

Personal Identity, Substantial Change, and the Significance of Becoming

Michael Otsuka¹ 

Received: 18 November 2016 / Accepted: 31 August 2017 / Published online: 22 September 2017
© The Author(s) 2017. This article is an open access publication

Abstract According to philosophers who ground your anticipation of future experiences in psychological continuity and connectedness, it is rational to anticipate the experiences of someone other than yourself, such as a self that is the product of fission or of replication. In this article, I concur that it is rational to anticipate the experiences of the product of fission while denying the rationality of anticipating the experiences of a replica. In defending my position, I offer the following explanation of why you have good reason to anticipate the experiences of your post-fission successor but not your replica: in the former case, you *become* (i.e., *substantially change into*) somebody else, whereas, in the latter case, you are merely *replaced* by somebody else.

1 Introduction

It can be rational for you to anticipate the experiences of someone other than yourself. Among the philosophers who advance this claim are those who ground your anticipation of future experiences in causal relations of psychological continuity and connectedness between your present self and future selves. For them, it would be rational for you to anticipate the experiences of someone else who is the product of your binary fission or of your vaporization and replication, so long as you know that the aforementioned causal relations will obtain between you and this other person (see Parfit 1986, 1995; Shoemaker 1984). In this article, I concur with these philosophers that it is rational for you to anticipate the experiences of the

✉ Michael Otsuka
m.h.otsuka@lse.ac.uk

¹ Department of Philosophy, Logic and Scientific Method, London School of Economics, Houghton Street, London WC2A 2AE, UK

product of your fission while denying the rationality of anticipating the experiences of your replica. In defending my position, I offer the following explanation of why you have good reason to anticipate the experiences of your post-fission successor but not your replica: in the case of fission, you *become* somebody else, where this is to be understood as your ‘substantial change’ into another; whereas, in the case of replication, you are merely *replaced* by somebody else.¹

2 Fission and Substantial Change

I need to set the stage with a brief presentation of a well-known sequence of thought experiments.

First imagine that your entire cerebrum is transplanted into the skull of your identical twin at midnight and the rest of your body is destroyed.² Most would say, and it is reasonable to believe, that you persist—i.e., continue to exist—beyond this operation and end up where your cerebrum goes.³

Now imagine that one cerebral hemisphere is destroyed and the other is transplanted into the skull of your identical twin at midnight, thereby replacing his *entire* cerebrum. (Again, the rest of your body is destroyed.) Let us suppose that a single hemisphere will function just as effectively as the two together. It follows that if one of your cerebral hemispheres is destroyed, while the other remains intact and in good working order, then you will continue to exist and go on living as you would have if both hemispheres had remained intact. This case is not relevantly different from the first case in which your entire cerebrum is transplanted into his empty skull. As in the first case in which you end up where your cerebrum goes, it is reasonable to believe that you persist beyond this operation and that you end up where your one cerebral hemisphere goes.⁴

Now imagine that one of your cerebral hemispheres is transplanted into the empty skull of one identical triplet siblings and the other hemisphere is transplanted into the empty skull of your other entirely de-cerebrated identical triplet sibling. Both cerebral hemispheres are transplanted at midnight. Again, the rest of your body is destroyed.⁵ Will you persist beyond this midnight operation in this case of binary fission? In other words, will there be someone after midnight who is *identical* to you—where “you” refers to whomever is reading these words before midnight?

¹ Since this appeal to *becoming* as substantial change versus mere *replacement* seems to me such a natural explanation of the difference between fission and replication, I am surprised not to have encountered it in the literature on personal identity.

² This case traces back to Sydney Shoemaker (1963, p. 22). On his rendering, the entire brain, rather than merely the cerebrum, is transplanted.

³ Not everyone would say this. Neither animalists such as Paul Snowdon (1991) or Eric Olson (1997) nor those such as Judith Jarvis Thomson (1997) who embrace a bodily criterion of identity would say this.

⁴ This second case was conceived by David Wiggins (1967, pp. 55–56). Wiggins, however, expresses doubt as to whether personal identity is preserved in this case.

⁵ This case was introduced into the literature by Wiggins (1967, pp. 52–56). Discussions of this case can also be found in Derek Parfit (1971; 1986, §§89–90; 1995, pp. 41–44) and Shoemaker (1984, pp. 84–85, 117–118, 120–121).

For familiar reasons that I shall sketch in this paragraph, it is difficult to deny that, after midnight, there are two distinct persons in the fission case—call them Lefty and Righty—each of whose lives is sustained by one of your cerebral hemispheres. One might entertain the thought that you are a single person who continues to exist as *each* of them. But this is implausible. For, as Derek Parfit (1995, p. 42) explains, since Lefty and Righty “would be two different people, it cannot be true that each of them is me. That would be a contradiction. If each of them was me, each would be one and the same person: me. So they could not be two different people.” One might say that you continue to exist beyond this operation, but as only one of Lefty or Righty. If, say, you persist as Lefty, then Righty is a brand new person who was brought into existence at the moment of the transplant. But, since Lefty and Righty are symmetrically situated, there appears to be no foundation in reality to the claim that you continue to exist as one and not the other. Alternatively, one might say that you persist beyond this operation as a single person that consists of both of them—as a single two-headed and -bodied person, each half of which looks and acts like a distinct person that is free to go its separate way, ignorant of the existence of its other half—a single person that has no mental life above and beyond what goes on in the heads of each of its disconnected, fully functional parts. This strikes many as incredible.⁶ One can offer other accounts on which you continue to exist past midnight, but they each have their costs.⁷ Rather than any of the preceding accounts, I believe that the most defensible description of what happens in this case of fission is that you are a single person who ceases to exist at midnight, at which point two new people just like you—Lefty and Righty—come into existence.⁸

I would like to draw attention to the fact that this description of the above case corresponds to a natural description of what happens when an amoeba splits. We would not make the contradictory assertion that the amoeba continues to exist as each of its two offshoots, neither of which is identical to the other. Nor would we say that the pre-fission amoeba continues to exist as but one of them, perhaps as determined by a flip of some cosmic coin. Nor would we say that the amoeba persists beyond its division, but as a single being with two parts, each of which goes its separate way. Rather, we would say that the pre-fission amoeba goes out of existence upon splitting and that two new amoebas come into existence.

I maintain that, in both the case of your binary fission and of the splitting amoeba, one thing goes out of existence and becomes (i.e., substantially changes into) *each* of two *distinct things* without becoming (i.e., substantially changing into) the two *taken*

⁶ For further discussion of the incredible nature of this claim, see Parfit (1986, pp. 256–257) and Peter Unger (1990, pp. 264–265).

⁷ On David Lewis’s (1976) four-dimensionalist account of persons as space–time worms, for example, you persist as two persons after midnight. Such persistence, however, is bought at the cost of having to accept that there were also two persons all along from birth to midnight fission, who share all the same temporal stages.

⁸ Ted Sider’s (1996, esp. Section 6) four-dimensionalist account of persons as temporal stages implies this description of what happens at midnight. But it has difficulties in accounting for other intuitions regarding the fission case: e.g., that you were a single person, pre-fission, who existed at more than one time prior to division.

together. The ordinary division of the cell of a non-twinning one-celled zygote provides a contrasting case of something that goes out of existence and becomes the two cells into which it divides. It is important that I am not talking about the zygote, which persists as the same thing throughout the division of its cells. Rather, I am talking about the cell of the zygote.⁹ It is plausible to say that the one cell becomes two cells *taken together* because the two cells form a unity by constituting the same zygote that the one cell formerly constituted.¹⁰ We should distinguish what the one cell becomes in this case from what a cell becomes in the case of monozygotic twinning where a single cell divides into two distinct and separated cells, each of which constitutes a separate zygote. There is a resulting disunity in this latter case. There is also a resulting disunity in the cases of a splitting amoeba and your fission into Lefty and Righty.¹¹ That is why one becomes each without becoming both in these three cases of zygotic twinning, amoebic splitting, and your binary fission.¹²

The concept of a *substantial change* traces back to Aristotle ([c. 350 BC] 1982). In my own application of this concept to the topic of personal identity, I draw, however, on the more recent writings of E. J. Lowe, who notes (2006, p. 276) that a substantial change is to be distinguished from the more familiar notion, and frequent event, of a *qualitative change*, “which occurs when the same object—or, to use an older terminology, the same *individual substance*—undergoes a change in respect of its qualities or properties; for example, when it changes in shape or colour”. By contrast, he maintains (2006, p. 276) that “a *substantial change* occurs when an individual substance either comes into or goes out of existence, that is, when it is either created or destroyed: for example, when a living creature dies”. The verb ‘becomes’ is employed to indicate a qualitative change. It is, however, also

⁹ Jeff McMahan (2002, p. 27) and Simon Evnine (2016, p. 170) each distinguish this cell from the one-celled zygote or organism on grounds that the cell ceases to exist upon division whereas the zygote or the organism persists.

¹⁰ There are reasons to deny that the cells form such a unity during the first 2 weeks following conception. See McMahan (2002, pp. 27–28). In order to draw the contrast I would like to make, we can, however, suppose that there is more differentiation of cells and coordination and coherence among them than is actually the case during this period.

¹¹ Compare McMahan (2002, p. 28): “Unlike a series of amoebas, where division produces daughter cells that may wander off to lead quite independent lives, the zygotic cells and their progeny form a discrete unit.”

¹² There is a sense, captured by Wiggins (2001, p. 73 n. 14), in which the one amoeba becomes the two taken together:

One amoeba becomes two amoebas. But here ... the verb ‘becomes’ receives an analysis making it correspond to the ordinary ‘becomes’ in the same way in which the constitutive ‘is’ corresponds to the ordinary ‘is’ of predication and identity. The matter of the original amoeba—the ‘it’—is the fusion, or the matter, of the two new ones taken together. There is matter such that first *a* was constituted of it, and then *b* and *c* were constituted of it.

What Wiggins says about amoebas is consistent with what I have said about them. I can grant that the one amoeba becomes the two together if what we are here talking about is what becomes of the matter that constitutes first the one and then the two. That is consistent with the one thing’s—the first amoeba’s—becoming each of two other amoebas without becoming both of them, where what we are talking about is the substantial change of the thing itself rather than the tracing of its matter. There is no thing constituted by both of the resulting amoebas that the one amoeba becomes. What we say is consistent because there are two different senses of ‘becomes’ in play—the one of constitution and the other of substantial change.

employed to indicate a substantial change in which one thing goes out of existence and one or more new things come into existence that are created from the parts of the first thing. So it is said, in a case of the substantial change to which symmetrical fission gives rise, that “one object becomes two” objects, where what is meant, and what I shall mean throughout this article, is that “one object ceases to exist and two new objects are created from its parts” (Lowe 2002, p. 35). In addition to the amoeba, Lowe (2002, p. 35) offers, as an example of symmetrical fission, “that of a single water drop dividing into two distinct water drops”. As these and other examples such as the death of an animal show, substantial as well as qualitative change is “accepted as commonplace in the metaphysical scheme embodied in our everyday ways of talking about the world” (Lowe 2006: 276).¹³ In spite of this fact, the concept of substantial change has received surprisingly little attention in contemporary metaphysics.¹⁴ I believe, and shall try to show in this article, that this notion can shed light on the rationality of anticipating the experiences of someone other than oneself, to which I now turn.

3 Substance-Connected Concern

Assuming that you are forewarned of your impending fission in the case I described above, should you anticipate the experiences of your post-fission successors and be concerned about their fates? Along with many other philosophers, I would maintain the following. Even though you would not continue to exist beyond midnight, the prospect of your division should be regarded as akin to the prospect of ordinary survival in which you continue to exist as one and the same person. You should, for example, dread the prospect of the torture of Lefty or Righty after midnight as you would dread the prospect of your own torture after midnight. You should feel one and the same type of concern about Lefty’s or Righty’s impending torture as you would about your own.

These claims gain support by means of an appeal to a split-brain case and a variation on that case. First imagine that your corpus callosum is severed but your brain remains intact within the skull and experimental conditions are created so as otherwise to isolate the two hemispheres, thereby giving rise to two streams of consciousness. Then you are tortured by the prodding of your left and right legs with hot irons. In this case it is appropriate, in advance of this split of your brain, to anticipate and dread the impending proddings. This sort of dread would remain appropriate even if we change the case so that these isolated hemispheres are removed from your skull and rapidly transplanted into the different skulls of the different bodies of Lefty and Righty, whose legs are then prodded with hot irons. It would not be sensible for your dread to vanish simply upon learning that the neurons and fibres in the two hemispheres that are associated with pain will be activated only

¹³ In addition, Wiggins (2001, pp. 64–69) offers and discusses the Biblical example of Lot’s wife: “But his wife looked out from behind him [Lot] and she became a pillar of salt.”

¹⁴ There is a large body of literature on the relation between the statue and the lump of matter of which it is composed, but surprisingly the notion of substantial change hardly figures in this discussion.

after these hemispheres have been removed from your skull and placed in other skulls. The dread in the transplant case would no longer be of your own torture, but rather of Lefty's and Righty's. But it would remain just as well-justified as the dread of your own torture.

In accounting for these intuitions and others I shall report below, I maintain that the only person apart from you for whom you can legitimately feel this type of concern is someone else who you will *become*, where such becoming involves the substantial change that occurs when one thing changes into at least one other thing that comes into existence and is non-identical to it. If you are not mistaken about who you will be or become, it would be inappropriate for you to feel this type of concern for persons who are *distinct* from you in each of the following two senses—persons who are neither identical to you nor other persons who you will become. Although there would probably be a word that denotes this type of concern in the language of a race of persons whose members frequently split into two in the manner I have described above, there is no such word in English. I shall therefore coin the term 'substance-connected concern' to denote a concern for the individual with whom you are identical (i.e., the same substance) or who you will become (i.e., substantially change into).

You can, of course, also feel a more detached concern for what will happen to persons who are neither identical to you nor individuals who you will become. Substance-detached concern can easily be stronger than substance-connected concern. You might prefer that you be killed or tortured rather than your child. Nevertheless, the substance-connected concern that a parent would feel regarding his own torture, or the torture of someone else whom he will become in a fission case, is different from the substance-detached concern he would feel regarding his child's torture. There would not be the same sort of dread and apprehension in anticipation of an experience of something in the latter case.

One moral of this story is that the boundary that separates the sort of concern you feel about your own future torture from that of your child does not map onto the boundary that separates yourself from other people. Rather, it maps onto the boundary that separates you and those, if any, who you will become from those that are distinct from you in both respects.

4 Fission Versus Replication

Now imagine that at midnight a machine scans your body from head to toe and records all the information about the type and location of each of its molecules. Then, from this blueprint, it immediately constructs two replicas of your body out of different matter which conforms precisely to this blueprint. Unfortunately, the scanning process has the side-effect of (painlessly) vaporizing your entire body (including your brain).¹⁵

¹⁵ This case is McMahan's (2002, pp. 58–59). It is a variant of a case of single replication that is due to Parfit (1986, p. 199).

Unlike in the fission case that we discussed earlier, it is intuitive for many, including me, that it would not be rational to anticipate the experiences (or the activities and achievements) of your replicas in this case. Assuming that you understand the process of replication correctly, you would not dread a replica's torture in the way that you would dread your own torture. Your fear of being vaporized would not be compounded by any fear of being tortured after your vaporization. And if you were told that, shortly after midnight, a replica would have a candlelit tryst in a hotel room with the movie star that you've been pining after your whole life, you would be filled with envy rather than anticipation. You would try to talk the scientists into delaying the replication process for just a few hours.

I believe that the following provides a good explanation of these intuitions. There is no question that you do not continue to exist beyond such double replication. You do not continue to exist for all the reasons you do not persist in the case of fission. Moreover, you do not continue to exist for all the reasons you do not persist beyond the vaporization of your entire body. You also do not *become* anybody else after midnight. All that happens is that you are eliminated and two merely type-identical persons are instantly put in your place. You're nothing more than the prototype of your replicas—the person on whom your replicas are modelled. Even though your replicas are causally dependent on you, you're not related to these persons in the way that is necessary to justify substance-connected concern.

The crucial difference between fission and double replication is that, in the former case, you *become* each of two other persons, whereas, in the latter case, you are merely *replaced* by two others. Moreover, in the fission case, the relation of becoming that you bear to each of the persons is about as secure a grounds for anticipation of the experiences of these two persons as is the relation of identity that you would have borne to yourself and your own future experiences were you to have continued to exist past midnight. The same cannot be said about the relation of mere similitude that you bear to the persons who merely replace you when you are vaporized and replicated.

The following distinguishes your division from your destruction and replication—a *part* of you persists past midnight in the former but not the latter case. Moreover, you become—i.e., substantially change into—someone else at midnight *only if* a part of you persists as a part of that other self.¹⁶ In the case of your fission into Lefty and Righty, a part of you—your left cerebral hemisphere—splits to the left, and a part splits to the right. Each cerebral hemisphere persists beyond transplantation as part of a different body, and you *become* each of two different people. In the case of your destruction and replication, by contrast, no part of you persists to become a part of the replica, and you do not become anyone else.

¹⁶ This is a necessary condition of your becoming someone else, where this is understood as an episode of substantial change. But now suppose a sequence of episodes of substantial change: suppose that *a* becomes *b*, which in turn becomes *c*, even though *a* and *c* share no parts. This sequence does not violate the necessary condition, since there is no episode of substantial change in which *a* becomes *c*, and it is therefore inappropriate to say that *a* becomes *c*. It is also strictly speaking false to say that *a* will become *c*, since only *b* will become *c*. There is, however, a loose sense in which *a* will become *c*, where by that we mean that *a* will become something that will become *c*. In this article, I largely sidestep the question of the appropriateness of substantial concern for someone from whom you are separated by more than one episode of substantial change as in the case of that which separates *a* from *c*.

Even though I have claimed that it is appropriate to feel substance-connected concern *only* for yourself or for that which you will become, I do not claim that it would be appropriate to feel substance-connected concern for *whatever* you will become. You might, for example, become nothing more than a work of art composed of your corpse. It would not be appropriate for you to feel substance-connected concern for that work of art. You might be frozen and the hydrogen, oxygen, and carbon atoms which constitute you removed one by one and reconstituted into a replica of yourself. Even if it is correct to say that you have become this replica, it would not be any more appropriate for you to feel substance-connected concern for this replica than it would be to feel substance-connected concern for a replica made of entirely different matter from the matter that once constituted you. The mere fact of your becoming something else is not sufficient to make it rational to anticipate anyone else's experiences. The same, however, is true of identity: the mere fact of continued existence is not sufficient to make it rational to anticipate your own future experiences. It is insufficient because a plausible account of personal identity should be able to accommodate the possibility of continued existence as the same individual being, but in a permanent and irreversible vegetative state that renders all further conscious experience impossible.

I believe, however, that it would be appropriate for you to feel substance-connected concern for each of who you will become if, as in the fission case, two fully functional parts of your brain, each of which is at present part of a unified consciousness but each of which is also capable of animating a distinct person on its own, is transplanted into two distinct bodies. Your brain provides the underlying basis for substance-connected concern because it is the *physical realizer of your psychology*, which I conceive of, and shall henceforth refer to, as your *mind*.¹⁷ I propose the following necessary and sufficient condition for your becoming each of two new persons for whom, in the case of each person, it would be appropriate for you to feel substance-connected concern: two parts of your mind—each of which is at present part of a unified consciousness but each of which is also structured so that it is fully capable of animating a distinct person on its own—continue to exist and each go on to animate a person. On this account, it would be appropriate for you to feel substance-connected concern for the two persons you become—i.e., substantially change into—when your mind *also* becomes—i.e., substantially changes into—two minds, in the manner just described. In explaining your concern for your post-fission successors, the notion of becoming, where this involves substantial change, does double-duty, at the level of the mind as well as the person.

Our understanding of what it is for one thing to become another in the case of substantial change depends on our understanding of what it is for a thing to continue to exist as the same thing. This is because the parts of things whose persistence figures in the account of substantial change are themselves things rather than

¹⁷ I am indebted to Unger (1990, pp. 106–110) for the notion of a physical realizer of one's psychology. Following Unger (1992, pp. 133–134), I maintain that such a physical realizer can persist even if it does not realize your "distinctive psychology", which involves things such as "your personal memories, your constellation of intentions, your peculiar character traits, and so on", and it realizes only your "core psychology", which consists "only of things like your capacity for conscious experience and your capacity for very simple reasoning" and hence "is exactly like that of even the dullest amnesiac moron".

processes or events. They are things such as brain hemispheres in the fission case or the planks of wood of the ship of Theseus, which provides one of Lowe's examples of the parts of one thing out of which a new thing is created in a manner involving substantial change. We therefore remain within what Lowe (2002, p. 232) calls the "category of *persisting object, substance, or thing*—in the narrow sense of 'thing', in which we restrict this term to such items as trees, rocks, animals, stars, and atoms".

Your replica is causally related to you in a manner that gives rise to memories (or quasi-memories) of your experiences and a character, convictions, and desires like yours. There is therefore a sense in which a part of you, namely your psychology, continues to exist in the replica to enable him to carry on with your life where you leave off in much the manner that you would have. But this part of you is not a 'thing' in the narrow sense referred to above. Rather, it falls under a different category of ontology involving events and processes, which figure in the psychological account of what matters, to which I shall now turn.

5 The Psychological Account

Parfit and other proponents of what is known as the psychological account of "what matters in the prudential sense" maintain, as I do, that it is rational to anticipate the experiences of your post-fission successors in the case I described in Sect. 2.¹⁸ But they would also claim, which I have denied, that it is rational to anticipate the experiences of your replicas in the case I described in the previous section.

On the psychological account, what rationally justifies your anticipation of the experiences of someone in the future is a psychological continuity and/or connectedness between you and that person. Psychological continuity is a causally-based relation that consists of a temporally overlapping chain of psychological connections that extends from a person at one point of time to a person at another point in time (see Parfit 1986, §78). A given psychological connection is a "direct causal connection between a mental state in a person at a certain time and a suitably associated mental state in a person, the same or another, at another time" (Unger 1990, p. 71). Connections involving memories (or quasi-memories) of past experiences are especially relevant.

Suppose that one adopts their view that what justifies your anticipation of some future episode of pain is a chain of causal connections that extends from you at the present to the being who will experience that episode in the future. One is then faced with the fact that these chains can connect you to your replica just as surely as they can connect you with yourself in the future or your post-fission successors. In the case of the connection to your replica, the causal chains are not all produced in the ordinary way by means of processes in the brain. Rather, at the point of replication, the causal connections are produced by a different means which involves the vehicle of a machine which scans and then produces a perfect copy of your brain. But why—as adherents such as Parfit (1986, Chs. 10–13) and Shoemaker (1984,

¹⁸ The quoted phrase is from the online abstract of Ch. 12 of Parfit (1986).

pp. 108–111, 130–132) of the psychological account ask—should it make a difference to your concerns that the causal processes flow, for a time, through the wires and silicon chips of a machine rather than the electro-chemical processes of our neurons and synapses? This question becomes hard to answer once one has become convinced that your dread of future episodes of pain is justified by nothing other than the causal relations of psychological continuity and connectedness that link you to whoever experiences these episodes and therefore not at all justified by the fact that the person who will suffer this episode of pain is either identical to you or someone who you will become.

Once, however, we introduce the hypothesis that what rationally justifies your anticipation of this future episode of pain is the fact that you will either be or become this person, we can understand why it makes such a difference whether the causal chains run through parts of your own brain throughout or through wires and silicon chips at some point. It makes such a difference because the latter process involves a destruction of your brain and the rest of your body that rules out your being or becoming the person with whom you are nevertheless psychologically connected. It therefore takes us outside of the ontology of things in the narrow sense that persist through time and crosses over into an ontology of events and processes.

Why should we prefer my view that you have reason to anticipate the fate of whichever sentient being you will be or become to the psychological account that you have reason to anticipate the fate of any being with whom you will be related by a continuous causal chain of psychological connections? We should prefer my view over the psychological account on the grounds that it provides a better explanation of various intuitions regarding what we have reason to anticipate and care about.¹⁹

For one thing, my view explains why you are justified in anticipating the fate of your post-fission successors just as well as does the psychological account. Fission cases, therefore, do not mandate the adoption of that view over mine. Moreover, my view delivers the intuitive answer that you have no reason to anticipate the fate (for example, to dread the pain) of your replica rather than the counterintuitive answer that you have just as much reason to dread your replica's fate as you have to dread your own fate or that of your post-fission successor. So my view does no worse than the psychological account in explaining widespread intuitions regarding one central case in the literature on personal identity and better than theirs in explaining fairly widely held intuitions regarding another central case.

There is an additional respect in which my view more fully accommodates intuitions about what we have reason to anticipate than does the psychological account. According to that account, the individual in Bernard Williams's (1970, pp. 167–168) famous example has no reason to anticipate and dread waking up in extreme pain after a brain operation that induces total experiential memory amnesia and a completely different personality and eliminates all other psychological

¹⁹ In saying this, I do not maintain that someone who endorses the psychological account would try to defend it on grounds that it best explains such intuitions. At least in Parfit's case, the view he defended was intended to be a radical revision, rather than an explanation, of such intuitions.

connections between the person before and the person after the operation.²⁰ It seems plausible to maintain, however, that you would have reason to anticipate and dread this even though you are fearing what will happen to someone who is not psychologically connected to or continuous with you. My own account, by contrast, is compatible with the claim that it is appropriate to feel dread in Williams's case.²¹

Finally, there is the following further respect in which my view more fully accommodates intuitions about what we have reason to care about than does the psychological account. Parfit has famously argued that it will make sense to revise various attitudes about your fate once you come to realize that the all-or-nothing fact of being identical to that person is not what grounds your anticipation of and concern regarding what will happen to someone, but rather what grounds these is simply the extent of one's psychological continuity and connectedness with that person. Once you reflect on the implications of this revelation, Parfit maintains that you will conclude that you should be less concerned about whether there will be someone in the future identical to you and about what will happen to any such future self. Parfit (1986, pp. 281–282) writes:

After my death, there will be no one living who will be me. I can now redescribe this fact. Though there will later be many experiences, none of these experiences will be connected to my present experiences by chains of such direct connections as those involved in experience-memory, or in the carrying out of an earlier intention....

Instead of saying, 'I shall be dead', I should say, 'There will be no future experiences that will be related, in certain ways, to these present experiences'. Because it reminds me of what this fact involves, this redescription makes this fact less depressing. Suppose next that I must undergo some ordeal. Instead of saying, 'The person suffering will be me', I should say 'There will be suffering that will be related, in certain ways, to these present experiences'. Once again, the redescribed fact seems to me less bad.

Such a reorientation of our attitudes towards ourselves, and the accompanying reorientation of our attitude towards others, would be quite radical, and not all of its implications would be as welcome as the ones that Parfit identifies in this passage (see Wolf 1986 and Adams 1989). My own account, by contrast, would not involve such a radical reorientation of our attitudes, since I retain, rather than discarding and replacing, the belief that we have reason to anticipate the future experiences of a person with whom we will be identical, where this reason is grounded in the fact of identity. I also maintain that we have analogous reason to anticipate the experiences of who we would become in hypothetical cases involving binary fission, where this reason is grounded in the fact of becoming. On my view, the fact that someone in the future is identical to you continues to provide considerable reason to anticipate and be concerned about the fate of that person even if the psychological connections

²⁰ Similarly, McMahan (2002, p. 65) contends that it would be rational for someone in the early stages of Alzheimer's disease to dread being in great pain in the final stages even if he also believes that someone in such pain will not be psychologically continuous with the person in the early stages.

²¹ It is appropriate because the physical realizer of one's psychology persists. See n. 17 above and text to that note.

between you and that person are tenuous. Admittedly, you would not have as much reason as you would have if you were strongly psychologically connected, but the fact of identity provides considerable reason nevertheless. Analogously, the fact that a person in the future is someone you will become provides considerable reason above and beyond facts of psychological continuity and connectedness to care about that person on my account. My account better explains why our concern doesn't fade out and become attenuated in the way that it would if all that grounded such concern were psychological continuity and connectedness. On my account, "because it's me" would still provide an appropriate (albeit perhaps ungrammatical) answer to the question of why you should be so concerned about the fate of this person 40 years from now who will probably share so little of your beliefs and convictions and remember so little about your present life. Moreover, "because it's the person I will become" would play the same role in answer to the question of why you should be concerned about the similarly remote future of one of your post-fission successors.

6 Filling an Explanatory Gap

My own position regarding what one has good reason to anticipate contrasts not just with the revisionary view that psychological continuity and connectedness rather than identity or becoming are what ground our concern regarding future experiences. It can also be distinguished from the attempts of others such as Mark Johnston and Peter Unger to vindicate the traditional view that what we care about is identity.

Mark Johnston (1997, p. 171) has argued that the reorientation of our attitudes that Parfit advocates "is not a reasonable adjustment because it is much more radical than" what is called for by the fission case. Parfit employs "a false apparatus of generalization" that draws unwarranted lessons from this case. Parfit therefore stands accused of violating Quine's "maxim of minimum mutilation". Johnston does not, however, claim, as I have, that you should care about the fate of your post-fission successor because that is the person who you will become. Rather, Johnston (1997, pp. 171, 179 n. 28) advocates a "move to locally modified concern", according to which "[w]e are to organize our concerns around personal identity, and in those cases [such as fission] in which it is only sort of true or partly true that personal identity holds, we are to extend identity-based concern". Johnston (1997, pp. 169–172) claims that fission is analogous to ordinary identity-preserving survival because and insofar as it contains "a significant core of the relations which constitute identity". He maintains that our concern about our post-fission successors is "parasitic on the importance of identity". Similarly, Unger (1992, p. 264) maintains that fission cases approximate but fall short of what we care about in ordinary identity-preserving survival: "in the fission case, although there is *much* of what (prudentially) matters in my survival, there is not all of what matters. And, second, it is because I do not survive that, in this fission case, there is *not all* of what matters in my survival."

What their views lack, however, and what my account provides, is an explanation of why the fission case should be regarded as so close to cases of identity in which we continue to exist as the same person, and why cases involving replication should be regarded as falling so far short of preserving what matters in identity. The closeness of the fission case to identity-preserving cases is explained by the fact that both of them are oriented around a substance-connected concern—which replication fails to meet—that there be at least one being in the future who you will be or become, where the former involves preservation of substance whereas the latter involves substantial change. The concerns are both oriented around an ontology of things rather than one of events and processes.

Jeff McMahan's "Embodied Mind" account of what matters in cases involving fission and replication suffers from a similar explanatory gap which my account can fill. McMahan maintains, as I do, that most everything that grounds your anticipation of future experiences in case of ordinary identity-preserving survival is also secured in cases involving your division via brain hemisphere transplants, while also denying, as I do, that this is secured in cases of replication. But he offers a different account from mine of when such anticipation is justified.

His account of your concern for your post-fission successors places no emphasis on the significance of the fact that you will *become* each of these successors. Rather, McMahan (2002, p. 67) proposes that "what provides the basis for egoistic concern about the future" is "continuity or sameness of consciousness," by which he means "continuity of the *capacity* for consciousness, so that the renewed appearance of conscious states following a period of unconsciousness is always the reappearance of the same consciousness, or the same mind".²²

Sameness of consciousness or mind can, however, at best provide a sufficient, but not a necessary, condition for rational concern regarding future experiences. It cannot provide a necessary condition, since it fails to explain why it is rational, in the case of your division, to anticipate the experiences of Lefty and Righty. There is only one mind and one field of consciousness before division, and there are two numerically distinct consciousnesses and minds after division. Therefore, for precisely the reasons, having to do with the transitivity of identity and the like, that neither Lefty nor Righty can be the same *person* as you, neither consciousness or mind can be the same as yours. Lefty's and Righty's consciousness or mind would each be a continuation of yours, but neither of theirs could be the same as yours.

Perhaps in the light of this difficulty in explaining the concern one has regarding the fates of one's post-fission successors, McMahan's considered view (2002, pp. 67–68) involves a broadening of his account of rational concern to the following:

the basis for an individual's egoistic concern about the future—that which is both necessary and sufficient for rational egoistic concern—is the physical and functional continuity of enough of those areas of the individual's brain in

²² McMahan (2002, p. 67) maintains that the "notion of the 'same consciousness' is equivalent to the notion of the same mind... a particular mind continues to exist only if enough of the brain in which it is realized continues to exist in a functional or potentially functional state".

which consciousness is realized to preserve the capacity to support consciousness or mental activity.

In the case of your division, there is such continuity between yourself and each of your post-fission successors.

But why, in the case of your division, should your concern for future selves track such continuity of capacity for consciousness or mental activity in the absence of identity, either of person, capacity for consciousness, or mind? And why should such concern be lacking in cases such as replication, where there is continuity of mental capacities, but such continuity is not realized via the physically continuous organ of the brain?²³ Why should it track any underlying capacity for consciousness at all? Why shouldn't it instead simply track continuity of conscious states into the future, whether this be realized through the processes of replication or through an underlying physical realizer along the lines of a brain? McMahan provides no theoretical explanation for the exclusion of replicas from the scope of one's concern regarding future experiences.

My own account fills this gap by providing the following underlying explanation for this exclusion: McMahan's combination of physical and functional continuity provides the extent of one's rational concern regarding future experiences precisely because this combination ensures that you will *become* each of two people in the fission case. You will become each of them even though you will be identical to neither of them, since this is the 'becoming' of substantial rather than qualitative change. Moreover, the physical and functional continuity also ensures that your *mind* will become (i.e., substantially change into) each of the two minds of your post-fission successor, in the manner that I described at the close of Sect. 4 above. In cases of replication involving the absence of physical continuity, by contrast, you will not become anyone else. You will merely be replaced. Similarly, your mind will not become anything else. It will simply be replaced. More generally, a substance-connected concern for who I will be or become provides the underlying explanation for why physical continuity is necessary for rational concern for future experiences and mere continuity of psychological functional capacities insufficient.

Our concern regards the fate of substances, because we regard ourselves as beings rather than processes or bundles of sensation. More specifically, we regard ourselves as "something in which the flow of consciousness and the beliefs, desires, intentions, and character traits that I have all take place—something beneath the contents of consciousness" (Nagel 1986, p. 45). It is for this reason that the positing of a substance-connected concern for a person who is identical to you or who you will become—when your mind also maintains its identity as a thing or becomes other minds—provides a plausible and more promising explanation of intuitions about cases regarding what we have reason to anticipate and care about. This proposal ought to be placed on the agenda for further discussion, development, and critical scrutiny.

²³ McMahan (2002, pp. 68–69) maintains that "there is functional... continuity of the brain [i.e., continuity of its capacities for consciousness and mental activity] when a person is replicated (as in Teletransportation), even though there is no physical continuity at all—that is, even though the relevant functions and patterns of organization are not preserved in the same brain".

Acknowledgements I have delivered versions of this paper at Birkbeck College, the Hebrew University, the LSE, Roehampton University, UCL, UCLA, and the Universities of Copenhagen, Edinburgh, Glasgow, Nottingham, Oxford, St Andrews, Stirling, Stockholm, and Warwick. I thank the members of these audiences for their comments. I also thank Ralf Bader, G. A. Cohen, Simon Evnine, Sean Foran, Peter Graham, Katherine Hawley, Paul Hovda, Matthew Liao, Rory Madden, Jeff McMahan, Derek Parfit, Paul Snowdon, Bastian Steuwer, Ralph Wedgwood, and two anonymous referees for their comments.

Open Access This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made.

References

- Adams, R. (1989). Should ethics be more impersonal? *The Philosophical Review*, 98(4), 439–484.
- Aristotle ([c. 350 BC] 1982). *De generatione et corruptione* (trans: Williams, C. J. F.). Oxford: Oxford University Press.
- Evnine, S. (2016). *Making objects and events*. New York: Oxford University Press.
- Johnston, M. (1997). Human concerns without superlative selves. In J. Dancy (Ed.), *Reading Parfit* (pp. 149–179). Oxford: Blackwell.
- Lewis, D. (1976). Survival and identity. In A. O. Rorty (Ed.), *The identities of persons* (pp. 17–40). Berkeley: University of California Press.
- Lowe, E. J. (2002). *A survey of metaphysics*. Oxford: Oxford University Press.
- Lowe, E. J. (2006). How real is substantial change? *The Monist*, 89(3), 275–293.
- McMahan, J. (2002). *The ethics of killing*. New York: Oxford University Press.
- Nagel, T. (1986). *The view from nowhere*. New York: Oxford University Press.
- Olson, E. (1997). *The human animal*. New York: Oxford University Press.
- Parfit, D. (1971). Personal identity. *The Philosophical Review*, 80(1), 3–27.
- Parfit, D. (1986). *Reasons and persons*. Oxford: Oxford University Press.
- Parfit, D. (1995). The unimportance of identity. In Henry Harris (Ed.), *Identity* (pp. 13–45). Oxford: Oxford University Press.
- Shoemaker, S. (1963). *Self-knowledge and self-identity*. Ithaca: Cornell University Press.
- Shoemaker, S. (1984). Personal identity: A materialist's account. In S. Shoemaker & R. Swinburne (Eds.), *Personal identity* (pp. 67–132). Oxford: Blackwell.
- Sider, T. (1996). All the world's a stage. *Australasian Journal of Philosophy*, 74(3), 433–453.
- Snowdon, P. (1991). Personal identity and brain transplants. In D. Cockburn (Ed.), *Human beings* (pp. 109–126). Cambridge: Cambridge University Press.
- Thomson, J. (1997). People and their bodies. In J. Dancy (Ed.), *Reading Parfit* (pp. 202–229). Oxford: Blackwell.
- Unger, P. (1990). *Identity, consciousness and value*. New York: Oxford University Press.
- Unger, P. (1992). Précis of *Identity, consciousness and value*. *Philosophy and Phenomenological Research*, 52(1), 133–137.
- Wiggins, D. (1967). *Identity and spatio-temporal continuity*. Oxford: Blackwell.
- Wiggins, D. (2001). *Sameness and substance renewed*. Cambridge: Cambridge University Press.
- Williams, B. (1970). The self and the future. *The Philosophical Review*, 79(2), 161–180.
- Wolf, S. (1986). Self-interest and interest in selves. *Ethics*, 96(4), 704–720.