Title

Worm-theoretic Persistence and Temporal Predication:
a reply to Johnston's Personite Problem

Abstract

Mark Johnston (2016, 2017) has raised concerns that a worm-theoretic account of persistence through time is incompatible with ethical singularity: that within the life of any actual person, there is only one morally considerable being, namely *that person*. To deny ethical singularity is to deny a core feature of our ordinary ethical and prudential thinking. The worm theory, Johnston concludes, proves to be "disastrous … for our ordinary moral outlook". This paper defends the worm theory from Johnston's argument. Though I agree that the worm theory must deny ethical singularity, it can nevertheless be squared with our ordinary ethical thinking by adopting a temporal counterpart analysis of temporal predication ('x will be F', 'x was previously F', etc.) for those morally considerable beings involved in a person's life that are *not* the person.

Word count: 2997

Introduction

Derek Parfit's discussion of personal identity challenges our ordinary belief that what matters in survival is identity.[1] David Lewis's response to Parfit is well-known: if we accept a worm-theoretic account of persistence through time, we can maintain the commonsense view that what matters is identity while also accepting Parfit's thesis that it's psychological continuity and connectedness that really matter.[2] More recently, Mark Johnston has raised concerns that Lewis's worm theory is not so congenial to commonsense; this metaphysics is in deep tension with our ordinary conception of ethics and practical rationality.[3] This essay addresses Johnston's argument and attempts to square commonsense belief with Lewis's worm theory.

In §1, I present the relevant details of the worm theory along with Johnston's case that it and our ordinary ethical and prudential outlook are in tension. The source of the problem is that the worm theory undermines ethical singularity: that within the life of any person, there is only one morally considerable being, namely *that person*.[4] My interest is not in challenging this stage of Johnston's argument. I agree that the worm theorist must deny ethical singularity. In §2, I begin my case that this isn't the problem Johnston thinks it is. To do this, I appeal to an alternative four-dimensionalist metaphysics, the stage theory, and its counterpart-theoretic account of temporal predication as developed by Ted Sider.[5] In §3, I argue that the worm theory has a theoretical need to incorporate this account of predication into their view and then go on to detail how it undermines Johnston's argument.

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[1] Parfit (1971, 1984)
[2] Lewis (1983a)
[3] Johnston (2016, 2017); cf. Olson (2010)
[4] Johnston (2016: 216; 2017: 641)
[5] Sider (1996, 2001)

§1 The Worm Theory and Johnston's Personite Problem

The worm theory is one version of four-dimensionalism. On this view, continuant material objects are four-dimensional entities or space-time worms, that is, aggregates or fusions of momentary temporal parts or stages.[6] Our ordinary talk of continuant persons and other persisting objects quantifies over these four-dimensional entities and not usually over the momentary stages which compose them. You and I are continuant persons, that is, we persist through time by virtue of having different temporal parts or person-stages existing at different times. Person-stages are united together into a single continuant person in virtue of being related to one another by way of some continuity relation R (e.g., bodily continuity, psychological continuity). As Lewis formulates this view, "Something is a continuant person if and only if it is a maximal R-interrelated aggregate of person-stages. That is: if and only if it is an aggregate of person-stages, each of which is R-related to all the rest (and to itself), and it is a proper part of no other such aggregate".[7] Since person-stages are central to the worm theory and my discussion of Johnston's argument, it's worth getting clear on what they are supposed to be.

Lewis explains,

A person-stage is a physical object, just as a person is … It does many of the same things that a person does: it talks and walks and thinks, it has beliefs and desires, it has a size and shape and location. It even has a temporal duration. But only a brief one, for it does not last long … It begins to exist abruptly, and it abruptly ceases to exist soon after.[8]

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[6] Sider defines a stage as follows: x is a momentary temporal part or stage of y at some instant t if and only if x exists at and only at t, x is a part of y at t, and x overlaps at t everything that is part of y at t (Sider 2001: 59).
[7] Lewis (1983a: 60)
[8] Lewis (1983a: 76)

By 'person-stage' Lewis means *the briefest temporal part* of a person.[9] Moreover, by 'person-segment' I shall mean a *non-maximal* aggregate of R-interrelated person-stages. Andrew-during-grad-school is a person-segment but so is Andrew-this-morning-before-coffee. Lewis maintains our ordinary predicate 'x is a person' applies only to *maximal* aggregates of R-interrelated person-stages and not to person-stages or person-segments.

Despite person-segments not being persons, we may wonder whether they are nevertheless morally considerable beings, that is, beings who have moral standing. Let us restrict our attention to those person-segments whose temporal extent is long enough to "exhibit a developing individual personality".[10] Johnston argues that such person-segments are intrinsically similar to possible persons. Since persons are morally considerable beings, it follows that these longish person-segments are also morally considerable beings.[11] Johnston dubs the longish person-segments of any actual person 'personites'. Personites are "shorter-lived very person-like things that extend across part, but not the whole, of a person's life".[12]

This argument shows that on the worm theory ethical singularity is not just an underestimate, but a *radical* underestimate, of the number of morally considerable beings within

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[9] How brief? Since it will not impact the discussion that follows, we can keep it vague: it's very brief. Katherine Hawley (2002: 50 – 53) argues that stages must be as fine-grained as possible change. Moreover, if ordinary material objects have three-dimensional shape properties such as *being spherical*, there must be things which are three-dimensional. The worm theorist understands these three-dimensional objects to be the stages that compose the continuant objects we quantify over in ordinary discourse.

[10] Johnston (2016: 200)

[11] The argument runs roughly as follows: (p1) For any possible world w and possible object x, if x is a person in w, then x is a morally considerable being in w. (p2) For any possible worlds w and v and possible objects x and y, if x in w is sufficiently similar in its intrinsic features to y in v, then x in w is a morally considerable being in w iff y is a morally considerable being in v. (p3) For any actual longish person-segment x, there is a possible object y in world w such that y is a person in w and is sufficiently similar in its intrinsic features to x. Therefore, (c) any actual longish person segment is a morally considerable being. See Johnston (2016: 203 – 204).

[12] Johnston (2016: 199)

the life of any actual person.[13] Andrew is the maximal aggregate of R-interrelated person-stages whose first stage exists at some time in '84 and whose last stage exists (hopefully!) at some time in the distant future. But there also exists one of Andrew's personites, a non-maximal aggregate of R-interrelated person-stages whose first stage is identical to Andrew's '84 stage but whose last stage is identical to Andrew's last stage during his graduate studies. Shorten or lengthen that person-segment and we get very many other personites besides. For any actual person, there are many numerically distinct morally considerable beings involved in their life.[14] Consequently, ethical singularity is false.

Johnston raises several different issues for the worm theory but each one depends on the fact that a person and its personites have differing temporal extent. Andrew chooses to attend graduate school and knows it will challenge him. He expects there to be many nights agonizing over term papers, not to mention the pain and suffering involved in dissertation writing and grading undergraduate essays. Yet, he has good reason to believe the hardships he's choosing to bring upon himself will pay off in the future: doing philosophy for a living promises to make the remainder of his life a happy one. This kind of choice is familiar and ordinarily believed to be morally unproblematic. As Johnston says, prudential self-sacrifice "seems to be the backbone of any minimally well-ordered life".[15] Part of the rationale for this judgment is that it is Andrew who

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[13] Kasierman (2019: 218) argues that the stage theory can resist Johnston's argument for personites. The stage theorist should deny (p3): no actual person-segment is sufficiently intrinsically similar to a possible person since, on this view, persons are person-stages and not maximal fusions thereof. Thus, Johnston's personite problem is only a problem for the worm theory. However, David Brink (1997: 111 –116) argues that the stage theory is incompatible with elements of rational egoism. Though for the reasons discussed later in regards to how temporal predication works for this view, I do not think Brink's arguments are successful. See Hawley 2002: 65 – 67) for similar remarks.
[14] Perhaps infinitely many if time is dense or continuous. Hawley (2002: 51) touches on this point. But see also Johnston (2017: 637 – 641).
[15] Johnston (2017: 623)

has assumed the costs and it is Andrew who *will* reap the benefits. All of this is true on the worm theory since Andrew is a four-dimensional object who has temporal parts existing at both the time of the costs suffered and the benefits received. Ordinarily, we would assume that no other morally considerable being is involved in Andrew's prudentially-driven choice. But this is not so if ethical singularity is denied.

Consider again Andrew's personite, call it Andrew-minus, whose first stage is Andrew's first stage but whose last stage is Andrew's last stage during his graduate studies. This personite will not reap any of the benefits from the choice to attend graduate school but it is around to suffer all the hardship. And Andrew-minus is not the only morally considerable being in this position. Very many other of Andrew's personites do not include any post-graduate school stages; so, they too suffer the costs and *will* not receive any of the future benefits. If Andrew attends graduate school, he will be "pressing all those personites into a scheme which significantly benefits [him], but imposes a real cost on them … for which they are not compensated by way of any subsequent benefit".[16] On this basis, Johnston argues that Andrew's prudentially-driven choice is morally objectionable. The kind of choice which is the backbone of a minimally well-ordered life would, on the worm theory, seem to be "steeped in great wronging!".[17] The personite problem is "disastrous … for our ordinary moral outlook".[18]

In the following sections, I argue that a worm theorist can and should deny Johnston's claim that personites like Andrew-minus *will* not receive any compensating benefits.[19] My case

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[16] Johnston (2017: 623 – 624)
[17] ibid.
[18] Johnston (2016: 206)
[19] Johnston discusses several responses on behalf of the worm theorist: an appeal to consent (2017: 631 – 632), an appeal to versions of consequentialism where the number of morally considerable beings does not matter (2017: 635 – 641), and an attempt to deny personites moral standing (2016: 202 – 203). How successful any of these

for this depends on extending a counterpart-theoretic account of temporal predication for person-stages to personites. Johnston's case that the worm theory threatens our ordinary ethical outlook depends on some personite involved in a person's life suffering *uncompensated costs*. If this is false, Johnston's case will prove unsuccessful.

§2 The Stage Theory and Counterpart-theoretic Temporal Predication

The stage theory is another version of four-dimensionalism. On this view, continuant material objects are not aggregates of momentary temporal parts or stages but *the stages themselves*.[20] The stage theory differs from the worm theory by claiming that our ordinary talk of persons and other persisting objects quantifies over momentary stages and not usually over the four-dimensional objects which are composed of those stages.[21] One immediate objection to the stage theory is that if you and I are person-stages, we are not *continuant* persons and do no persist through time. After all, a person-stage is very brief, "it begins to exist abruptly, and it abruptly ceases to exist soon after".[22] The stage theorist accepts that there is a sense in which you and I do not persist through time: it is false that you and I exist at more than one time. However, the stage theorist maintains there is another sense of persistence: you and I exist now, we *will* exist in the future, and we *previously* existed in the past.[23] Stage-theoretic persistence

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objections are and whether Johnston's responses are sufficient is not pertinent to the task of this essay. Instead, I want to engage with Johnston's argument from a different direction.

[20] For a defense of stage theory, see Sider (1996, 2001) and Hawley (2002).

[21] Sider (1996, 2001) accepts stages and fusions of stages but this is not required by the stage theory. Hawley (2001: 52) seems to accept a version of stage theory that does not (or need not) endorse fusions of stages. The discussion that follows assumes Sider's version of the stage theory.

[22] Lewis (1983a: 76)

[23] Sider (1996: 446). Sider goes on to claim, "All that can be counted part of common sense is that objects typically have temporal properties (like existing ten minutes ago), and the stage view is consistent with this part of common sense. Further claims about the analysis of such properties are theoretical, not part of common sense, and so a theory that looks best from the perspective of a global cost-benefit analysis is free to employ a non-standard analysis of temporal predication" (Sider 1996: 447).

consists in the conditions under which tensed sentences such as 'x will exist in the future', 'x previously existed in the past', etc. come out true. The analysis of this sort of temporal predication is central to the view.

Stage theorists provide a counterpart-theoretic analysis of temporal predication. A tensed sentence such as 'Andrew was once a graduate student' is analyzed as meaning that there is some past person-stage x such that x is a graduate student and x is R-related to Andrew (where the R-relation is your favored continuity relation).[24] In other words, Andrew was once a graduate student because Andrew has a past "temporal counterpart" that is a graduate student where Andrew's temporal counterparts are those person-stages R-related to Andrew.[25]

Consider how this account handles the temporal predications relevant to Johnston's argument. Suppose Andrew is the present person-stage suffering the hardships of graduate school. Although Andrew is identical neither to any future person-stage who receives the benefit nor to any past person-stage who made the choice to attend, it is nevertheless true that Andrew *will* receive the benefit and that he *previously* made the choice because he has a temporal counterpart that receives the benefit and one that made the choice. Person-stages (and so persons) have temporal properties or satisfy temporal predicates in virtue of the properties of their temporal counterparts, that is, those past and future person-stages R-related to them.

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[24] Sider (1996: 438). It is worth stating for the sake of thoroughness that the analysis assumes the B-theory of time which is the conjunction of eternalism and a reduction of tensed talk to tenseless talk. For the most part, I leave tensed talk in the truth-conditions for temporal predications unreduced. See Sider (2001: Ch. 2).

[25] Relatedly, a stage's satisfaction of a so-called lingering predicate – one which it takes time to satisfy – has to be analyzed as the instantiation of a relation to its temporal counterparts. It is true that Andrew is thinking about Vienna because he stands in an appropriate network of counterpart relations to other stages with appropriate features. See Sider (1996: 449 & 2001: 198). The same holds true for Hawley's version of stage theory. She writes, "True, an isolated stage could not satisfy such [lingering] predicates … But an instantaneous stage can satisfy such predicates if it is suitably surrounded by and related to other stages with appropriate properties" (Hawley 2002: 54). In fact, Hawley argues that most sortal predicates including 'x is a person' require the satisfaction of lingering predicates.

§3 The Worm Theory and Counterpart-theoretic Temporal Predication

On the worm theory, talk of persons normally quantifies over the maximal aggregates of R-interrelated person-stages and not the stages or segments that are proper parts of these four-dimensional objects. So, the counterpart-theoretic analysis of temporal predication isn't needed for our ordinary talk of persons having temporal properties. For example, the tensed sentence 'Andrew was once a graduate student' is analyzed as meaning that Andrew has a past temporal part that is a graduate student. In general, temporal predications to persons are understood in terms of stages or segments at appropriate times having the right properties. It seems, then, we have no reason to apply a counterpart-theoretic analysis of temporal predication to talk of persons. However, I argue there is a theoretical need for the worm theorist to extend counterpart-theoretic temporal predication to talk of *personites*.

Let's first apply the account to the predications relevant to Johnston's argument. His case that the worm theory threatens our ordinary ethical outlook depends on some personite involved in a person's life suffering *uncompensated costs*. Although Andrew-minus suffers the hardships of graduate school, it has no post-graduate school stages and so it *will* not receive any compensating benefits. As I will argue below, since Johnston's argument invites us to consider person-segments, the relevant temporal predication should be given a non-standard analysis such as the counterpart analysis. The sentence 'Andrew-minus will *not* receive any compensating benefits' should be analyzed as meaning that there is no future personite x such that x receives a compensating benefit and x is R-related to Andrew-minus. In other words, Andrew-minus has no future temporal counterpart who benefits. But this is false: there is some temporal counterpart of Andrew-minus that receives a benefit, namely any of Andrew's personites who

include happy, philosophizing post-graduate school person-stages. Similar to the stage theory, a worm theorist should hold that some of a personite's temporal properties are had in virtue of the properties of their temporal counterparts, those personites R-related to them.

Is there independent motivation for extending this account to personites? The need for such an account arises given that the worm theory gets the intuitively wrong verdict in some cases of *synchronic counting*. If no person-stage is ever part of more than one person, then counting persons at a time and counting stages then will always agree. However, part of the theoretical benefit of adopting the worm theory is its solution to the problem of fission. As we would ordinarily describe it, fission is where *one* person "divides" into *two* persons. Yet, according to the worm theory, our intuitive count before fission is wrong. What we have prior to fission is a *single person-stage* shared by *two* continuant persons. The worm theory seems forced to say that we bungle a case of synchronic counting.[26]

Lewis explains our intuition that there is one person before fission by admitting that sometimes we do not always count by identity. Ordinarily, when we ask 'How many persons?', we are asking 'How many *numerically distinct* persons?' but sometimes such questions invoke a relation weaker than identity, say, *identity-at-t*.[27] In these contexts, we end up counting stages rather than persons. Moreover, if the worm theorist is forced to admit we sometimes count by a relation that isn't identity, it seems arbitrary to insist that it is only ever *identity-at-t*. Other relations weaker than identity also explain our intuition that there is only one person before

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[26] Similar issues with synchronic counting may arise in cases of time travel. If I were to travel back in time to visit my past self in graduate school, the worm theorist says that I have more than one person-stage at that past time. We have here a *single* person talking to himself. Yet, there is some intuitive pull to describe the scenario as involving *two* persons (though I think the intuition is less strong than in cases of fission). See Lewis (1976) for discussion.
[27] Lewis (1983a: 63)

fission. We may count person-segments by counting by *identity-over-a-period*. If the relevant period is pre-fission, we'd get the same answer as counting by *identity-at-t* for times before fission. Synchronic counting demands a partial retreat: in this context, the worm theorist has to construe talk of "persons" as involving quantification over stages and segments.

In contexts where we are *counting* stages or segments, we may also wish to say something about the entities we've counted. We may want to ask and answer questions that concern their temporal properties such as 'Will Andrew be either of the post-fission persons?' (where 'Andrew' picks out a pre-fission stage or segment). I submit this generates a need for a *non-standard account* of temporal predication: in such contexts, some of our temporal predications to "persons" must be analyzed in a way different from the standard account offered by the worm theorist for the more usual contexts where quantification is over maximal aggregates of R-interrelated person-stages. The counterpart-theoretic analysis is well-suited to fulfill this role.[28] Independent of replying to Johnston's argument, the worm theory should apply a counterpart-theoretic account of temporal predication to person-segments and thus to personites.

I believe this consideration is bolstered when we recognize that a parallel need arises for the stage theory in cases of *diachronic counting*. If we ask from a timeless perspective 'How many people have been speaking during the last ten minutes?', the stage theory has some explaining to do. Since persons are person-stages, there have been very many persons speaking during this

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[28] Where the context involves quantification over stages or segments and so the proper name 'Andrew' refers to one or other of these entities, the sentence 'Andrew will be a post-fission person' should be analyzed as meaning there is an x such that x exists after fission and x is R-related to Andrew. Assuming whatever happens in fission preserves the R-relation, it is true that Andrew will be identical to a post-fission entity. In fact, Andrew will be each post-fission entity. There's no incompatibility with transitivity here since the counterpart relation that makes it true that Andrew will be each post-fission entity is not identity. See Sider (1996: 438 – 439).

period.[29] This, of course, does not agree with our intuitive count. In these contexts, our talk of "persons" quantifies over maximal aggregates of R-interrelated person-stages rather than the stages themselves.[30] Since we count the spacetime worms and not their stages, we may want to talk about the entities we've counted and ascribe them temporal properties. In such contexts, the stage theory should help itself to the standard account of temporal predication provided by the worm theory. Both versions of four-dimensionalism need to recognize *contextual shifts* in the objects we quantify over in our talk of persons and this opens the door for a non-standard analysis of temporal predication to the relevant entities in such contexts.

Conclusion

A worm theorist can and I think should agree that ethical singularity is false: there are very many morally considerable beings involved in the life of any single person. However, Johnston's argument that the worm theorist's denial of ethical singularity threatens our ordinary ethical outlook depends on some personite involved in a person's life suffering *uncompensated costs*. I've argued that this portion of Johnston's argument is not successful. The worm theory proves resilient to Johnston's personite problem if a counterpart-theoretic account of temporal predication is extended to our talk of personites.

It is worth clarifying that the counterpart-theoretic account applies only to *some* of a personite's temporal properties. Consider, for instance, one of Andrew's personites whose temporal extent is longer than Andrew-minus' and includes some of the happy, philosophizing post-graduate school stages. Call this personite 'Andrew-minus+'. The sentence 'Andrew-minus+

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[29] Perhaps infinitely many. See fn. 14.
[30] Sider (1996: 448)

will *not* receive any compensating benefits' should be analyzed in the standard worm-theoretic fashion, namely as meaning that Andrew-minus+ has no future stage that receives a compensating benefit. This, of course, is false and its falsity does not concern any temporal counterpart of Andrew-minus+. In general, I believe the worm theorist will have to recognize that their account of temporal predication to personites will be *disjunctive in character*: a personite P will be F iff either P includes a future F-stage or one of P's future temporal counterparts includes an F-stage.

This may not be, however, a serious drawback despite its theoretical untidiness. Lewis in his discussion of temporary intrinsics insists that some things have properties like shape *without qualification*.[31] This is meant to contrast with other things that have shape *with qualification*. For the worm theorist, I am bent-shaped with qualification because I have a stage that is bent-shaped without qualification.[32] So, there is a sense in which predication for the worm theorist is already disjunctive in character: for any material object, o, in the worm theorist's ontology, o has a shape property F iff either o is an aggregate of o-stages and some o-stage is F without qualification or o is a stage and is F without qualification. Predication is untidy business with a four-dimensionalist.

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[31] Lewis (1983b: 202 – 204)

[32] As a four-dimensional object whose has both bent and straight-shaped stages, I am both bent and straight with qualification. But this is no contradiction since I am bent in virtue of one set of bent-shaped stages and straight in virtue of a non-overlapping set of straight-shaped stages.

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