and naturalness. However, if we accept a weaker account of conventionality (e.g. in terms of "arbitrariness" or "lack of objectivity"), it is reasonable to accept some accounts which are non-conventional although non-natural, such as the Quinean perdurantist approach. If so, a Quinean perdurantism is able to account for a form of objectivity which is not committed to the existence of any joint-carving relations of diachronic composition among temporal parts.

But what are the system of reference we ought to consider when dealing with diachronic composition of temporal parts, and hence the composition of temporal parts of persons? As according to Quine, the role of ontology is to let emerge the entities embedded in *our best scientific theories*,⁵⁷ a better definition of a Quinean perdurantism, and then of a Quinean perdurantism for personal persistence, may go as follows:

QUINEAN PERDURANTISM (II): Given various times and various temporal parts existing at each, and let *T* be one of our best scientific theories, there is a minimal D-fusion of those temporal parts at those times, iff they are Φ -related and Φ is a composition relation according to *T*.

QUINEAN PERDURANTISM OF PERSONAL PERSISTENCE (II): Given various times and various temporal parts existing at each, and let *T* be one of our best scientific theories, there is a minimal D-fusion of those temporal parts at those times, and this fusion is a person, iff they are Φ -related and Φ is a composition relation for persons according to *T*.

⁵⁷ A similar account has been recently defended by (Hawley 2006, 465): "metaphysical beliefs, like other beliefs, should be empirically adequate, and contemporary science is our best guide to empirical adequacy."

To provide an answer to the diachronic composition question, a Quinean perdurantism would hence invite us to consider our best scientific theories, which are the systems of reference we should privilege.

If we define a Quinean perdurantism in these terms, it is worth pointing out the main difference between this view and the nomological perdurantism introduced above (section 3.2.). As far as nomological perdurantism is understood in terms of a realist account of the laws of nature, it is also realist on the diachronic composition of perdurant entities and their existence. The persistence of perdurant entities results disconnected from any relativity to system of reference or scientific theory, as the latter provides us with nothing but epistemic conditions of persistence: things persist in virtue of the laws of nature connecting temporal parts into perdurant individuals, which are theory-independent. In contrast, a Quinean perdurantism is not a realist account of persistence, although it is objective and not arbitrary. This explains how the difference between a nomological perdurantism and a Quinean perdurantism does not reduce to the fact that the latter (but not the former) embraces a plurality of systems of reference/theories. As a matter of fact, even if Quinean perdurantism would accept just one theory, it would not collapse into nomological perdurantism, since the diachronic composition of temporal parts would remain relative to that system, and not independent from it.⁵⁸

Nonetheless, there is also a significant aspect which unifies the two views, and concerns their deep relation with scientific theories, so that both may be characterized as kinds of “naturalized perdurantism”. Although this may sound in contrast with the denial of natural relations among temporal parts, I think the contrast is only apparent. A Quinean perdurantism does deny natural conditions of diachronic composition of temporal parts as far as they are intended as “absolute” or “join-carving” relations among those parts. But it is “naturalized” as far as its conclusions are based on our best scientific theories. It is naturalized as metaphysics is naturalized according to (Chakravartty 2013, 33), who claims as follows:

“Naturalized metaphysics is a metaphysics which is inspired by and constrained by the output of our best sciences... naturalized metaphysics, in virtue of its scientific starting point and context, is conceived as being susceptible and sensitive to empirical concerns.”

Now, one may wonder which one among the Quinean and the nomological perdurantism is the most naturalized perdurantist approach. I guess that to answer this question we should first of all define naturalism. There are in fact several ways in fact we could classify

⁵⁸ In discussing the conventionalist and the realist approaches to temporal metrics, (Torrengo 2015) (who defends an objectivist position on the ground of its explanatory force) makes an analogous point.

naturalism⁵⁹: naturalism as a methodological doctrine (e.g. (Ladyman and Ross 2007), (French and McKenzie 2011)), naturalism as a metaphysical doctrine (e.g. (Morganti and Tahko 2017)), and naturalism as an epistemological doctrine (e.g. (Hawley 2006), (Ney 2012), (Chakravartty 2013)). If this is correct, I would say that Quinean perdurantism is the most naturalized perdurantism as far as naturalism is conceived as an epistemological doctrine (according to which metaphysicians should seek theories which cohere well with our best theories in the natural sciences)⁶⁰, whereas nomological perdurantism is the most naturalized perdurantism as far as we conceive naturalism as a metaphysical doctrine (according to which some elements of science are prior to metaphysics in that science “gathers the indicators coming from the actual world that are necessary for fleshing out the various metaphysical hypotheses and selecting the most appropriate (i.e. informative, explanatory, simple etc. but also likely to be true) among them” (Morganti and Tahko 2017, 24)).

3.4.2. Advantages of Quinean perdurantism and some objections.

Having discussed the possibility of a non-liberal account of personal persistence which is not committed to some sort of natural relations among temporal parts, let us now wonder what are the advantages (if any) of such a moderate perdurantist approach.

First of all, a Quinean perdurantism may offer a solution to the two main worries of a liberal perdurantism, namely i) the problem of the many and ii) the problem of conventionality (cf. section 1.8.3. above). i) On the one hand it may avoid the problem of the many by rejecting the commitment to an overpopulated world in which any set of temporal parts compose a perdurant object: perdurant objects are all and only the fusions of temporal parts which are related by a conditions of diachronic composition which obtains within a certain system of reference. The distinction between robust four-dimensional objects and mere sums of temporal parts is then based on the fact that the former but not the latter are unified in virtue of some relations which are constitutive of diachronic composition of temporal parts. However, one may suspect that such a perdurantist account does not really avoid the overpopulation of the world, since the multiplicity of systems of reference does entail a multiplicity of perdurants and then of perdurant persons, as Quinean perdurantists seem to admit as well. The world would result, in this light, as a big and well served store, in which a huge quantity of perdurant

⁵⁹ This view, or something like it, was presented by Alasdair Wilson in a talk entitled “Three Grades of Naturalistic Involvement” at the SMS 2018, at the University of Milan in August 2018. I am describing it here from memory, so any incoherence or inaccuracy in the view as described here is likely to be mine rather than Wilson’s.

⁶⁰ (Roth 1984) argues that the naturalization of epistemology constitutes the most innovative aspect of Quine’s philosophy.

persons are available to our choice. Still, this is a mistaken understanding of a Quinean perdurantism, which rests upon an alleged “view from nowhere” from which one is supposed to look at all systems at the same time, and in which perdurant persons of all systems of reference are offered all together. But this is against ontological relativity, as I defined it in the previous section (3.4.1.). Although it is true that a Quinean perdurantism is consistent with a plurality of perdurant persons, which rests upon the plurality of systems of reference we adopt to define what there is, that does not entail any kind of overpopulation of continuants. Given a determinate system of reference, exactly some specific condition of diachronic composition of temporal parts obtains, so that some specific perdurant objects (and among them some specific perdurant persons) emerge. Besides preventing the overpopulation of perdurants, a Quinean perdurantism is also able to reject any commitment towards bizarre and gerrymandered entities, such as the “contacti persons” imagined by Hirsh⁶¹ as follows:

“Suppose that A and B are two people who come into physical contact with each other (say, they shake hands). Then in the new language the term “person” will denote neither A nor B, as ordinarily conceived, but will denote instead two individuals A' and B' who stand to A and B in the following sort of way. The history of A' will contain all the stages of A's history during periods when A is not touching another person, together with the stage of B's history during the period when A and B touch; correlatively, the history of B' will contain all the stages of B's history during periods when B is not touching another person, together with the stage of A's history during the period when A and B touch.”(Hirsch 1982, 287)

Thus, a Quinean perdurantism can easily avoid any commitment towards this sort of entities in virtue of the fact that the constitutive conditions of diachronic composition for contacti persons cannot be derived by any plausible scientific theory (at least as far as we know), and hence cannot be the constitutive condition of personal persistence.

ii) On the other hand, it avoids conventionalism, for it denies the reduction of the persistence question to a matter of linguistic decision. This is because, as I explained in the previous section, a Quinean perdurantism can provide an answer to the diachronic composition question not in terms of relativity to certain features (which are selected on the bases of some linguistic choice), but rather in terms of relativity to a determinate system of reference. To shed some light on this point, it is useful to see how a Quinean relative identity differs from a standard theory of relative identity, usually associated to the theory of sortals advanced by Geach – cf. (Geach 1967, 1973, 1980). Roughly, according to the theory of relative identity questions such as ‘is *a* identical to *b*?’ cannot have an answer; this is because any identity question needs to be completed with a

⁶¹ On “contacti identity relation” and “contacti persons”, criticized as some awkward consequences of taking identity over time as a matter of diachronic composition of temporal parts, see (Hirsch 1982, chap. 10).

concept of a kind of thing, a so-called sortal concept *F*, taking the form “is *a* the same *F* as *b*?”. Differently, Quine’s account of identity results a matter of identification within “a given discourse”, where a “discourse” should be here intended in a loaded sense as the conceptual framework of a (scientific) theory.

“Objects indistinguishable from one another within the terms of a given discourse should be construed as identical for that discourse. [...] Our maxim of identification of indiscernibles is relative to a discourse, and hence vague in so far as the cleavage between discourses is vague.” (Quine 1950, 626)

So, although *prima facie* a Quinean account may seem to share some features with a theory of relative identity as formulated by Geach, I think the two accounts are different, as also Quine himself pointed out:

“My point is strangely reminiscent of Geach's contention that "it makes no sense to judge whether *x* and *y* are 'the same' . . . unless we add or understand some general term 'the same *F*'" [...] I say "strangely" because I disagree with Geach; I insist that *x* and *y* are the same *F* if and only if *x* and *y* are the same, outright, and *Fx*. Cross-moment identification is another thing; the momentary objects *x* and *y* are unwaveringly distinct, but are time slices of perhaps the same *F* and different *G*s.” (Quine 1976, 860 fn. 2)

What I want to claim is that Quine’s identification within the terms of a given discourse does not imply a kind of relative (or sortal) identity, but properly identity for that discourse. Thus, even if personal persistence results necessarily relativized to some system of reference given Quinean perdurantism, personal identity turns out to be not-relative within that system. So, even referring to framework-dependent conditions of diachronic composition of temporal parts and then of conditions of persistence, Quine's characterization of relative identity may help us rejecting the charge of conventionality of personal persistence. As things stand, the difference between the conventionality of personal persistence in Quinean perdurantism and in Lewisian universalist perdurantism – which reduces the persistence question to the problem of specifying the meaning of the concept of ‘person’ – rests upon different ways in which personal identity is relative. On the one hand according to Lewisian perdurantism personal persistence is conventional for it is relative to some semantic constraints, such as the reference to a sortal; personal persistence is hence tantamount to the persistence of something “as a person”. On the other hand, personal persistence according to Quinean perdurantism is relative to a conceptual framework, but it is not-conventional, for it rests upon identity within that conceptual framework: it follows that personal persistence is tantamount to the persistence of a certain entity (namely a person) within a certain conceptual framework.

Provided that metaphysical theories are to be preferred if they are in line with the results of our best scientific theories, I guess that a further advantage of a Quinean perdurantism is that it rests upon our best scientific theories in order to answer the diachronic composition question. As according to Quine metaphysics is contained in our best scientific theories, Quinean perdurantism may be then understood as a form of scientific kind of perdurantism (or a “naturalized perdurantism”, as I explained above also in relation to another naturalized approach, namely nomological perdurantism). Of course, this advantage goes as far as one is willing to accept a scientific metaphysics, whereas it is disputable if one prefers a traditional metaphysics according to which metaphysics and science are mutually exclusive.⁶² In this case the relations that a Quinean perdurantism has with natural sciences may constitute no significant advantage for this view. However, referring to the distinction between metaphysics and science recognized by traditional metaphysics seems rather instrumental here, for such a traditional metaphysics is not compatible with a Quinean account in general. Thus, it does not constitute any specific problem for the advantage I was here considering, resting rather upon a denial of a Quinean scientific metaphysics.

There are, however, several objections that may be moved against a Quinean perdurantism.

The first one concerns the fact that it does seem able to avoid the argument from vagueness, and hence to avoid cases of vague composition over time (see section 1.8.1.). This is consequence of the fact that our best scientific theories seem to provide us with conditions of diachronic composition of temporal parts which are vague. Take for instance biology as the system of reference for Quinean perdurantism. Suppose that according to biology a reasonable condition of diachronic composition of temporal parts is the continuity of a biological life. Such a desideratum, namely the continuity of biological life is as intuitive as vague. And the same happens if we consider other systems of reference: take physics, and material continuity as a condition of diachronic composition of temporal parts within this system of reference. How much of material continuity is necessary and sufficient to be constitutive of diachronic composition of temporal parts? To avoid vagueness, and hence reply to this objection against a Quinean perdurantism one may argue that what is needed are just systems of reference which provide us with non-vague conditions of persistence (in terms of non-vague conditions of diachronic composition of temporal parts). Such claim is not obviously incoherent, but that gives us no reason to take it seriously. Moreover, it seems to betray the fundamental idea of a Quinean theory, namely that the conditions of diachronic composition are given by our best scientific theories, and that what are our best scientific theories is something that scientists (and not metaphysicians) should define. But asking for some new systems

⁶² This issue has been recently discussed by (Hawley 2006).

of reference which are not committed to vagueness in substitution to the ones we have appears as a metaphysical demand aimed at overturning this order.

A further worry for a Quinean perdurantism might come from the general problem of the *under-determination of metaphysics by scientific theories*. As French pointed out when dealing with the relation between metaphysical theories of identity and individuality on one hand, and quantum statistics on the other hand, there is “a problem for this programme of ‘reading metaphysics off current physics’” (French 1998, 93): the problem is that the properly scientific portions of theories like quantum mechanics seem to be compatible with a range of different metaphysical views, and thus do not point in one direction rather than another. More in general, the under-determination of metaphysics by scientific theories consists on the fact that sciences do not investigate the world without metaphysical assumptions, so that their findings cannot really play the role to distinguish among different metaphysical theories. Applied to the specific case of personal persistence in a Quinean perdurantist framework, this may lead to the problem of *under-determination of diachronic composition of temporal parts by scientific theories*: as properly scientific portions of theories can be compatible with different metaphysical views, properly scientific portions of theories can be also compatible with different conditions of diachronic composition of temporal parts into perdurant persons, and hence with different conditions of personal persistence. And if different conditions of personal persistence may be available within a certain scientific theory, it may follow that at the end of the day personal persistence is conventional even within a Quinean perdurantism, which would lose such an advantage discussed above. I shall argue, however, that even provided that there is a sort of under-determination of metaphysics (and hence of issues on diachronic composition of temporal parts) by scientific theories, still Quinean perdurantism is not committed to conventionalism. Accepting ontological relativity and then a form of internal realism, I guess that an advocate of Quinean perdurantism may bite the bullet on compositional facts over time being under-determined, but still reject that they are conventional. To achieve her aim, she can argue that the under-determination of diachronic composition by scientific theories shows nothing but the involvement of some metaphysical theory in the individuation of facts about diachronic composition. Still, this does not mean that personal persistence is conventional, but rather that is relative to a system of reference in which enter both scientific and metaphysical theories.

Finally, another problem for Quinean perdurantism may concern its commitment to a plurality of systems of reference, which entails a plurality of conditions for diachronic composition of temporal parts, and then a plurality of conditions of personal persistence. The result would be a plurality of perdurant persons which emerge from different theories somehow similarly to the way different images of the man in the world emerge

from different theories according to Sellars.⁶³ Facing such a plurality of perdurant persons, one may hence wonder which one we ought to privilege. One first answer may be that we should accept the conditions of personal persistence provided by physics, since as Quine argues, “theory in physics is an ultimate parameter. There is no legitimate first philosophy, higher or firmer than physics, to which to appeal over physicists’ heads” (Davidson and Hintikka 1969, 303). Another possible way out for Quinean perdurantism may be to accept a holistic perspective in which there is only one complex system of reference, in which the conditions of diachronic composition result in the intersection of all simpler systems constituting the complex one. The result would be a sort of “cluster view” of diachronic composition, which may even be framed in disjunctive terms. Take a toy model in which the holistic complex system S is composed by three simpler systems S^1 , S^2 , and S^3 ; and suppose that Φ^1 , Φ^2 , and Φ^3 are the conditions of diachronic composition respectively within each system. If diachronic composition can be framed in disjunctive terms in holistic complex systems, it follows that the condition of personal persistence within S will be the disjunction of the conditions of diachronic composition of the simple constitutive systems, namely ‘either Φ^1 , or Φ^2 , or Φ^3 ’. I am not sure whether this can work, however. If there is only one system of reference (the complex one), and it is defined by the union of simpler systems, are the latter parts of the complex system? If so, wouldn’t it be also necessary that the parts of the system are not incoherent (whereas in the pluralist version they can be)? And finally, if there is only one system, why should we call it a system of reference? I think this account requires a much more detailed analysis, that I shall leave for further work. Last chance for Quinean perdurantism is to bite the bullet on the plurality of perdurant persons given by the plurality of systems of reference. This is, by the way, the solution I shall be tempted to prefer in order to account for the commitment to a plurality of perdurant persons. The idea in this case would be that such plurality of perdurant persons only emerges if we assume a sort of “view from above” which transcend every systems of reference. But since this is in contrast with the fundamental idea of ontological relativity endorsed by Quinean perdurantism, such a plurality of perdurant persons reduces to a plurality which is nowhere, or better, which is only on the meta-level of comparison among different systems of references.

3.5. The moderate showdown

Having considered different kinds of moderate perdurantism, one question arises: which one should be preferred? What sort of moderate perdurantism should we choose to

⁶³ “There is man as he appears to the biochemist, to the physiologist, to the behaviourist, to the social scientist; and all of these images are to be contrasted with man as he appears to himself in sophisticated common sense, the manifest image which even today contains most of what he knows about himself at the properly human level.” (Sellars 1962, 37).

captain a revision of perdurantism under a new non-universalist light? To answer this question, I suggest comparing the moderate accounts above, focusing on the advantages they offer and the problems they have to deal with. To make things easier, I will consider the following aspects, formulated in a way in which a positive answer will correspond to an advantage (even in terms of absence of problem) for that theory:

- (1) *Does it solve the problem of the many?*
- (2) *Does it avoid the conventionality of personal persistence?*
- (3) *Does it avoid the argument from vagueness?*
- (4) *Does it provide an informative and non-mysterious account of personal persistence?*
- (5) *Is it consistent with our best scientific theories? Is it a scientific approach to personal persistence?*
- (6) *Does it meet our intuitions on personal persistence?*
- (7) *Does it provide us with a condition of persistence which works for all material entities (i.e. for both objects and persons)?*
- (8) *Does it solve the bridge problem of consciousness?*

The answers are included in the following table:

	1. Does it solve the problem of the many?	2. Does it avoid the conventionality of personal persistence?	3. Does it avoid the argument from vagueness?	4. Does it provide an informative/non-mysterious account of personal persistence?	5. Is it consistent with our best scientific theories?	6. Does it meet our intuitions on personal persistence?	7. Does it provide us with a condition of persistence which works for all material entities (i.e. both objects & persons)?	8. Does it solve the bridge problem of consciousness?
(Lewisian) Universalist Perdurantism	NO	NO	YES	YES (semantic)	-	NO	YES	YES
Brute Perdurantism	YES	YES	YES	NO	-	YES	YES	YES
Nomological Perdurantism	YES	YES	NO	YES	YES	YES	YES	YES
Reductionist Phenomenal Perdurantism	YES	YES	NO	YES	-	YES	NO	Yes, admitting capacities

For-me-ness Phenomenal Perdurantism	YES	YES	YES	YES (?)	-	YES	NO	YES
Quinean Perdurantism	YES	YES	NO	YES	YES	NO	- (It depends on the system of reference)	YES

Now, the approach to be preferred is likely to be the one with the majority of positive answers, provided that all issues and relative advantages/absence of problems have the same philosophical importance. But that does not seem to be true, since some advantage may be more or less significant than others, and some problem may be more or less substantial than others – at least, this is the case of the issues. Counting the “YES” is not enough; we should weight them, on the bases of our preferences and our scale of theoretical virtues.

Take brute perdurantism: it is a moderate position, and it is able to avoid both the problems of universalist perdurantism and the argument from vagueness. It has several advantages and only one clear flaw – on which however all advantages of the view seem to depend – namely the fact that it gives up informativity in favor of a sort of mysteriousness of diachronic composition and hence of personal persistence. Although just one, I find this flaw quite substantial, being a price I would like not to pay to defend this approach. Again, this is a matter of theoretical virtues necessary to evaluate different accounts, since the issue rests in the end on judgements about what aspects permit and what they prohibit. Thus, the consideration above might have no much force for those who find brutal composition perfectly reasonable. Similarly, a nomological perdurantism provide us with a great deal of advantages, but it lacks a solution to the argument of vagueness, which is crucial for any sort of moderate perdurantism - as I repeated several times from section 1.8.1. on. At the end of the day, I have to admit I am tempted to defend a phenomenal perdurantism which is committed to some form of irreducible self. This view shares all the advantages of brute perdurantism – avoiding the problem of the many, the conventionality of identity, and also the argument from vagueness – and what is more, it is not committed to a mysteriousness of personal persistence (which is in fact the critical flaw of brute perdurantism). As a matter of fact, as I argued above in section 3.3.3., a phenomenal perdurantism committed to something like a “for-me-ness” is able to answer the diachronic composition question of temporal parts into perdurant persons, providing an explanation of personal persistence, for it claims that temporal parts are unified into a single perdurant persons if and only if they are phenomenally continuous so that they instantiate a continuity of for-me-ness.

In conclusion, in this chapter I hope to have offered some new ways to understand perdurantism and in particular personal persistence within a perdurantist framework, which is not committed to unrestricted composition of temporal parts. At the same time, I think that advocates of a universalist perdurantism may regard this work as having a conclusion which is conditional in form: “if diachronic composition of temporal parts into persons is restricted, then the condition of personal persistence is such-and-such”. They may in fact be pleased with my conditional conclusion when they see its consequent, in terms of a restricted account of personal persistence. And maybe the whole debate about kinds of perdurantism may enjoy the attention of its orthodox advocates, as fathers paying attention to some critical son, whose distances hide a huge desire of building something new and still in connection with the past.

Concluding Remarks

Now it is the time to pay the bill, and explain the results of my research, their importance, and their contribution in the contemporary debate. The first and main contribution of my research is purely theoretical and concerns the analysis of a specific account of personal identity, namely the four-dimensionalist/perdurantist approach, which occupies a marginal position in the contemporary debate, despite the splendor given by people like Lewis, Heller, and then Sider. In particular, I aimed at defending some new ways for perdurantism, offering on one hand a defense of perdurantism against a nihilist drift (cf. chapter 2 and the proposal of a top-down perdurantism, in which perdurants are more fundamental than their temporal parts), and on the other hand an alternative to conventionalist accounts of personal persistence, based on the commitment to a principle of unrestricted diachronic composition (cf. chapter 3 and the investigation of moderate perdurantist accounts). I spent a lot of pages on these issues, and since I am not a huge fan of conclusions which repeat what has been said, I will avoid the reader such a repetition. Rather, I shall deal with a more difficult, but also more stimulating aspect, concerning the importance of my research on extra-theoretical levels. In a nutshell, I shall spend some words on considering the importance of this research besides the exoteric contribution within the metaphysical debate. And I do that because I do think that a metaphysical investigation of our persistence, and hence the introduction of some new account of the way we persist, can have important consequences on the moral and practical level. However, this is not uncontroversial: as the relation between personal identity and ethics is complex, some may actually deny such a role of metaphysics, arguing that metaphysical issues have no importance for our ordinary life and practices,¹ or even worse, that metaphysical issues are absolutely superficial and pointless, since they reduce to nothing but a matter of terminological incomprehension.² Since I am not entering in this debate, I will assume that the analysis of personal identity and persistence may have significant implications for our practices of moral responsibility. If not necessary and disputable, I guess this may be at least reasonable. And this is also what Parfit claimed,

¹ For an introduction on the relation between personal identity and ethics, see (Shoemaker 2016). Rejecting the priority of metaphysics over ethics, (Johnston 1987b, 1989, 1992b, 1997) defends a minimalist view according to which metaphysical facts of personal identity play no role in the justification of our practices and practical concerns [“in the particular case of personal identity, minimalism implies that any metaphysical view of persons which we might have is either epiphenomenal or a redundant basis for our practice of making judgements about personal identity and organizing our practical concerns around this relation” (Johnston 1997, 150)]. And see also (Rovane 1998, 5), according to which metaphysical theories of personal identity are built on top of the ethical concept of “personhood”.

² This is for instance what (Hirsch 2002, 2005, 2008a) argues. For a reply to Hirsch, as “the most developed and philosophically sensitive version of this approach”, see (Hawthorne 2009).

pointing out the consequences of his denial of a sort of enduring self: he said that his life “seemed like a glass tunnel, through which I was moving faster every year, and at the end of which there was darkness. When I changed my view, the walls of my glass tunnel disappeared. I now live in the open air” (Parfit 1984, 280). I do not know how much of transformative experience metaphysical investigations can have, but as far as personal identity is concerned, I do think that a deeper understanding on this issue may be of a great value for our lives. Having a clearer grasp of the conditions which make us the persons we are, and then of the moments in which we come into existence and then, sadly, we go out, may help us dealing with delicate cases which are far from exoteric, such as abortion, euthanasia, the morality of stem cell research, and then issues on advance directives.³ In what follows, I will show some ways in which a perdurantist approach to personal persistence defended above may provide us with new interesting understanding of practical and moral issues.

First of all, a perdurantist approach to personal persistence is able to account for the special concern we have for ourselves, which may appear in tension with an ontology of temporal parts at first sight: if we persist by having temporal parts, one may think, our concern for the future is the concern of some present time-slice for the well-being of some future different time-slice. But if this is the case, to be concerned for a future self would be something like being concerned for somebody which is very *similar to us*, like a twin, but that is not us strictly speaking. Although endurantists argued this as a problematic consequence for any positions accepting temporal parts of persons, and hence for perdurantism as well, I argue this rests upon a misleading interpretation of perdurantism as a kind of stage-theory (that, as I argued in chapter 2, we may overcome by giving up a bottom-up perdurantist approach in favor of a top-down perdurantist approach, according to which perdurant entities are more fundamental than their temporal parts). According to a perdurantist account of personal persistence, we are entities which are extended over time, and hence entities with a *global concern*: our concern is the concern towards a whole person whose temporal parts are *parts of the whole person*.⁴ As things stand, perdurantism can explain how the existence of temporal parts is compatible with the special concern for our future. Moreover, a perdurantist account of personal persistence may offer some interesting practical insights in cases like the advance directives⁵, in which puzzling scenarios as the following one may arise. Suppose that a woman is at the very first stages of Alzheimer’s disease and that she comes to know that there will be a moment in which she will be in a demented state and

³ Focusing on questions about abortion, fetuses and embryos, (Conee 1999) disagrees, arguing that metaphysical issues on personal identity are irrelevant for ethical issues.

⁴ I notice in passage that understood in this way, perdurantism can be also used to support some specific views on personal well-being, which defend the priority of life-time well-being on momentary well-being, by arguing that the well-being of the whole life of a person is more fundamental (or explanatory prior) than momentary well-being. The priority of life-time well-being has been recently defended by (Miyazono 2018). (Fletcher 2016) is a good introduction to the philosophy of well-being.

⁵ This case has been also discussed in (Shoemaker 2016, sec. 6.2.).

that she will be incompetent to make autonomous or informed decisions about her treatment. Suppose also that this woman values autonomy a lot, and that she would prefer to die than to be in such a demented condition. For this reason, she decides to sign an advance directive stipulating that no life-saving measures are to be used on her future demented self. But suppose that when the future demented self comes into existence, she does not want to give up: she wants to persist in her life. Now, one may wonder which is the right thing to do in a case like that. Are we justified to follow the advance directive of using no life-saving measures on the demented woman? But how can we do so if it is the same person who is denying the advance directive above? Setting aside a stage-theoretic view (according to which the woman in the demented status is not the same entity, but a different entity which is reasonably responsible for her own treatment, and should be respected in her decision to keep living), I think that even endurantism leads us to reject the value of advance directives: the woman in the demented status is the whole woman, with all the right of choosing for her future. And if this is in contrast with some past decisions, so much the worse for such past decisions, and then for “herself in the past”. But this is not a good conclusion, provided that we want to save the value of advance directives. I argue that if we accept a perdurantist approach (in particular in his top-down version, but not necessarily), advance directives may be justified by the fact that the wishes of the woman at the early stage of the disease (i.e. the wishes to live as far as her life will be such that will be worth living) may have control on the future as well. This is so because if persons are wholes extended over time (and provided that life should be paired by autonomy of decision to be worth living), it is reasonable to think that the life of the future demented self would render worse the life of the whole person. And if this is the case, it may be reasonable, or at least acceptable, the sacrifice of the demented self for the sake of the good of the whole. As one may take the difficult choice of amputate a part of her body for the well-being of the entire person, then one may decide to stop her life by amputating the (temporal) parts which may undermine the well-being of the entire perdurant person. One may object that cases of the first kind are cases in which the amputation of a part is tantamount with the preservation of the life of the whole (as in cases in which a leg becomes gangrenous for a disease), and hence are substantially different from cases in which one decides to stop with her life. But things are more complicated, and the world is full of cases in which sacrificing a part is not just a matter of survival: take a man donating a kidney to his old father, or even more curious cases in which a pilot may choose the amputation of a part of his own finger not to miss next motorcycle racing⁶. Still, I may agree that the comparison is a little bit risky, since in cases in which the removal of a part of our body is intended for some general well-being life is not supposed to be denied, whereas in the case of advance directives above, it is

⁶ Strange but true, this is what happened in 2007 to the Ducati Pilot Troy Bayliss, whose injuries as his little finger lead him to ask surgeons to amputate the mangled part so to accelerate his recovery and then allow him to get in the saddle for the upcoming competition.

properly the life of the temporal part which is in discussion. I am not going to take a stand on this issue here, which involve issues like the value of life and so on. What I want to point out is rather the consequence a perdurantist account may have on practical issues, and then the importance of an analysis of personal identity and persistence even in our ordinary life.

Let me now spend some words on another significant aspect of a perdurantist account of personal persistence, namely the way it can modify the relation we can have with our past. We usually think to our past and then to our past selves as something gone forever: all the experiences we had in the past do not exist anymore; they just passed, like youth and beauty when we'll be old. But if we are entities which are extended through time as perdurantism claims, then looking back to our past should not be like looking at something gone. Being wholes extended over time can help us avoiding mourning the loves which came to an end, or the pleasures we cannot enjoy anymore. Where endurantism leads to regret the absence of what we had, but we do not have anymore, perdurantism leads us to a different reaction, which rests upon the awareness that what we are now is nothing but a part of something bigger, something in which the meaning of our life obtains. And as entities extended over time, we can have different characters and experiences which are parts of the whole, but not parts to which the whole may be reduced. The person I am is not just the sum of features and experiences I'm having *now* (which is rather what endurantism and stage-theory seem to say), nor the person you are is reducible to the sum of features and experiences you are having now. In this way, perdurantism seems able to account for the contradictions that are parts of our life: we may be good in some occasions, but mean in others; we can make errors, but also do things we are proud of. All these features, experiences, and actions are parts of us, as features, experiences, and actions of our (temporal) parts. All the things we experienced or did in the past are not just substituted by the things we are experiencing or doing now; nor the things we are experiencing or doing now are going to be substituted by the experiences and actions to come. What we were is not cancelled, nor will be cancelled what we are; the broom of the universe does not wipe out our past, present, and future temporal parts, as they remain parts of ourselves as whole persons extended over time.

This also means that our nature, the nature of the persons we are, is a feature of the whole, and cannot emerge if we look just at the features of some temporal parts. Hegel said that "the truth is the whole", to account for the alleged contradictions in reality, which end being contradictions as soon as they enter into the big picture of the Absolute; with the same spirit, I would say that perdurantism may lead us to think to ourselves as wholes, in which "the true person is the whole person". Using a more prosaic example, as a football match is not reducible to its first five minutes, nor to its last five, persons are the result of the sum of all their temporal parts. This is I think the way we have to see at ourselves if perdurantism is true and this is the way we have to see at all other persons around us. I don't know whether reaching such a big pictures of ourselves is an easy matter, as restricted as we are into our present; we are not like the

Tralfamadorians in Vonnegut's *Slaughterhouse Five*, who "can look at the different moments just the way we can look at a stretch of the Rocky Mountains, for instance. They can see how permanent all the moments are, and they can look at any moment that interests them"⁷. But at least this is the direction a perdurantist account of personal identity points out in my opinion.

I imagine that some endurantists may argue that such a perdurantist conception of persons, and in particular the idea that the experiences and actions of past temporal parts exist as parts of the whole, has a significant disadvantage as soon as we consider painful experiences and mean actions. If it is true that perdurantism may help us overcoming the sadness for all good things which are gone, it also commits us to accept as parts of the whole all bad things happened in the past. If a temporal part suffering a terrible toothache, or worst the loss of a beloved person, does not disappear in virtue of its being part of a whole, then all past sufferance does not disappear either (even though we do not feel it now). But then, wouldn't be better to renounce all good things of our past if they bring out the existence all bad things as well?⁸ I don't think so. Recognizing the existence of pain, in terms of painful parts constituting the whole person extended over time, can help us to accept reality, to recognize that everything, from joy to suffering, remains into the world even when we are not close enough to perceive them as parts of us. This might also have some good effect on our practices, for instance leading us to reduce our and others suffering, if suffering does not just disappear with time, but is what the whole experiences through some of its temporal parts. As things stand, defending a perdurantist account of persons as entities extended over time does not mean embracing an apathetic view of the world, a naïve stoicism in which we just accept our past, present, and future. Rather, it leads us to look at the experiences of our past and future temporal parts not in terms of scars we bring today on our bodies, but in terms of legitimate parts of ourselves, that we should respect and take care of. Thus, a perdurantist account of personal persistence may help us releasing emotions like the grief over the past and the anxiety for future death – that according to Parfit are based on the existence of an alleged enduring self and are the roots of human suffering; cf. (Parfit 1971a, 27, 1984, 280) – without renouncing to conceive our persistence as a matter of identity over time.⁹ Going

⁷ See Kurt Vonnegut, Jr., *Slaughterhouse Five; Or the Children's Crusade*, New York: Dell Publishing, 1969, p. 20. This passage has been also quoted by (Velleman 2006, 17).

⁸ A similar argument has been presented by Francesco Orilia as a "moral argument against eternalism" during a talk held at the University of Milan within *the CPT – Colloquia 2017*. Although Orilia referred very briefly to this argument as a further argument in defense of presentism, setting aside any further detail, it was the spark driving my attention to this issue.

⁹ On this issue, see also (Velleman 2006), who offers an amendment of the Buddhist claim that the existence of an enduring self is the root of human suffering, by saying that the root of suffering is actually the idea of the passage of time (which is based indeed on the idea of an enduring self). As things stand, the liberation from suffering would pass through the liberation from the passage of time. Although I have not discussed passage of time or eternalism, focusing more on perdurantism and the nature of perdurants as extended over time, I suspect my view is similar to the one he defends.

back again to Vonnegut's imaginary Tralfamadoreans, who facing a corpse just think that "the dead person is in bad condition in that particular moment, but that the same person is just fine in plenty of other moments" (p. 23), perdurantism may lead us to have a similar reaction with respect to our present, past, and future temporal parts, which are parts of a whole perdurant. While I am aware that crucial work on the practical consequences of embracing perdurantism yet lies ahead, the hope is that I have shown some possible consequences in our lives of taking a perdurantist account of personal persistence, and hence some way my contribution on the metaphysics of personal persistence may be of interest to everyone.

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