

# Ontological Dumpster Diving

## A search for a four-dimensionalist account of a person

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**Abstract** Throughout the literature on personal identity, the term ‘four-dimensionalism’ is poorly understood. Indeed, Mark Johnston deploys the concept of ontological trash to show that there is no feasible four-dimensionalist account of a person as an object entirely within spacetime, but he does not consider how any particular theory of spacetime or four-dimensionalism comes to bear on personhood. In this paper I will explain this line of reasoning, clarify four-dimensionalism, and show that there is a feasible account of personhood available on four-dimensionalism. In the introduction, I explain the concept of ontological trash and its threat to personhood. In the first section, I explain the concept of time dilation and use it, in conjunction with ontological trash, to prove that a person’s life does not have an unqualified temporal duration. In the second section, I summarise Cody Gilmore’s analysis of four-dimensionalism and explain how it comes to bear on persistence. In the third section, I sketch a new way to escape ontological trash in light of four-dimensionalism. In the fourth section, I apply this response to personhood, arguing that persons exist fully within spacetime and can withstand almost any psychological change. In the conclusion, I reflect on avenues for future research.

## 1 Persons and personites as ontological trash

Time is fleeting. Perhaps the most salient feature of a person’s life is how little time they have to live. Indeed, the recognition of time’s seemingly unjust imposition upon life helps motivate Mark Johnston’s argument that it is rational to hope that this life,

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confined to spacetime, is not all there is to one's existence.<sup>1</sup> His argument rests on the idea of ontological trash—i.e. a heap of nearly identical objects, all with equal claim to ontological priority. If we are ontological trash, so Johnston argues, then practical reason can be of no use to us. But practical reason *is* useful, so we ought to reject any account of personhood on which we are ontologically trashy, notably any four-dimensionalist account. In this introduction I will summarise Johnston's argument and motivate a closer look at four-dimensionalism. First, I will explain the concept of ontological trash, as well as the ontologically trashy version of a person: a personite. Finally, I will show how personites pose a threat to practical reason, and why this leads us to re-examine what it means for a theory of personhood to be four-dimensionalist.

A thing is ontological trash if in its nearest spatiotemporal vicinity there are many other things that are nearly identical to it, ontologically on par with it, and which all differ from it only in conditions of persistence.<sup>2</sup> Consider a fist as it exists through time. A fist comes into being when you clench your fingers all the way, and it ceases to exist when you unclench your fingers. On this way of looking at a fist, whenever you have a fist, you will also have a strew of other fist-like objects. There will be loads that are composed of the fist plus the fingers during the moments before they were clenched; there will be loads that are composed of the fist plus the fingers during the moments after they were unclenched; and there will be loads that are composed of the fist plus the fingers during the moments both before and after they were clenched. All of these objects are nearly identical to your fist; they are composed of the same stuff as your fist; and they differ from your fist only in their conditions of persistence. When you look at your fist it is therefore impossible to distinguish it from any of the other fist-like objects in its ontological trash heap.<sup>3</sup>

When it comes to persons, the ontological trash heap is piled high with personites. A personite coincides with a person and may share one but not two temporal endpoints with a person.<sup>4</sup> It could come into existence and cease to be somewhere within its person's lifetime; it could come into existence at a time later than its person's origin and cease to be when its person ceases to be; or *vice versa*. Because a personite is made up of exactly the same stuff as its person and because it differs from its person only in the sort of changes it can survive, a personite is very person-like. If persons just are sums of instantaneous person-stages over time, then there is one personite for every interval of time within a person's lifetime (i.e. infinitely many). If persons are instead chains of physically or psychologically continuous person-stages, then any parameter of the continuity relation (e.g. the degree of connectedness necessary for continuity or whether the chain is maximal or not) could be tweaked to produce hoards of person-

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1. Mark Johnston, 'Is Hope For Another Life Rational?' (Unpublished, 2017), 4.

2. *Ibid.*, 7.

3. *Ibid.*

4. Mark Johnston, 'The Personite Problem: Should Practical Reason Be Tabled?', *Noûs* 50, no. 4 (2016): 199.

ites.<sup>5</sup> The worry that Johnston elaborates is that any four-dimensionalist account of a person will take one of these two forms and thus will be unable to separate the person from the legion of personites with equal ontological status.<sup>6</sup>

Ontological trash is mostly nontoxic. For objects like fists ontological trash only gets in the way of our analysis. When you throw a punch the host of fist-like objects that swing with your first do not help you hit any harder. Practically speaking, there will be only one impact and it does not matter that a multitude of objects were responsible for it. However, objects like persons get a special moral status in virtue of being the kind of object that they are. We ought, *ceteris paribus*, to avoid causing persons undue or uncompensated harm; to respect the intentions and future interests of ourselves and other persons; and to act according to many other uncontroversial moral imperatives. We ought to act this way toward persons just in virtue of a certain property or properties of personhood. Anything that possesses the same properties should be respected in the same way. An ontologically trashy theory of personhood thus corrupts our moral framework because personites are too person-like for their interests to be neglected. Taking personites into our moral calculus leads to at least ten destructive consequences.<sup>7</sup> I will highlight one of them. A trip to the gym would torture the personites who exist entirely during the pain of physical exertion and who cannot be compensated after they have ceased to exist. Similarly, learning a language or undertaking any sort of long-term investment that involves short-term pain, frustration, or other harm will oppress some personites without compensation.<sup>8</sup> So it seems impossible to promote our own interests without being morally flagrant. Personites, as ontological trash, inevitably pollute our moral thinking.

We are, in fact, practical and rational creatures. From this strong intuition Johnston invokes 'a kind of pragmatic *a priori*':<sup>9</sup> that practical reason requires us to be able to make decisions about how to act, for otherwise we would be paralysed in deliberation. More specifically, in order to take any deliberate action, we are required to believe that we can avoid doing bad; that we can achieve some sort of good; and that we can use some form of ethics to guide our behaviour. But as we saw above, personites pollute our moral thinking, so practical reason demands that we reject any theory of personhood that yields personites. Because any four-dimensionalist account of personhood would yield personites, we are practically required not to believe it. Thus we can hold out hope that our existence is more than just our career in spacetime.

But what exactly does four-dimensionalism entail? Based on Johnston's use of the term, an object that exists four-dimensionally is one whose 'whole reality... is found within its spatiotemporal envelope.'<sup>10</sup> Cody Gilmore however has dedicated a paper to

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5. Johnston, 'Is Hope...', 7.

6. Johnston, *passim*, especially 'The Personite Problem'.

7. Johnston, 'The Personite Problem', 10.

8. *Ibid.*, 17–18.

9. Johnston, 'Is Hope...', 7.

10. *Ibid.*, 6.

disambiguating all the theories that go by this name, and spelling out which are supported by the relativity theory of spacetime.<sup>11</sup> With such confusion, one can hold out hope that there is still an account of persistence that is four-dimensionalist in the sense that it explains the reality of an object while keeping it fully in spacetime and without throwing it in ontological trash heaps. In the following sections, I will first explore the concept of persistence through time by highlighting how the relativity theory of spacetime reveals more ontological trash, then I will disambiguate four-dimensionalist theories of persistence and sketch a four-dimensionalist strategy for avoiding ontological trash altogether. After investigating persistence, I will return to personal identity to propose a definition of a person that keeps us fully in spacetime.

## 2 Relativity and a problem for persistence

Before diving into ontological trash, it is important to remember that physics should always bear on metaphysics. Since the current trend in physics is that we are living in a relativistic spacetime, any account of persistence through time should be expressed in a relativistic account of time. However, the relativity theory of spacetime is a very complicated field of study in itself; I can only hope to scratch the surface here. Nevertheless, in this section I will first lay out the basics of the relativity theory of spacetime, and then offer a new, relativity-based variant of ontological trash that reveals hoards of objects lurking on any account of persistence wholly in spacetime.

On the relativistic view of spacetime, neither time nor space are held as absolute constants. Instead, it is the speed of light that is invariable. Light, when measured by any observer, will move through a certain medium with a certain speed in meters per second. Accordingly, space and time give way in order to accommodate this fact. Imagine you have a very odd clock that consists of a laser gun, a thin pole of a known length, a mirror at the end of that pole, and a receptor attached to the laser. You press a button and the laser fires a beam of light, which travels the known distance to the mirror, where it bounces back and travels to the receptor to be absorbed. Since the speed of light is constant, since you know the length of the pole, and since speed is just distance over time, you can infer the amount of time, in seconds, that passed during the laser beam's journey. Whenever you fire the laser, you can trust that it will accurately measure how time passes for you.

Now suppose you have a friend who measures your clock while you move very quickly. Perhaps you are standing on the caboose of a train moving at a known speed along a set of straight tracks and your friend watches from the train station with binoculars as you fire the laser at a right angle to the train's path. From your friend's perspective, the distance of the laser beam's path is slightly longer than it is from your

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11. Cody Gilmore, Damiano Costa and Claudio Calosi, 'Relativity and Three FourDimensionalisms', *Philosophy Compass* 11, no. 2 (2016): 102.

perspective. From your friend's perspective, it has to travel not only the length of the pole, but also the distance the train has traveled before its journey can come to an end. But light moves at the same speed for both you and your friend, so when your friend uses the speed of light to infer the time it took for the laser beam to complete its journey, because the distance he measured is *greater* than the length of the pole, he will infer that *more* time, in seconds, has passed during the beam's journey from his perspective than would have passed from your perspective.<sup>12</sup>

This example rings like a paradox, but it will make more sense given the notion of a reference frame. A reference frame is a collection of objects that are all at rest with respect to each other. In the context of a certain reference frame, the classical intuitions about time and distance enter back into the relativistic view of spacetime.<sup>13</sup> In your friend's reference frame, the train moves quickly away from the station, while in your reference frame it is the tracks that move quickly underneath the train. Neither perspective can describe the example better than the other, but because the speed of light must remain constant, we are forced by the relativity theory of spacetime to accept that time passes differently in different reference frames. Thus, the amount of time through which any object persists will be relative to the reference frame in which it is viewed.

If all there is to existence is spacetime, then this last fact—that temporal duration is relative to reference frame—should offer hope for even more ontological trash. The looming threat of ontological trash should hold generally for all objects that persist four-dimensionally in the sense that their whole reality is within spacetime, but I will use the example of a person to flesh it out. First, suppose that every life has a temporal length: the amount of time that passes from a person's birth to their death. Now suppose something even less controversial:

(Leibniz's Law) 'Objects  $x$  and  $y$  are numerically identical only if they have exactly the same properties.'<sup>14</sup>

entailing that two persons can be identical only if they have the same temporal length.

Suppose that a person, Fred, lives for 80 years. Any person that is identical to Fred must also live for 80 years. In Fred's own reference frame, his watch will tick at a steady rate, and when it reaches 80 years he will expire, having had no trouble discerning whether he was one and the same person over the course of his life. But if a friend of his ever escorted him to a train station and waved to him as he sped away, the person

12. George F.R. Ellis and Ruth M. Williams, *Flat and Curved Space-times*, 2nd ed. (Oxford University Press, 2000), 28–29.

13. Cody Gilmore, 'Persistence and Location in Relativistic Spacetime', *Philosophy Compass* 3, no. 6 (2008): 1226.

14. Theodore Sider, 'Temporal Parts', in *Contemporary Debates in Metaphysics*, ed. Theodore Sider, John Hawthorne and Dean W. Zimmerman (Blackwell, 2007), 4.

the friend would have waved to, call him Fred\*, couldn't be Fred. For as we saw above, Fred\* will exist for slightly more time, as measured in the friend's reference frame, than Fred will when measured in his own reference frame. But then they wouldn't have the same temporal length, and by Leibniz's Law, Fred\* couldn't be the same person as Fred.

To be clear, Fred\* is not Fred, but he is definitely very Fred-like; he is made of the same stuff as Fred; and he differs from Fred only in conditions of persistence. In order to show that there is ontological trash lurking, all that remains to be shown is that there are many more things like Fred\*. To seek them out, consider that Fred\*, too, has a temporal length associated with his life:  $80 + x$  years, where  $x$  is a positive real number. Now consider the host of beings, Fred<sub>*n*</sub>, that are exactly like Fred except that their lives *at most*  $80 + nx$  years long, where  $n$  ranges through the natural numbers. These beings are not persons, since their lives do not have definite temporal lengths, but they are still very Fred-like (Fred<sub>1</sub> is identical to Fred\*, and Fred<sub>0</sub> just is Fred!), they are made up of the same stuff as Fred, and they differ from Fred only in conditions of persistence. As  $n$  increases, each Fred<sub>*n*</sub> will be able to survive the change to frames of reference that put him in motion for more and more time. In Fred's own reference frame, all of the Fred<sub>*n*</sub> coincide on him.

What could there be to make Fred ontologically superior to any of the Fred<sub>*n*</sub>? Without an answer to that question, it would seem like the relativity theory of spacetime turns Fred and all other objects whose existence is fully exhausted by spacetime into ontological trash. A simple change of reference frame is enough to change the properties of an object and introduce a hoard of ontological trash. But how could a change of reference frame, that is a change in the way one observes an object, actually change that object? Indeed, Johnston affirms this confusion when he sketches the concept of ontological trash in his paper 'On Being Ontological Trash.' He writes that it is not as if 'our more specific ways of looking at or conceiving of things *thereby bring other things into being*. Rather ... [they] select from among things that are already there. [italics in original]'<sup>15</sup> Change of reference frame should not change an object, so there should be no question as to whether the Fred<sub>*n*</sub> are identical to Fred. These beings seemed different only because they each had a different unqualified temporal duration. So instead of highlighting a new layer of ontological trash that envelops ordinary objects, Fred and the Fred<sub>*n*</sub> actually serve as a *reductio ad absurdum* to the conclusion that unqualified temporal length is not a property. Therefore, an account of persistence that keeps objects fully in spacetime is possible in a relativistic spacetime, so long as temporal duration is always relative to a reference frame. For the remainder of this paper, whenever I give an unqualified time or temporal duration associated with an object, *it should be interpreted as time relative to the reference frame where that object is at rest*.

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15. Mark Johnston, 'On Being Ontological Trash' (unpublished, 2017), 8.

### 3 The landscape of persistence

What other constraints might relativity place on an account of persistence that is four-dimensional in the sense that it keeps objects fully in spacetime? In 'Relativity and Three Four-Dimensionalisms,' Cody Gilmore explains how relativity comes to bear on two different four-dimensionalist views:<sup>16</sup> mereological perdurantism and locational perdurantism.<sup>17</sup> In this section I will explain what these two perdurantisms entail, why a relativistic spacetime points strongly toward the truth of locational perdurantism, and argue that locational perdurance is four-dimensionalist in the sense relevant to a four-dimensionalist account of persons.

It will be easier to understand perdurantism by contrasting it with its negation, endurantism. First, there is the domain of mereology, which is the study of how a whole is composed of its parts. Mereological perdurantism is the view that all complex objects are composed of temporal parts. An object mereologically perdures if and only if it is a series of achronal chunks, or object-stages, that succeed each other over time. Mereological endurantism, however, holds that objects do not have temporal parts. Instead, an object mereologically endures if and only if it is wholly present whenever it exists.<sup>18</sup> The heart of this side of the debate between perdurantism and endurantism is about which is more fundamental: an object's presence at each time it is present or its presence throughout its lifetime. A mereological perdurantist thinks an object's temporal parts explain its entirety, whereas a mereological endurantist thinks an object's entirety explains its presence at each time it is present.

Second, there is the domain of location, which concerns the precise region where an object is found. Locational perdurance is the view that material objects occupy only their whole spacetime path. So an object locationally perdures if and only if the single place it is located is the four-dimensional region that is its whole career, swept out through spacetime. Locational endurance, on the other hand, is the view that material objects occupy many different regions: the manifold achronal chunks of their path. So an object locationally endures if and only if it occupies many regions and each region it occupies is a three-dimensional slice of its path at a time. The crux of this side of the debate is over which sort of region is more fundamental for an object: its four-dimensional whole or its three-dimensional manifestations at times. The locational perdurantist believes that the four-dimensional region of an object's course through spacetime explains the smaller three-dimensional regions that that object has at different times, whereas the locational endurantist holds that an object's three-dimensional shape at the times when it is present explains the four-dimensional region it sweeps

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16. Gilmore, Costa and Calosi, 'Relativity...', 102.

17. Gilmore, 'Persistence and Location in Relativistic Spacetime', 1227.

18. Katherine Hawley, 'Temporal Parts', in *The Stanford Encyclopedia of Philosophy*, Spring 2018 edition, ed. Edward N. Zalta (2018), <https://plato.stanford.edu/archives/spr2018/entries/temporal-parts/>.

out.<sup>19</sup>

The issues of these two debates are quite similar, but they remain nevertheless independent. Likewise, relativity does not support both views in the same way. Gilmore presents detailed versions of the arguments from relativity theory to both forms of perdurantism in sections of 'Relativity and Three Four-Dimensionalisms'<sup>20</sup> and in 'Persistence and Location in Relativistic Spacetime',<sup>21</sup> but they require too much knowledge of spacetime geometry to present here. Instead, I will take his conclusions that it is very likely that space and time are not fundamentally separate entities,<sup>22</sup> and that this implies locational perdurantism.<sup>23</sup> Therefore, a locationally perdurantist account of persistence will be consistent with a relativistic spacetime.

Such a view also implies that the reality of an object might be wholly exhausted by its spatiotemporal extent. For what is there to push an object outside of its spacetime envelope if the region it occupies just is its spacetime envelope? An object *could* exist partially outside of spacetime and could locationally perdure in the sense that the region in spacetime that it occupies is its four-dimensional career through spacetime even though this region is not all there is to the object. But this is just one flavor of the view. Locational perdurantism is also consistent with both mereological perdurantism and endurantism. Relativity thus leaves two options on the table for an account of perdurance that keeps objects fully in spacetime.

## 4 Taking out the trash

Now that it is clear that there is wiggle room within relativity for an account of persistence that is four-dimensionalist in the relevant sense, the next task is to see whether such an account can also avoid ontological trash. When Johnston sketches out the concept of ontological trash, he considers two possible accounts of persistence through time, both of which are consistent with locational perdurantism. The first is a type of mereological endurantism, in that 'at each time [there are] a plenitude of co-extensive objects, each with a different condition of survival, some of which get teased out by this or that change.' The second is mereological perdurantism, where 'sequences or parades or cross-time sums of short-lived objects, temporal stages of [things]' compose complex objects.<sup>24</sup> In this section, I will present Johnston's arguments to ontological trash from mereological perdurance and from a common form of mereological

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19. Cody Gilmore, 'Building Enduring Objects Out of Spacetime', in *Mereology and the Sciences: Parts and Wholes in the Contemporary Scientific Context*, ed. Claudio Calosi and Pierluigi Graziani (Springer, 2014), 9.

20. Gilmore, Costa and Calosi, 'Relativity...', 11–14.

21. Gilmore, 'Persistence and Location in Relativistic Spacetime', 1299–35.

22. Gilmore, Costa and Calosi, 'Relativity...', 4.

23. Gilmore, 'Persistence and Location in Relativistic Spacetime', 1235.

24. Johnston, 'On Being...', 8.



endurance, and then show that amid the mereologically enduring ontological trash, there is always one object that can claim ontological supremacy.

Mereological perdurance straightforwardly entails that objects are ontological trash. First, consider a fist as a mereological perdurantist would see it. A fist only exists because a collection of a short-lived fist-stages succeed each other for a given interval of time. So whenever you have a fist, you will also have objects that are composed of all of the fist's temporal parts plus some temporal parts of the hand from right before it was clenched, from right after it was unclenched, or from both times. You will also have many objects that are composed of all of the fist's temporal parts except a couple from right after it was clenched, from right before it was unclenched, or from both. All of these objects are nearly identical with a fist; they are composed of the same stuff as a fist; and differ from a fist only in their conditions of persistence. Because they all overlap on your fully clenched fist, why are we to suppose we are looking at the maximal fist and not at any of its *doppelgängers*? Thus, persistence on mereological perdurantism is hopelessly ontologically trashy.<sup>25</sup>

The path to ontological trash from mereological endurantism is a bit less obvious. Suppose that fists cannot be reduced to temporal parts. Instead, a fist is a hand that is clenched all the way and it survives until the hand is unclenched to a lesser a degree. However, if this account correctly describes an object, then there is also the half-fist: a hand clenched half of the way that survives until it is either clenched more or unclenched, as well as the quarter-fist and eighth-fist and so on for every fraction of a fist. And there is nothing to rule out the definition of the at-least-half fist, which is identical to the half-fist but which can survive further clenching, and the at-least-quarter fist and so on for every fractional fist. So whenever you have a fist, you have a host of at-least fists which are all very fist-like; they are all made up of the same stuff: a hand with fingers rolled to a degree or range of degrees; and they differ only in conditions of persistence. Thus, even on a mereologically enduring view of persistence, there is ontological trash.

We should not hold out hope for finding a non-ontologically-trashy definition of a fist, but we can acknowledge that buried at the bottom of the trash heap there is an object upon which all the others are ontologically derivative: the hand. Why must we demand that the fist exist in its own right? It's not as if the hand disappears when we look at the fist. Rather, the fist seems like a phase of the hand's existence. In general:

If an object  $x$  is defined by possessing a property  $F$  continuously through time to degree  $d$ , where  $d$  could range through a plurality of values, the non-ontologically-trashy substitute for  $x$  will have  $F$  continuously through time *to any degree at all*.

This account will not render objects exactly as we expect them to be. We must wave

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25. Johnston, 'Is Hope...', 7.

goodbye to the idea of fists as ontologically basic. But only on this account can any object in the vicinity of the fist fully exist in spacetime and emerge from the ontological trash heap.

## 5 Salvaging the four-dimensional account of persons

With a four-dimensionalist account of persistence that avoids ontological trash, the path is clear to rescue the four-dimensionalist view of a person. In this section I will present such a view by adapting Derek Parfit's reductionist account of personhood<sup>26</sup> to the schema I introduced above, and then I will explain why this counterintuitive solution should make sense.

First, a word about Parfit's account. It is reductionist in the sense that it holds that all there is to personhood is the holding of other, more specific facts concerning psychological continuity and bodily continuity. Johnston adapts Parfit's view so that only psychological continuity is relevant to personhood and presents it as such:

A person  $x$ , considered at  $t_1$ , is numerically one and the same person as a person  $y$ , considered at  $t_2$ , if and only if the mental profile (the congeries of mental states and events) exhibited by  $x$  at  $t_1$  is  $D_o$  psychologically continuous with the mental profile exhibited by  $y$  at  $t_2$ ; (where  $D_o$  is construed as the [relevant] degree of psychological connectedness. . .)<sup>27</sup>

Johnston demonstrates that, on this account, although persons mereologically endure,<sup>28</sup> there are still personites in the form of continuity variants that are psychologically continuous to more restrictive or less restrictive degrees. Thus, on the psychological variant of Parfit's account we are ontological trash. Johnston acknowledges, however, that a 'continuity variant that places the least demands on connectedness, if there is such a one' would be the only way out of this case of personites. That way, 'all the other continuity variants. . . might be able to be construed as phases on such least demanding wholes.'<sup>29</sup>

My proposal is that a person just is that least demanding continuity variant. Put more precisely:

A person  $x$ , considered at  $t_1$ , is numerically one and the same person as a person  $y$ , considered at  $t_2$ , if and only if the mental profile (the congeries of

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26. Derek Parfit, *Reasons and Persons* (Oxford University Press, 1984), 207, quoted in Mark Johnston, 'Personites, Maximality And Ontological Trash', *Philosophical Perspectives* 30, no. 1 (2017): 225

27. *Ibid.*

28. *Ibid.*, 224.

29. *Ibid.*, 227.

mental states and events) exhibited by  $x$  at  $t_1$  is psychologically continuous to any degree at all with the mental profile exhibited by  $y$  at  $t_2$ .

Questions of survival in the classic cases of amnesia, teletransportation, fusion, and fission, as well as the possibility of a resurrection, should all be treated similarly under this view as they were under the psychological variant of Parfit's original view.<sup>30</sup> Parfit would not endorse my view, since he held that '[i]f there was only a single [direct psychological] connection,  $x$  [today] and  $y$  [yesterday] would not be on the revised Lockean view the same person,'<sup>31</sup> and this minimal psychological connection just is the criterion of identity on my account. However, if spacetime is all there is, then my account is a non-trashy, ontologically superior alternative to Parfit's account and Johnston's continuity variants.

Psychological connectedness, and therefore its ancestral relation continuity, does admit of degrees, but that is no reason to think that a stronger degree of connectedness enables some psychologically persisting entities to survive where other, more weakly continuous entities would cease to be. To get a sense for why this is so, imagine two persons, Joan and Joni. Suppose that there is a *trace amount* of psychological continuity between Joan considered at  $t_1$  and Joni considered at  $t_2$ , but not enough for Joan and Joni to be numerically one and the same. Perhaps this is a very severe case of partial amnesia. Joan's friends and family would certainly think that Joni is a ghost of the person they knew, and they would likely mourn the absence of Joan. But would Joni, a newly minted person, have to apply for citizenship? Should Joan's next of kin execute the final will and testament of their late beloved? And if Joni attempted to learn Joan's tendencies and to embrace Joan's personality, would she be at best an imposter for the real Joan who disappeared long ago? This borderline case should show that although our feelings about personhood respond to a minimum threshold of psychological continuity, falling below that threshold should not *actually constitute death*. Some very person-like thing does survive such a drastic change. What could it be other than that very person?

## 6 Conclusion

In this paper I have shown through a *reductio ad absurdum* that, in a relativistic spacetime, unqualified temporal duration is not a property; identified a version of persistence that is permissible in a relativistic spacetime and is properly four-dimensionalist in the sense it keeps objects fully in spacetime; given a four-dimensionalist account of persistence that avoids ontological trash; and finally, defended a definition of a person that persists in such a manner.

30. This view could even be supplemented with an additional clause about some sort of bodily continuity if evidence is found to suggest that bodily continuity should also matter in survival.

31. Parfit, *Reasons and Persons*, 207, quoted in Johnston, 'Is Hope...', 8

With such a resilient interpretation of what it is to be a person, we can coherently think of ourselves as objects whose existence is fully captured by our spacetime envelopes. We are surrounded by ontological trash (e.g. our fists) but we are not, ourselves, ontological trash. Thus, we can rescue practical reason from the personite problem without believing that part of us must be outside of spacetime. But in order to lift ourselves above the personites, we must admit that the single person seems to survive *too much*. All it takes to survive is a chain of continuity made of the weakest possible links of psychological connectedness. Assuming that Shoemaker's theory of psychological connectedness as causal dependence is the most tenable account, a robust theory of personal identity will explore the weakest sort of a causal dependence that still counts as psychological connected.<sup>32</sup> For instance, do mental states only transitively causally linked still count as psychologically connected? Consider a person's mental state at  $t_1$  when writing something down and their mental state at  $t_2$  when reading what they wrote. These mental states are ordinarily connected, e.g. in the case of a to-do list. Are they still connected if the person suffers amnesia between  $t_1$  and  $t_2$ ? How does this case differ from the relationship between the mental states of the writing author and the reading reader? Answering these and similar questions will lead us to a clearer picture of the new sort of personhood we should welcome on four-dimensionalism.<sup>33</sup>

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