Persistence reconsidered: Beyond the endurance / perdurance distinction

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Abstract

In this paper, I will argue that we need to consider the 'change-makers' if we want to provide a comprehensive theory of persistence. The classical theories of persistence, endurantism and perdurantism in all their flavours, are content with avoiding the looming contradiction in the context of Leibniz's Law. They do not account for *how* change is brought about. I argue that this is not sufficient to constitute a theory of persistence and I will introduce produrantism as a new access towards a comprehensive approach.

Keywords: Persistence, Produrantism, Endurantism, Perdurantism, Dispositions, Change

1 Introduction

The problem of persistence is one of the oldest problems in philosophy. It stems from a very common fact, namely that material objects change. This is so common place that it is hard to find something which is not

an example of change.[2] The *problem* with this is that, although changing, the objects stay the same. In a first approximation the problem of persistence, thus, is the attempted reconciliation of identity and difference, or to be more precise the reconciliation of numerical identity with qualitative difference.

It is not so much a question about the specific persistence conditions of specific things or kinds of things, but rather a question about the conditions of persistence *per se*. It may be that living beings, for example, need to exchange matter (metabolism) to persist. If so, this then constitutes a special challenge for theories of persistence of living beings and some even argue that living beings form a distinct ontological kind, because of their persistence conditions [28]. But this is not the general problem of persistence, which asks 'How is change *simpliciter* possible?'.

Now, of course, change and persistence are not the same thing, but they are closely related. Not only because some kinds of things need to change in order to persist, as just was mentioned, but rather because virtually everything changes during its lifetime. Persistence just is existence through time, but *de facto* this calls for a theory of change, as the persisting thing will most likely change during its existence. Hence, I take this to be the common ground from which every explication of persistence starts: material objects persist through time, although they change. We need a theory of persistence which is compatible with change. Or better yet: one which mirrors the close conceptual connection between change and persistence.

The paper proceeds as follows. In section 2, I will explicate the concept of change. Building on this, I will review the contemporary accounts of persistence in section 3. These fall broadly into two camps – endurantistic and perdurantistic theories – which can be spelled out in a quite diverse fashion. Nevertheless, in section 4, I claim that all theses accounts have one thing in common. They focus solely on not being contradictory. None of them actually provides a theory of how change is brought about. I will sketch produrantism as an alternative conception, which takes the 'change-makers' into account to arrive at a comprehensive approach to persistence. Finally, section 5 concludes.

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[2]War may be an exception to this claim. According to [15] war never changes.

2 The concept of change re-evaluated

A theory of persistence needs to be change-friendly, and thus I will take a closer look at the concept of change in this section. According to the classical account, '[c]hange needs identity as well as difference' [25, p. 89]. It is initially plausible that both criteria are necessary for change and that they are jointly sufficient. Change needs to be differentiated from exchange, and identity is supposed to be the differentiating criterion. It is ontologically a rather different matter, whether my girlfriend dyes her hair red, or whether I kiss her ginger twin sister.

Also, the role that difference plays for the concept of change seems to be rather straightforward. It seems that something needs to *change*, in order for there to be a phenomenon of change in the first place. If a ball stays blue, there is no change, and so change needs to be differentiated from stability. Here a first caveat is in order: the properties involved in the change need to be incompatible.[3]

To sum up the pre-theoretical intuitions: in a case of change one and the same object exemplifies incompatible properties (in the same way) at different times.[4] However, this straightforward characterisation of change is in tension with a plausible principle, called[5] Leibniz's Law: $\forall x \forall y \forall P \forall Q(x = y \rightarrow (P(x) \leftrightarrow Q(x)))$. Leibniz's Law claims that if two objects are identical, then they share all their properties. Now, in the case of change, we have an identical object and two incompatible properties, which leads to a contradiction.

In the next section, I will review the most common attempts in the contemporary debate about persistence, to avoid contradictions in the context of Leibniz's Law. Note, however, that I take the problem of persistence **not** to be the problem of change. I hold change to be a sub-species of persistence, because stability is equally explanation-worthy as change even if it may not lead to a contradiction. My diagnosis for the focus on change is that the contemporary debate about persistence

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[3]There are different ways of spelling this out. Aristotle claims in the Categories [2] that predicates have a genus, and anything can only fall under one predicate of a specific genus (at a time and regarding the same aspect). W. E. Johnson [17] speaks of determinables and determinates to capture the same core idea. A technically more refined variant of this can be found in Arthur Prior's works [27].

[4]The specification 'in the same way' is important since, it is not a change if someone 'is crooked according to the Times' and 'honest according to the News' [21, p. 204].

[5]I do not claim that Leibniz has actually held the principle in this way. The literature nevertheless refers to it as 'Leibniz's Law', and I stick to this convention.

accepts that the avoidance of the contradiction is sufficient for a theory of persistence. As will be become clear in section 4, I do not share this commitment.

3 Contemporary theories of persistence

In this section, I will discuss the most prominent contemporary theories of persistence.[6] These fall into two camps: perdurantistic and endurantistic theories. Roughly, perdurantists believe that objects are four-dimensional wholes, whose temporal parts exemplify the ordinary properties. Contrary to this endurantists stick to the common belief that objects are three-dimensional. Thus, enduring objects are multi-located in space-time, being wholly present [8] at each of their locations.

The debate about persistence is nowadays standardly held assuming eternalism.[7] Eternalism is only sometimes explicitly assumed (see e.g. [1, p. 11])) but virtually all positions which are discussed later implicitly presuppose eternalism. An indicator of this is that the very notion of 'mulit-location' is only sensible given eternalism. Although personally I believe that the opposing view, presentism, not only provides a viable account of the nature of time but also a solution to the problem of temporary intrinsics, I will follow the contemporary debate in presupposing eternalism for the sake of this paper. Note, however, that produrantism might constitute a way of transcending the eternalist limitation.

As for the remainder of this section, in subsection 3, I will present theories from the perdurantistic camp, and in subsection 3, I will turn to alleged solutions to the problem of persistence from the endurantistic camp. Then, in subsection 3, I will take a step back and consider the general set up of the theories. It turns out, that they all have something in common, namely they all are concerned with sidestepping the looming contradiction in the context of Leibniz's Law. The question of *how* change is brought about is not covered at all. In the next section, section 4, I will then sketch an alternative account of persistence which includes

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[6]For an overview of the debate about persistence and its location within the philosophy of time see [11].

[7]Eternalism and presentism are accounts of the nature of time. Presentists think that only the present moment exists or is real, whereas eternalists believe that all of (space-)time exists on a par.

the change-makers, i. e. the entities which bring about the changes in the world.

PERDURANTISTIC ACCOUNTS

Perdurantists take it that at each moment there exists but a temporal part of a larger four-dimensional object. This object has different temporal parts at different times, and these temporal parts in turn can have different properties. Take someone who stands up and thus changes her shape from bent to straight. It is a different temporal part which has the intrinsic property of being bent than the temporal part which is straight, following the perdurantist. It is unproblematic for different objects to have incompatible properties. By taking temporal parts to be the primary property bearers, perdurantism avoids the looming contradiction in the context of Leibniz's Law. The temporal part which is bent just is not identical to the temporal part which is straight. Hence, the perdurantist solves the problem of persistence by distinguishing the primary property bearers (the three-dimensional temporal parts) from the persisting object (the four-dimensional whole).

There is a version of perdurantism, called **exdurantism** [30, p. 84], which takes the three-dimensional bearers of ordinary properties to be temporal stages rather then temporal parts [3, p. 91]. In our example, one of the temporal stages is bent and another one is straight. The two stages involved are not parts of a persisting four-dimensional whole, following the exdurantist, but are related by the counterpart relation.[8]

ENDURANTISTIC ACCOUNTS

Endurantism holds on to the everyday intuition that objects are three-dimensional. Endurantistic objects persist by being multi-located in space time [23, p. 2]. There are several ways an endurantist could try to avoid the contradiction in the context of Leibniz's Law. The first way would be to put a time-index onto the properties. This view is often called **indexicalism** [32]. The persisting object, o, is bent$_{t1}$ and straight$_{t2}$. As it is neither bent simpliciter nor straight simpliciter, no

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[8]Exdurantism, hence, adopts the this-worldly analog of Lewis's account of modality. According to Lewis, there is no trans-world identity, as Kripke [19, p. 45] would have it, but rather there are modal counterparts in other worlds.

contradiction arises. Being bent$_{t1}$ would only be incompatible with being straight$_{t1}$.

The problem with indexicalism becomes evident when one considers a case of stability. Take a red ball which stays red. According to the indexicalist this ball always exemplifies a different property: red$_{t1}$, red$_{t2}$, red$_{t3}$ and so on [13, p. 130]. So, although indexicalism avoids the contradiction in the context of Leibniz's Law and can distinguish between change and exchange, it is often discarded.

Another possibility for the endurantist is to time-index the copula [18, p. 129], call this **copularism**, or add an temporal adverb [14], call this **adverbialism**. Often the term adverbialism is used as an umbrella term for both versions, but I prefer to have the conceptual resources to distinguish between them. Adverbialism and copularism are considered the strongest variants of endurantism. The copularistic solution can be depicted as: o is$_{t1}$ B and o is$_{t2}$ S; and adverbialism as: o is t1-ly B and o is t2-ly S.

David Lewis provides yet another version of endurantism. Call this alleged solution to the problem of persistence **relationalism** [1, p. 19]. According to the relationalist, bent and straight are disguised relations [21, p. 204]. o stands in the relation of straightness to one space-time-point and in the relation of bentness to another space-time-point.[9]

There are two endurantistic accounts in the vicinity of relationalism which respect the intuition that ordinary properties are not relations. One way would be to time-index the relation of property-exemplification; the other way would be to take a three-place relation of property-exemplification. Let us call these views in turn **exemplificationism**$_{tn}$ and **exemplificationism**^{3}.[10] According to exemplificationism$_{tn}$ o stands in one relation of property-exemplification to the property bent and in another to the property straight. But exemplificationism$_{tn}$ can be attacked on a similar ground as indexicalism. An object which stays red would always stand in a different relation to the property red.

However, exemplificationism^3 does not fall prey to this objection. In our example, o stands in the relation E^3 to bent and t1: $E^3(o, b, t1)$; and also to straight and t2: $E^3(o, s, t2)$. It is the same relation which re-

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[9]Note that although Lewis presents this version of endurantism, he himself rejects relationalism, because for him it is evident that ordinary properties are not relations.

[10]One could formulate both versions in second order logic as one of the relata is a property, here B and S, or one could use a singular term denoting a universal, here b and s. I follow Uwe Meixner [24, p. 95], who prefers the second variant.

lates objects, properties and times. On top of that, this view accepts that properties are not relations, as Lewis would like to have it, and in the case of change it is numerically the same object in both relations. Thus, exemplificationism[3] can account for continuity and can differentiate between change and exchange. Exemplificationism[3] constitutes a strong variant of endurantism, yet it is often overlooked in the debate.

TAKING STOCK

Let us now consider these theories of persistence *en pack*. Remember that Leibniz's Law poses a threat to accounts of persistence. Apparently, an object that persists and changes exemplifies incompatible properties. So, if the same object has incompatible properties in the same way this, together with Leibniz's Law, leads to a contradiction. The different accounts of persistence present different ways of avoiding this contradiction. They all deny that it is the same object which has the incompatible properties in the same way. They disagree on how to disagree with this statement. Classical perdurantists and exdurantists hold that it is not the same object; indexicalists think the properties are not incompatible; according to relationalism there are not even (one-place) properties involved; while copularism, adverbialism, exemplificationism$_{tn}$ and exemplificationism[3] all temper with the ways the properties are had.

I will call the set of classical perdurantism, exdurantism, indexicalism, relationalism, copularism, adverbialism, exemplificationism$_{tn}$ and exemplificationism[3] the 'standard theories of persistence'. All of these strategies are sufficient to avoid the contradiction, so much is true, but this is not enough to capture change. As we have seen, change consists of identity and difference. I prefer to speak of continuity rather than identity.[11] The standard theories constitute ways of supplying difference without contradiction, but also an account of continuity is needed.

Classical perdurantism ensures continuity via the parthood relation. If two temporal parts are parts of the same four-dimensional object, a persistence phenomenon is occurring. According to Ted Sider, perdurantistic persistence is a case of strict identity [30, p. 54]. Understood

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[11]The term 'continuity' is more neutral than 'identity'. There are theories of persistence that deny cross-temporal identity. Exdurantism, for example, does so explicitly. It would be unfair to exclude exdurantism *per definitionem*, so I avoid to demand 'identity' for change.

like this, multi-location is not a difference-maker between endurantistic and perdurantistic accounts of persistence. Both claim that persisting objects exist at every moment of their history and thus are multi-located. Temporal mereology, via the parthood relation, tells us which temporal parts form a four-dimensional whole, which itself persists through time by multi-location. The other variant of perdurantism, exdurantism, connects the different temporal stages of one persistence phenomenon via the counterpart relation. Exdurantists deny trans-temporal identity, and hence strict identity over time cannot be the continuation-maker for them. It is *prima facie* the counterpart-relation that differentiates change from exchange for the exdurantist and it is only this.

All endurantistic accounts of persistence do not fiddle with the notion of objects. For all of these accounts, objects are three-dimensional and thus persisting objects are multi-located in space-time. Just as our everyday intuition tells us. According to all variants of endurantism, strict identity is the continuity-maker.

There is, thus, a way to account for continuity for all the standard theories of persistence. But this is virtually never mentioned. The different standard theories are only presented as to how they avoid the looming contradiction in the context of Leibniz's Law. It is then not bothered to spell out the full account of change. My diagnosis for this is that it is considered common ground in the debate about persistence that only the requirement 'difference' is problematic, because only it may lead to a contradiction. An indicator for this is that the debate focuses solely on avoiding the contradiction. Another indicator for this is that there are no hybrid theories. It is ontologically possible that, say, properties are relations and objects have temporal parts. This relationalism-perdurantism hybrid account avoids the contradiction for sure. It only seems superfluous if avoiding the contradiction is the sole task of an account of persistence. This can be had 'cheaper', i. e. by adopting either only relationalism or only perdurantism. Hence the contemporary debate about persistence focuses solely on spelling out difference without succumbing to Leibniz's Law.

This claim is backed up by another alleged solution, which we have not covered so far. One could argue that Leibniz's Law is only concerned with synchronic identity and, as it was never intended to capture diachronic identity, cannot be applied to persistence phenomena. Now, although dropping Leibniz's Law avoids the contradiction, this

solution is not satisfactory. Persistence is still mysterious. It is hard to conceptualize identity and difference together and the contradiction in the context of Leibniz's Law is but a symptom of this underlying conceptual challenge. And this is why just avoiding the contradiction is not sufficient to give an account of change and persistence.

So, I claim that there is more to change than contradiction-freeness. But I also hold that there is more to persistence than change, as stability is as much explanation-worthy as change. If I am right with this assessment, then the problem of temporary intrinsics is a sub-problem of the problem of change which itself is a sub-problem of the problem of persistence.

On top of that changes do not just occur. Personally, I believe that changes are *brought about*, and I will have more to say about this in the next section. But no matter your conviction, changes have to be accounted for in some way or other. The contemporary debate about persistence takes it for granted that there are changes in the world and, of course, I do not argue with this claim; I merely ask how: How do these changes come about? I just cannot see how one can ignore this question when trying to give a comprehensive account or persistence. In the next section, I will present one specific way answering this question and sketch a corresponding account of persistence.

4   Beyond the endurance / perdurance distinction

In this section, I will introduce *produrantism*, my favourite account of persistence. 'Produrantism' is a term of art that I have invented. It is inspired by the terms 'endurantism' and 'perdurantism', whereat the 'pro' stands for 'process'. I do not claim that produrantism is the only or best way to account for persistence; but it is a more comprehensive account of persistence than the standard theories. I believe that dispositions existenitally bring about the changes in the world. So, subsection 4 is concerned with introducing dispositions. I take the manifestations of dispositions to be processes.[12] Processes are time-extended entities and thus provide the link between dispositions and persistence. I call the resulting account of persistence produrantism. Subsection 4, then

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[12]I have argued for my favourite account of dispositions at length. The interested reader is referred to [12]. In chapter 4, I argue *in extenso* why we need to understand the manifestations of dispositions as processes.

sketches how produrantism solves the problem of persistence.

CHANGE-MAKERS

Standardly, dispositions are understood as properties that need not be manifest [7]. Take the well known example of fragility. A glass cup is fragile. If it is struck with a hammer, it will break. Before the strike it is not broken, i.e. the fragility is not manifest. There are several stimulus conditions – striking it with an hammer, throwing it to the ground and so on – which may all lead to its breaking.

The current debate about dispositions revolves around so-called masking cases (Cross 2012 [9, p. 116]). The hardest masking cases are those where there is time gap δt between the occurrence of the stimulus and the manifestation (Schrenk 2010 [29, p. 729]). Take, for example, the ingestion of a deadly poison at time t_1, followed by the administering of the corresponding antidote at t_2 (Bird 1998 [5, p. 228]).

There seems to be a structural reason why these kinds of masking cases are so notorious.[13] Virtually everybody in the debate about dispositions thinks about stimulus and manifestation as events, be that implicitly or explicitly, and following Hume, 'all events seem entirely loose and separate.' (Hume 1748 [16, p. 111]). Now, if the stimulus and the manifestation are separate events, there is, in principle, a possibility of interference. And as something can come in between the stimulus and the manifestation, the manifestation can be prevented.

In linguistics, this phenomenon is well discussed in the context of the so-called imperfective paradox (Dowty 1977 [10]). From 's was walking' we can conclude that 's has walked', but in contrast, from 's was walking to the university' we cannot conclude that 's has walked to the university'. No matter how short the time that s was actually walking, this is enough to make it true that s has walked, whereas no matter how far s already came, as long as she has not reached her destination, there is in principle the possibility of interference (Thompson 2008 [31, p. 126]). We can never conclude that s has actually walked to the university while her action is still ongoing (the imperfective 'is walking'); we could conclude that only if she already reached the university, but then she is not walking any more.[14]

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[13]I have argued elsewhere in much greater detail for this claim. See (Fischer 2017 [12, Ch. 4]).

[14]This observations go back to joint work with Niels van Miltenburg (2015 [26, ch. 6]).

I think that we can handle the masking cases if we consider the manifestations of dispositions as processes. This strategy attacks the 'loose' part and not the 'separate' part of Hume's dictum. 'Loose' and 'separate' are two different properties of events, and thus there are basically two strategies for building an ontology which exceeds the humean toolbox.[15] I propose that the manifestation of a disposition is an ongoing process, which starts with the stimulus, rather than stimulus and manifestation being two separate events.

The process-understanding of manifestations solves the addressed masking problem. With the ingestion of the poison, a poisoning process starts. This can lead to death or it can be stopped by administering the corresponding antidote. Even if the antidote is administered very early, there was poisoning going on. So, in a nutshell, process ontology dissolves the masking problem by differentiating between a manifestation process and its end result. While the end result (death in our example) can be prevented, it cannot be prevented that the process (poisoning) occurs if the right trigger occurs.[16]

This short overview already reveals that temporal aspects play a crucial role for understanding dispositions. Processes are essentially persisting entities, and this indicates that also from the viewpoint of the debate about dispositions a comprehensive account, including persistence, makes sense, if not is required. Thus, in the next section, I will sketch how an account of persistence including processes could look like.

PRODURANTISM

In this section, finally, produrantism will be introduced. I will also describe how the produrantistic account avoids the contradiction in the context of Leibniz's Law. But contradiction-freeness comes out as a corollary for produrantism, it is not its *raison d'etre*. However, a full account of produrance is beyond the scope of this paper. Rather, I want to show that it is possible to include change-makers into the account of persistence.

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[15]I do not claim that Hume himself has a restricted ontology, excluding all entities which are not loose and separate. The neo-humean philosophers, championed by David Lewis, however have explicitly done so [22, p. ix].

[16]Of course also a lot can be said about what the right trigger is. Here is not the place for this, however. I can, once again, only refer to [12], where this is covered in length.

The produrantistic account consists of three 'levels'. First, there are the dispositions whose manifestations are the processes on the second level. Finally there are the ordinary objects which are the primary property bearers. Thus, produrantism avoids the looming contradiction by distinguishing between the persisting entity and the primary property bearers. In figure 1, a change from red to blue is depicted. The property bearer of the redness, a_1, is not identical to the blue entity, a_2.

Jeffery Brower [6] has revealed that perdurantism belongs to a group of structurally identical solutions.[17] Structurally it is enough to avoid the contradiction if the persisting entity and primary property bearers are not identical. To arrive at a theory of persistence, this structure needs to be complemented with an account of the nature of the entities involved and the relation between them. For classical perdurantism, the primary property bearers are temporal parts while the persisting entity is the four-dimensional whole. Obviously, the relation between them is the parthood relation.
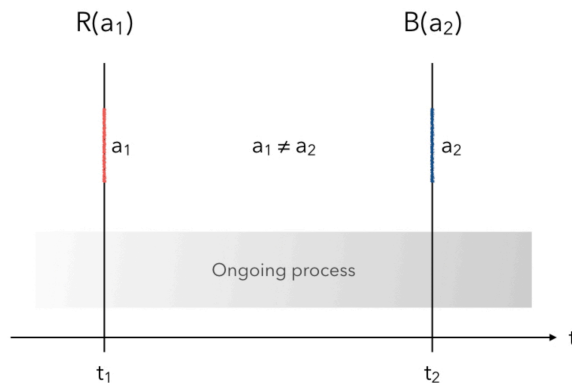

Figure 1: *Produrance*

In the case of produrantism, processes are the persisting entities, while abstractions are the primary property bearers. This goes back to an idea of Henri Bergson [4]. Bergson has worked extensively on

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[17]Brower's own account, 'Aristotelian Endurantism' as he calls it, also belongs to this group. We do not have the space to go into his account here, but the name already gives it away that it belongs to the endurantistic camp.

the relation between the underlying process and the objects we ascribe properties to. 'For Bergson, there is always a priority of movement over the things that move; the thing that moves is an abstraction from the movement.' [20, sec. 2]. We cannot go into this here and so this short sketch of produrantism will have to do. Although sketchy, it is sufficient to see that produrance, is able to *account* for stability phenomena in the same way as it accounts for change phenomena. The abstractions, a_1 and a_2, ontologically depend on the underlying process, no matter whether they exemplify incompatible (change) or the same (stability) properties.

5 Conclusion

In this paper, I have argued that the contemporary debate about persistence focuses solely on avoiding the looming contradiction in the context of Leibniz's Law. This one-sided approach is the reason why the debate got stuck, I believe. An account of change needs to include continuity as well as difference, and an account of persistence needs to cover stability as well as change. All the standard theories of persistence – classical perdurantism, exdurantists, indexicalism, relationalism, copularism, adverbialism, exemplificationism$_{tn}$ and exemplificationism[3] – are content with spelling out difference in a contradiction-free manner. They can be amended to include continuity, but none of them accounts for how change is brought about or how things persist through time. I have introduced produrantism as a counter-project. Produrantism includes dispositions as the change-makers into the picture. Their manifestations are processes, which themselves are the basis for persistence. Produrantism avoids the contradiction by differentiating between the primary property bearers and the persisting entities, but is not reducible to this job.

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