ORIGINAL RESEARCH

Check for updates

By(e) enduring? An answer to Wasserman

Maria Scarpati[1,2] · **Claudio Calosi**[3] ●

Abstract
According to a recent argument due to Wasserman, endurantism does not qualify as an explanatory theory of persistence inasmuch as it either provides a circular account of persistence facts or merely rejects the perdurantist's explanation of such facts. This paper challenges Wasserman's conclusions by pointing out that an endurantist answer to his complaint is available thanks to the locational notions of persistence provided in the work of Gilmore, Parsons, Balashov among others. It then gives details as to how such notions can be used to answer Wasserman's specific argument for the idea that endurantism is either unexplanatory or circular. After a brief introduction (Sect. 1) we provide the technical notions that we need to answer Wasserman's complaint (Sect. 2) and offer a phrasing of endurantism which is immune to that complaint in terms of locative notions (Sect. 3). We then prove that two further conceptions of endurantism are entailed by that phrasing. Crucially, such conceptions are phrased in terms that Wasserman himself cannot, on pain of inconsistency, dismiss, as those are the very terms in which he conceives of endurantism in the first place—that is, whole presence and the rejection of temporal parts (Sect. 4).

Keywords Persistence · Endurantism · Explanation · Being wholly present · Temporal parts · Location

✉ Maria Scarpati
maria.scarpati9@gmail.com

Claudio Calosi
claudio.calosi@unige.ch
https://claudiocalosi.xyz/

1   University of Neuchâtel, Neuchâtel, Switzerland

2   University of Oxford, Oxford, UK

3   Department of Philosophy, University of Geneva, Geneva, Switzerland

⚛ Springer

1 Introduction

In a recent paper[1] Wasserman argues for two claims, which we label EXPLANATORY PERSISTENCE and ENDURANTISM IS NOT EXPLANATORY:

> EXPLANATORY PERSISTENCE: Theories of persistence are to be phrased in explanatory terms: they are to provide (metaphysical) explanations by e.g., specifying those facts persistence facts obtain in virtue of—see Wasserman (2016, p. 245).

> ENDURANTISM IS NOT EXPLANATORY: Endurantism is not a philosophical theory of persistence inasmuch as it does not provide a satisfactory explanation of persistence facts. It either (i) provides a circular explanation, or (ii) merely rejects the perdurantist's explanation.

While we are sceptical about both claims, for the sake of argument we will concede EXPLANATORY PERSISTENCE here. We will also follow Wasserman in taking locutions such as "x φ-s *by* ψ-ing" to express explanatory claims—despite being agnostic about the matter ourselves.[2] We will, by contrast, target ENDURANTISM IS NOT EXPLANATORY, which we regard as mistaken. Wasserman takes endurantism to be effectively captured by the following:

> ENDURANTISM: Objects persist by being wholly present at each time of their existence, where

> WHOLLY PRESENT (WP): x is wholly present at $t =_{df} x$ exists at t, but not by having a proper temporal part at t.

The argument in favor of ENDURANTISM IS NOT EXPLANATORY goes roughly as follows. Given ENDURANTISM and WHOLLY PRESENT enduring objects persist by either (i) existing at different times, or (ii) failing to divide into temporal parts. But (i) amounts to the claim that enduring objects persist by persisting. This is clearly circular and thus provides no explanation. Claim (ii) does not provide any explanation either. It just refuses the perdurantist explanation—see Wasserman (2016, pp. 247–248). It should be noted that this argument crucially depends on WP.

Indeed, says Wasserman, "[m]any people take (WP) to be the most promising definition of 'wholly present'. I concur" (Wasserman, 2016, p. 247). We do *not* concur. There are many ways, more promising ways to articulate both endurantism and whole presence. These more promising ways, it turns out, do not fall prey to Wasserman's complaints.

2 Setting the stage

Recent contributions on persistence—Gilmore (2006), Gibson and Pooley (2006), Parsons (2007), Balashov (2010), Gilmore (2018), Costa (2020a), Correia (2022)

---

[1] Wasserman (2016).

[2] Wasserman takes Lewis's use of the locution "x φ-s *by* ψ-ing" as a sign that he has an explanatory claim in mind. See Lewis (1986, p. 202).

to mention but a few examples—distinguish between *locational* and *mereological* phrasings of the endurance/perdurance distinction.[3] In fact, this has become such standard practice as to be labeled, by Costa (2017, p. 57), the *locational turn*. Roughly, in the former case, conditions for persistence are given in terms of the locations of material objects—in a technical sense to be duly characterized below. In the latter, they are given in terms of their mereological structure instead.

Wasserman (2016) can be read as an invitation to take yet another turn, the *explanatory turn*. Our claim is that the locational turn helps one embrace the explanatory turn, in that once endurantism and perdurantism are phrased in locational terms they can both plausibly be taken as explanatory claims. In particular, endurantism, phrased in locational terms, can answer the ENDURANTISM IS NOT EXPLANATORY ARGUMENT. Whether it provides a completely satisfactory explanation of persistence facts remains to be seen.[4]

To provide a rigorous formulation of different metaphysics of persistence we only need two primitive notions:

(i) *improper parthood*—which holds either between material objects or between spacetime regions;

(ii) *exact location* (@)—which holds between material objects and spacetime regions.

As for (i), we only assume that improper parthood is a partial order. Finally, we understand (ii) in the present context along the following lines, from Parsons (2007) and Gilmore (2018) respectively:

My exact location is like my shadow in substantival space (Parsons, 2007, p. 203).

[A]n entity *x* is exactly located at a region *y* if and only if *x* has (or has-at-*y*) exactly the same shape and size as *y* and stands (or stands-at-*y*) in all the same spatial or spatiotemporal relations to other entities as does *y* (Gilmore, 2018, Sect. 2.1).

We should be clear that Gilmore's gloss above does not provide a *definition* of exact location—even if phrased in terms of a biconditional.[5] Such an informal gloss is usually employed in order to provide an intuitive grasp of the relevant target notion. As with any undefined, primitive notion, we regiment its "behavior" by requiring that it obeys certain principles. In the present context, in particular, we take exact

---

[3] See Gilmore (2018) and Costa (2020a) for an introduction.

[4] Thanks to an anonymous referee here.

[5] Gilmore's informal gloss mentions "objects having properties at regions". Indeed, it is well known that the standard endurantist solution to the puzzle of change has it that enduring objects instantiate properties only at regions. Which regions? There are two serious candidates in the present context: the first one is the exact location of an object, the second is the instant *t* the relevant exact location is part of. The first is adopted in, e.g., Gibson and Pooley (2006). The second is adopted in classics such as, e.g., Mellor (1980). There are indeed different ways to understand such relativization. On the one hand, one can think that a seemingly monadic property is really a relation to a region—see e.g., Mellor (1980). On the other, one can think that the region acts as an adverbial modifier on the instantiation of a truly monadic property—see e.g., Johnston (1987) and Haslanger (1989).

location to obey the following principle, to the point that proper parts—as defined in (2) below—and wholes cannot be colocated:

1. NO PART- WHOLE COLOCATION: If x is a proper part of y, then x and y have distinct exact locations.

We will discuss (1) in Sect. 4.[6] For now, we shall just mention that—mostly for the sake of convenience—we make some further assumptions which are commonplace in the literature. We assume, in particular, that there is one fundamental spatiotemporal arena, spacetime, and temporal and spatial regions are spacetime regions of different sorts. We take it that there is no deep metaphysical distinction between the tenses. For an explicit formulation of all these assumptions see, e.g., Gilmore (2018).[7] As Gilmore himself points out, relatively little depends on these assumptions, and the whole picture could be reformulated in terms of spatial regions at different times instead.

The reason why the two notions above will suffice for us is that we confine ourselves to a classical setting. In such a setting, the entire spacetime can be foliated by *instants* that are *temporally unextended* and such that they are not proper parts of any other temporally unextended region.[8] This is just for the sake of simplicity—for a relativistic extension see, e.g., Balashov (2010). As Wasserman's discussion itself is set in a classical framework, this is unproblematic for our present aims.

Given such assumptions and primitives, we define the following notions—using first order plural logic with identity, double signs standing for plural variables:

2. PROPER PART: x is a *proper part* of $y =_{df} x$ is part of y and x is distinct from y.
3. OVERLAP: x and y *overlap* $=_{df}$ There is a z that is part of both x and y.

---

[6] As a matter of fact, more principles are usually imposed on the behaviour of exact location. The point is best appreciated by considering how the following locational notions can be defined in terms of exact location first. WEAK LOCATION: x is weakly located at $r =_{df} x$ is exactly located at a region that overlaps r. ENTIRE LOCATION: x is entirely located at $r =_{df} x$ is exactly located at a region that has r as a part. Given these definitions, we require Exact Location to obey the following principles. EXACTNESS: If x has a weak location, then x has an exact location. CONVERSE EXACTNESS: If x has an exact location, then x has a weak location. We require, further, that WEAK LOCATION be the weakest locative notion. This is done by endorsing the following principle: if x bears any locative relation to r, then x is weakly located at r.

[7] In effect, if one thinks that location is "existence entailing'—roughly, that if x is located at r, then r exists—it seems that the locational notion we rely on entails the existence of spacetime regions—something that, e.g., *spacetime substantivalism* guarantees. Albeit widely endorsed, spacetime substantivalism is by no means an uncontroversial view. As is well known, the main alternative to substantivalism is *relationalism*. Two things should be noted however. First, the notions we employ are not incompatible with relationalism about spacetime *per se*: they are only incompatible with an eliminativist version of it—one which has it that spacetime regions do not exist at all. There are, however, several non-eliminativist forms of relationalism as well. For instance, according to an increasingly popular version of the view, there are spacetime regions but they are simply derivative on, or grounded in, spatiotemporal relations between material bodies. The notions we employ in the present paper are compatible with such a form of relationalism. For a recent defense of the view, see e.g., North (2021). Second, the notions used in Wasserman (2016) are incompatible with eliminativist relationalism as well—at least inasmuch as the following principle is endorsed: if x exists at t, then t exists. Eliminativist relationalism about spacetime or time would threaten both formulations equally.

[8] The notion of an instant could be defined rigorously with the help of another primitive notion, that of *absolute temporal precedence*.

4. FUSION: x is the *mereological fusion* of the $yy =_{df}$ each of the yy is part of x and each part of x overlaps one of the yy.
5. PRODUCT: x is the (binary) *mereological product* ($\otimes$) of y and $z =_{df}$ x is the fusion of the things that are parts of both y and z.
6. ACHRONAL: r is an *achronal region* $=_{df}$ There is an instant t such that r is part of t.
7. PATH: $path_x$ is the path of an object, $x =_{df}$ $path_x$ is the mereological fusion of x's exact locations.
8. MAXIMAL ACHRONAL SUBREGION OF PATH: r is the mereological product of $path_x$ and an instant t that overlaps $path_x$.

(2)–(5) are standard mereological definitions. As for (6), an achronal region is simply a temporally unextended region—i.e., an *instantaneous* region. The path of an object (as defined in (7)) is its entire spatiotemporal career, so to speak. A maximal achronal region of a path (as defined in (8)) is the fusion of all parts in common between the path and an instant that overlaps it. The above is all we need in order to answer Wasserman, to which aim we now will turn.

3 A formulation of explanatory endurantism

Taking the lead from the pioneering works of Gilmore (2006) and Balashov (2010), we can proceed as follows. First, we define persistence in terms of the notion of a thing's path along with that of an achronal region, that is:

9. PERSISTENCE: x persists = $path_x$ is not achronal.

A characterization of endurantism as an explanatory claim can then be provided as follows:

10. BY ENDURING: x persists by being exactly multilocated at all and only the maximally achronal subregions of $path_x$.[9]

—where multilocation is[10]:

11. MULTILOCATION: x is multilocated $=_{df}$ There are (at least) two distinct regions r_1 and r_2 such that x is exactly located at both.[11]

Figure 1 provides an illustration.

The label BY ENDURING is exactly meant to mark the claim as explanatory—by Wasserman's own lights, as we shall argue.[12] Indeed, all we aim to argue is that it

---

[9] For a similar—yet, in context, arguably significantly different—characterization see e.g., Eagle (2016).

[10] We endorse the argument presented in Hudson (2006), Sattig (2006), and Gilmore (2007) among others to the point that multilocated entities are not exactly located at the fusion of their exact locations. This is arguably the standard position in the literature on multilocation. For a detailed formal treatment see Calosi and Costa (2015).

[11] See the discussion in Gilmore (2018).

[12] We are, for instance, aware that BY ENDURING would lead to somewhat counter-intuitive results in the case of time travel—whatever the take one might have on the relevance of intuitions for foundational issues in metaphysics. That being said, Wasserman's case does not rest on the subtleties of time travel scenarios. We are solely interested in challenging Wasserman's case here, for which aim BY ENDURING is well suited. See, e.g., Gilmore (2006, 2018) and Correia (2022) for a different take.
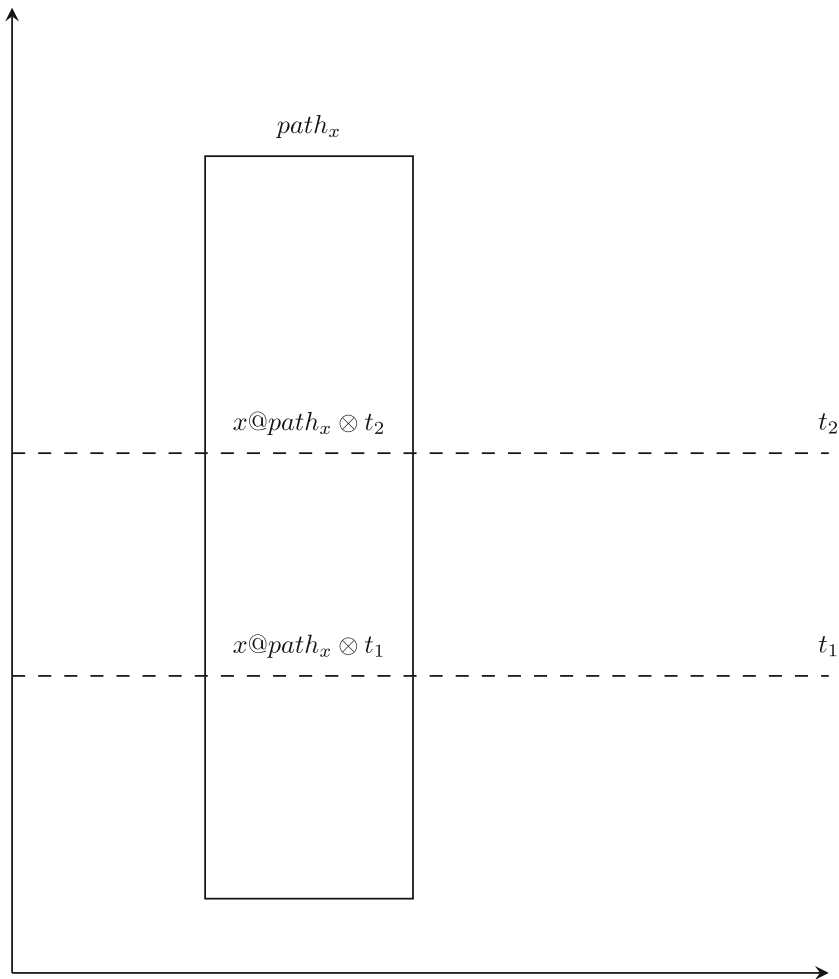
Fig. 1 x persists by enduring

does not fall prey to Wasserman's argument. In fact, that it does not should be clear by inspection of (10). On the face of it, (10) does not claim that x persists by persisting. So, whatever explanatory claim (10) offers, it is not circular. To phrase things differently, to persist is to "fill" a temporally extended (spatiotemporal) region. Given BY ENDURING, enduring objects persist (that is, fill a temporally extended region) by being (somehow) multiply located at different proper parts of that temporally extended region. This should be enough to conclude that enduring objects, as per BY ENDURING, do not persist by persisting. Also, (10) is not merely a refusal of the perdurantist's explanation of persistence either—an explanation that, according to Wasserman himself, boils

down to, roughly, dividing into temporal parts. So much so, that neither perdurantism nor temporal parts are even mentioned in (10).[13]

4 Varieties of endurantism

One might at this point protest that Wasserman's interest is really with (i) the notion of "being wholly present", and (ii) the rejection of temporal parts. Since (10) fails to mention either, it is thus unclear—so the objection continues—that offering BY ENDURING does not amount to changing the subject altogether instead of duly answering Wasserman. While we believe it does not amount to changing the subject, we will not push this line of argument here. We will provide definitions of "being wholly present" and of "temporal part", and different characterizations of endurantism in terms of those definitions, instead (in Sects. 4.1 and 4.2, respectively). Then, we will prove that BY ENDURING entails both such characterizations.

4.1 Endurantism and "being wholly present"

First, we provide a characterization of endurantism in terms of a locational definition of "being wholly present".[14] Here is our suggestion in this sense:

12. WHOLE PRESENCE: x is *wholly present* at instant t ($@_\blacktriangleleft$) $=_{df}$ x is exactly located at a part of t.[15]

    Now, WHOLE PRESENCE ENDURANTISM—as Wasserman himself should at this point concede—is captured by:

13. WHOLE PRESENCE ENDURANTISM: x persists by being wholly present at each instant that overlaps $path_x$.

    Figure 2 provides an illustration.

---

[13] One might think that the possibility of supersubstantivalism tips the scale in favor of Wasserman's "mereological understanding" of endurantism. This is becase, as is well known, multilocation is simply inconsistent with supersubstantivalism—see e.g., Schaffer (2009). However, at a further scrutiny, supersubstantivalism is at odds with Wasserman's mereological understanding of endurantism as well. Unrestricted Identity Supersubstantivalism, as Schaffer (2009) calls it, entails that objects are identical to regions of space or spacetime. Both of these are usually taken to perdure. The case of spacetime is straightforward. In the case of space it is well known that an enduring space is already in tension with—if not outright inconsistent with—classical physics, let alone relativistic physics. For an argument see, e.g., Maudlin (2012). This is enough, we take it, to show that Unrestricted Identity Supersubstantivalism puts extreme pressure not only on locational endurantism but on endurantism *tout court*.

[14] One might wonder what the relation between "being located at a region r" and "existing at a region r" is—where, for example, such a region is an instant t. Unfortunately, the notion of "existing at" used by Wasserman is mostly left unspecified. Therefore, it is difficult to establish whether, e.g., the following holds: if x exists at t, then x is (entirely) located at t. Cawling and Cray (2017) explicitly use a primitive notion of "existing at r", albeit in a different context. They are, however, explicit in denying the latter principle. Absent a more perspicuous characterization of the notion of "existence at r", we cannot conclusively establish any relation between that and location. And, we contend, in case this difference were ever a source of confusion, it would be on those who employ the notion of "existing at r" to provide a proper characterization of it and to specify its behavior. Thanks to an anonymous referee here.

[15] For a different definition of 'being wholly present' in purely mereological terms, see Costa (2020b). For a critical discussion, see Loss (2021).
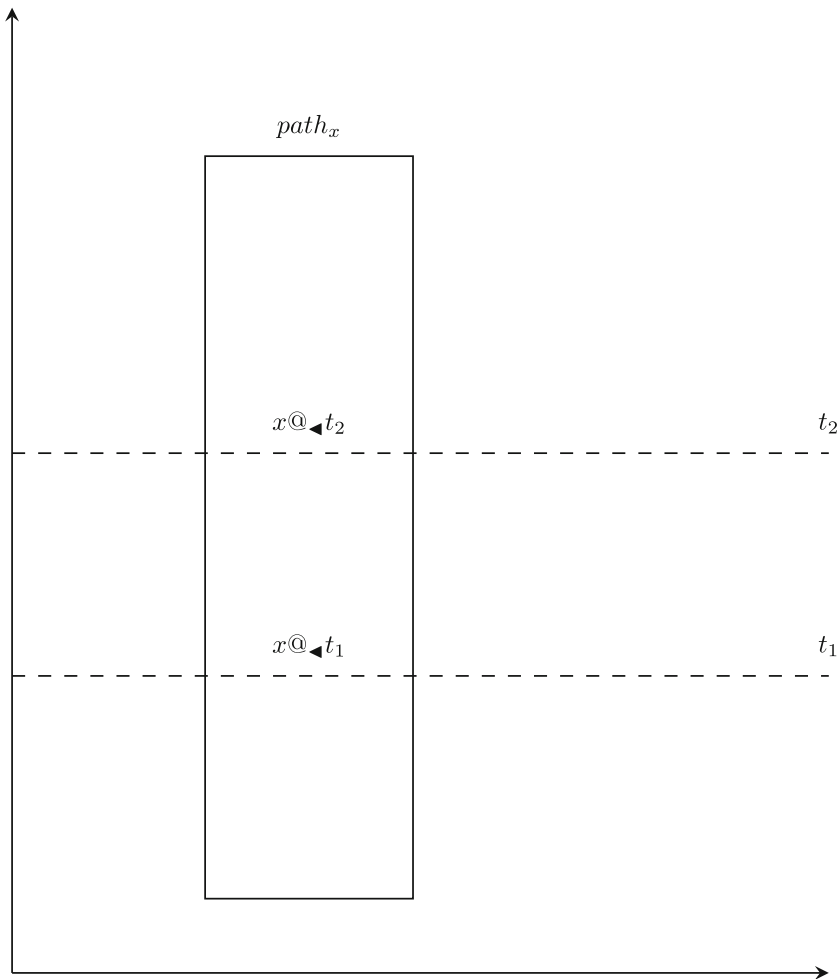
$path_x$

$x@_{\blacktriangleleft}t_2$ t_2

$x@_{\blacktriangleleft}t_1$ t_1

Fig. 2 x Persists by Being Wholly Present

Once again, it is clear by inspection that WHOLE PRESENCE ENDURANTISM does not offer a circular explanation of persistence. Nor does it merely refuse to endorse the perdurantist explanation. We can go a step further and show that:

14. BY ENDURING entails WHOLE PRESENCE ENDURANTISM.

The argument is straightforward—indeed it is of little "technical" interest, so to speak. However, as we shall see, it bears wide philosophical interest. Consider a *persisting object x*. According to BY ENDURING x is exactly located at every maximal achronal subregion r_i of $path_x$. Every such exact location r_i is the mereological

product of $path_x$ with an instant t that overlaps $path_x$. Therefore, any exact location r_i of x is a part of an instant t_i that overlaps $path_x$. It then follows that x is wholly present at each t that overlaps $path_x$. That is, WHOLE PRESENCE ENDURANTISM holds.[16]

---

[16] The diverse phrasings of endurantism—and, more generally, of persistence *tout court*—we offer all presuppose that persisting objects have exact locations that are parts of instants. But what if there are temporally gunky world, as investigated in, e.g., Stuchlik (2003) and Leonard (2018)? This possibility seems to challenge our proposals, for if time were gunky there would be no instants, and thus no exact locations for persisting objects to have. A detailed inquiry into such a scenario goes beyond the scope of this paper, since Wasserman (2016) does not discuss it either. It should be noted, however, that there are proposals in the literature which (i) employ locational notions and (ii) accommodate the absence of exact locations, even in the very case of temporal gunk—see, most notably, Leonard (2018) and Correia (2022). As a matter of fact, the account in Correia (2022) is engineered in such a way as to be equivalent to the account we propose whenever persisting objects have exact locations. What about Leonard (2018)? Leonard starts off with a primitive notion of *containment*. He takes containment as primitive for diverse reasons. One reason is that Leonard is interested in a case where enduring objects do not have exact locations because spacetime is gunky, and yet get to be somehow multilocated. Our present aim is to show that his proposal is equivalent to ours in the cases where enduring objects *do have* exact locations. We can thus simply define containment as follows: CONTAINMENT: x is contained in region $r =_{df} x$ is exactly located at a part of r. That is, containment is our *whole location*. Three points are worth noting: (i) this notion is different from Parsons's notion of entire location because it does not rule out multilocation; (ii) if x is exactly located at r, then x is contained in r, and finally (iii) containment is *monotonic*, that is, if x is contained in r_1 and r_1 is part of r_2, then x is contained in r_2. Leonard is not concerned with explanatory demands. He is therefore content with defining endurantism as WHITEHEADEAN MULTILOCATION: x endures $=_{df} x$ is contained in every maximal part of its path. As we said, he is primarily interested in cases of gunky spacetime where there are no instants—this is indeed the reason why enduring objects do not have exact locations. Thus, he first defines "Whitehedean instants" as limits of converging spacetime regions, and then characterizes maximal parts of a given region in terms of them. Once again, here we are only interested in cases in which there are instants— and therefore enduring objects have exact locations. Thus, the notion of a maximal part of a path can be easily defined: MAXIMAL PART OF PATH: r is a maximal part of $path_x =_{df} r$ is the fusion of mereological products of $path_x$ and instants t_i that overlap $path_x$. Equivalently, it is the fusion of maximal achronal parts of $path_x$—as defined in (8). It can be immediately checked that any such mereological product is a maximal part of $path_x$—as desired. Now, setting aside the explanatory element for the sake of simplicity, we need to prove that in spacetimes where there are instants that "provide" exact locations to enduring objects WHITEHEADEAN MULTILOCATION and WHOLE PRESENCE ENDURANTISM are equivalent. Let us start from the left to right direction. Suppose x endures according to WHITEHEADEAN MULTILOCATION. Then x is contained in every maximal subregion of $path_x$. As we noted, every mereological product of $path_x$ with an instant that overlaps it is one such maximal part. So x is contained in every such product. Containment is monotonic. Thus, x is contained in every instant that overlaps $path_x$. By definition, x is exactly located at parts of every instant that overlaps $path_x$, that is, it is *wholly located* at every such instant. Hence, it endures according to WHOLE PRESENCE ENDURANTISM. We then move to the right to left direction. Suppose x endures according to WHOLE PRESENCE ENDURANTISM. Then, x is basically exactly located at the mereological product of $path_x$ with any instant t_i that overlaps it. But note that every maximal region of $path_x$ is, by definition, an extension of one such mereological product. In other words, it has one such mereological product as part. As we pointed out, if something is exactly located at a region it is contained in that region, and containment is monotonic. It then follows that x is contained in every maximal part of $path_x$. That is, it endures according to WHITEHEADEAN MULTILOCATION. The argument establishes that, in the presence of exact locations for enduring objects, the accounts are indeed equivalent—if, to stress once more, explanatory requirements are set aside. If one aims to take into account such requirements instead, then one needs to recast WHITEHEADEAN MULTILOCATION in explanatory terms, perhaps by using, as we do, *by*-locutions. Thanks to an anonymous referee for pressing us on this point.

4.2 Endurantism and temporal parts

Wasserman explicitly relates "being wholly present" to not being divided into temporal parts. He sticks to Sider's definition of a temporal part, but one need not do that. Based on the following definition of an achronal temporal part:

15. ACHRONAL TEMPORAL PART: x is an *achronal temporal part* of y at t = (i) y is a persisting object, (ii) x is a part of y and (iii) x is uniquely exactly located at the mereological product of $path_y$ and t

    We are now going to prove that:

16. If BY ENDURING holds, then a persisting object x does not divide into temporal parts.

    The only further ingredient we need to establish (16) is principle (1) in Sect. 1, that is:

1. NO PART- WHOLE COLOCATION: If x is a proper part of y, then x and y have distinct exact locations.

Let us briefly discuss the principle. One may think that there are counterexamples to (1). Pickup (2016), for instance, defends the possibility of *unextended complexes*— roughly mereologically complex point-sized objects. To get a grasp of the idea, consider a very simple case. Suppose two point-sized particles x and y are colocated at point p. If so, then the sum z of x and y is an unextended complex. In this case, z and its proper parts, x and y, are all colocated at p, and violate (1). There are several things to say in response. First, the argument Pickup offers for the possibility of unextended complexes is controversial and has recently been challenged.[17] One could simply claim that it is more controversial than (1) itself. Second, there is a crucial difference between Pickup's "unextended complexes" case and the one we are discussing here. In the persistence case, there are no colocated disjoint things which then compose something that violates (1). In the case at hand, there is just one proper part somehow colocated with the whole. As far as our inquiry is concerned, we could simply add a conjunct to (1), so as to impose a further condition that specifies that there is no colocation of disjoint objects. However, it would make the formulation of the principle a little cumbersome. We will therefore stick to (1). As we said, the differences between our subject of inquiry and Pickup's make (1)—as it stands—immune to the unextended complex counterexample anyhow.[18] For a further potential counterexample, consider, e.g., a mereological bundle theory of tropes—that is, roughly, the claim that material objects are maximal fusions of tropes. If one such fusion contains more than one trope—so goes the argument—this makes for a counterexample to (1). However, we are restricting our attention to material objects alone here, in that mereological relations only hold between material objects or spacetime regions. Thus, we could easily offer a restricted version of (1), that is:

---

[17] See Calosi (2023).

[18] Thanks to an anonymous referee here.

(1*) For any two material objects x and y, if x is a proper part of y, then x and y have distinct exact locations.

In context, (1*) is both plausible and enough to underwrite the main argument. Having discussed (1) (and (1*)), we can turn to the argument. It goes as follows. Consider a persisting object x. According to BY ENDURING, x is exactly located at each and all maximal achronal subregions of $path_x$. Suppose now, *contra* (16), that x divides into achronal temporal parts, and consider one of them, say y—an achronal temporal part of x at t. Then, by (15), y is exactly located at the mereological product of $path_x$ and t. But this is a maximal achronal subregion of $path_x$. Call it r. r is also an exact location of x. Thus, x and y are colocated, i.e., have *the same exact location*. Now, x is a persisting object whereas y is not.[19] It then follows from (2) and (15) that y is a *proper part* of x. By (1), x and y are not colocated, i.e., *have distinct exact locations*. Contradiction. Thus, (16) is true.

The arguments above establish what follows: there are at least two plausible formulations of endurantism[20]—BY ENDURING in (10) and WHOLE PRESENCE ENDURANTISM in (16)—that, first, are not vulnerable to Wasserman's complaints, and, second, adequately capture the very notions Wasserman is interested in—i.e., whole presence and the rejection of temporal parts. In the light of the above we can circle back to something we claimed in Sect. 1. Wasserman (2016) contains a plea for yet another turn in the metaphysics of persistence, the "explanatory turn". The arguments in this paper can be read, in their broadest sense, as follows. Inasmuch as they welcome the explanatory turn, endurantists should embrace the locational turn. For phrasing their own view in locational terms gives them an excellent way to show that they do have an explanation of persistence to offer.

Hence our conclusion: Endurantism might very well be problematic, but not for the reasons Wasserman suggests. The time has not come to say goodbye to BY ENDURING.

Declarations

Conflict of interest The authors declare they have no conflict of interest.

References

Balashov, Y. (2010). *Persistence and spacetime*. Oxford University Press.

---

[19] Quick proof. It follows by definition that y has a unique achronal exact location. Hence its path is achronal. Hence it does not persist.

[20] We do not lay claim that these are the only plausible formulations. In effect, we think there are many others. For an introduction, see Costa (2020a).

Barker, S., & Dowe, P. (2003). Paradoxes of multilocation. *Analysis, 63*(2), 106–114.

Calosi, C. (2023). Extended simples, unextended complexes. *Journal of Philosophical Logic, 52*, 643–668. https://doi.org/10.1007/s10992-022-09683-3

Calosi, C., & Costa, D. (2015). Multilocation: Fusions and confusions. *Philosophia, 43*(1), 25–33.

Cawling, S., & Cray, W. (2017). How to be omnipresent. *American Philosophical Quarterly, 54*(3), 223–234.

Correia, F. (2022). A general theory of location based on the notion of entire location. *Journal of Philosophical Logic*. https://doi.org/10.1007/s10992-021-09641-5

Costa, D. (2017). The transcendentist theory of persistence. *The Journal of Philosophy, 114*(2), 57–75.

Costa, D. (2020a). Persistence in time. In *Internet encyclopedia of philosophy*. https://iep.utm.edu/per-time/

Costa, D. (2020b). Mereological endurantism defined. *Inquiry: An Interdisciplinary Journal of Philosophy*. https://doi.org/10.1080/0020174X.2020.1851759

Eagle, A. (2016). Persistence, vagueness, and location. *The Journal of Philosophy, 113*(10), 507–532.

Gibson, I., & Pooley, O. (2006). Relativistic persistence. *Philosophical Perspectives, 20*(1), 157–198.

Gilmore, C. (2006). Where in the relativistic world are we. *Philosophical Perspectives, 20, Metaphysics*, 157–198.

Gilmore, C. (2018). Location and mereology. In E. N. Zalta (Ed.), *The Stanford encyclopedia of philosophy* (Fall 2018 ed.). https://plato.stanford.edu/archives/fall2018/entries/location-mereology/

Haslanger, S. (1989). Endurance and temporary intrinsics. *Analysis, 49*(3), 119–125.

Hudson, H. (2006). *The metaphysics of hyper-space*. Oxford University Press.

Johnston, M. (1987). Is there a problem about persistence. *Aristotelian Society Supplementary, 61*(1), 107–156.

Leonard, M. (2018). Enduring through gunk. *Erkenntnis, 83*(4), 753–771.

Lewis, D. (1986). *One the plurality of worlds*. Blackwell.

Loss, R. (2021). Mereological endurantism and being a whole at a time: Reply to Costa. *Inquiry: An Interdisciplinary Journal of Philosophy*. https://doi.org/10.1080/0020174X.2021.1990797

Maudlin, T. (2012). *Philosophy of physics: Space and time*. Princeton University Press.

Mellor, D. H. (1980). *Real time*. Cambridge University Press.

North, J. (2021). *Structure and reality*. Oxford University Press.

Parsons, J. (2007). Theories of location. In D. Zimmerman (Ed.), *Oxford studies in metaphysics* (pp. 201–232). Oxford University Press.

Pickup, M. (2016). Unextended complexes. *Thought, 5*, 257–264.

Sattig, T. (2006). *The language and reality of time*. Oxford University Press.

Schaffer, J. (2009). Spacetime the one substance. *Philosophical Studies, 145*, 131–148.

Stuchlik, J. (2003). Not all worlds are stages. *Philosophical Studies, 116*, 309–321.

Wasserman, R. (2016). Theories of persistence. *Philosophical Studies, 173*(1), 243–250.