

The Multiplicity Objection against Uploading Optimism

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Abstract

Could we transfer you from your biological substrate to an electronic hardware by simulating your brain on a computer? The answer to this question divides optimists and pessimists about mind uploading. Optimists believe that you can genuinely survive the transition; pessimists think that surviving mind uploading is impossible. An influential argument against uploading optimism is the multiplicity objection. In a nutshell, the objection is as follows: If uploading optimism were true, it should be possible to create not only one, but multiple digital versions of you. However, you cannot literally become many. Hence, you cannot survive even a single instance of uploading, and optimism about uploading is misguided. In this paper, I will first spell out the multiplicity objection in detail and then provide a two-pronged defence against the objection. First, uploading pessimists cannot establish that uploading optimism has the contentious implication. Second, it is in fact plausible to think that we could become multiple distinct persons. Optimists' hope for a digital afterlife is therefore not thwarted by the prospect of multiplicity.

1 Introduction

Mind uploading aims at transitioning us from our biological substrate to an electronic hardware. A particularly intriguing form of mind uploading is ‘scan-and-copy’ uploading, where a person’s brain is scanned and then simulated on a computer. The hope is that the simulated brain will give rise to a real mind, which, so the hope continues, will be a genuine continuation of the original mind. Mind uploading might hold the promise to extend our lives indefinitely.¹

Uploading optimism is the view that it is possible to survive mind uploading. The electronic person (if there is one) will really be you, rather than merely your digital copy.

¹ In this paper, I will focus on *destructive* ‘scan-and-copy’ uploading, where a person’s brain is scanned and simulated, and the biological hardware gets destroyed in the process. When using the term ‘mind uploading’ without qualification, I am referring to this form of uploading. There are other forms, such as gradual replacement uploading, in which someone’s biological neurons are replaced over time by functionally equivalent silicon chips (Chalmers, 2010; Wiley, 2014). Scan-and-copy uploading is arguably the most challenging case for uploading optimists to defend, so I am not trying to make things easy for myself. Non-destructive uploading deserves its own analysis, which is beyond the scope of this paper. It may be plausible to treat non-destructive uploading as a case of asymmetric fission where the original person survives only in her biological body, but not in electronic form.

Uploading pessimism, on the other hand, is the view that we cannot survive mind uploading.² Doubts about mind uploading’s technological feasibility aside, the central philosophical case against uploading optimism rests on the idea that optimism presupposes a flawed conception of human persons—we are simply not the type of thing that could be uploaded.

In this paper, I discuss the perhaps most influential argument against uploading optimism: the multiplicity objection. The central idea behind this objection is the following. If you could survive uploading, as optimists believe, then it should be possible to upload you not just once, but many times, e.g. by running several simulations of your brain on different computers. It should then be possible to create multiple versions of you. But there can only ever be one of each of us. So uploading optimism is wrong, and you cannot survive even a single instance of uploading.

My aim is to refute the multiplicity objection and thereby to advance the debate on mind uploading (rather than to contribute directly to the more general debate on personal identity). I begin in §2 by giving a preliminary case for uploading optimism. §3 provides a detailed reconstruction of the multiplicity objection. The remainder of the paper offers a two-pronged response to the objection.

First, in §4 and §5, I argue that, contrary to what the objection claims, uploading optimism does not entail that we could become multiple persons. Indeed, pessimists are barred to make the case that optimism has this implication. Second, in §6, I examine whether multiplicity is truly impossible, contending that the idea that we might become many different persons is both intuitively plausible and theoretically well-founded. In §7, I further defend multiplicity against a novel conceivability-based objection.

If my arguments succeed, they demonstrate that the debate on mind uploading should move beyond the multiplicity objection; uploading pessimists must find better arguments, since the objection ultimately fails to gain traction. Moreover, I hope to show that the idea of multiplicity—the possibility of having multiple electronic successors—should not be dismissed outright but deserves to be taken seriously as a viable position for uploading optimists.

2 Uploading optimism and personal identity

Before discussing the multiplicity objection, I want to quickly look at why uploading optimism is *prima facie* attractive. The conflict between uploading optimism and pessimism touches on central issues in the debate on personal identity. This debate is centred on two core questions. The first is the question of *personal ontology*, which asks: what kind of thing are we? Potential answers to this question include: we are organisms; we are things constituted by organisms; we are immaterial souls; we are composites of body and soul; we are temporal parts of human organisms, etc. The second is the question of *personal persistence*, which asks: what grounds our survival? Potential answers to the second question include:

² There are also intermediate views between optimism and pessimism, which hold that some forms of uploading are survivable, while others are not (Weber, 2025).

our persistence is grounded in the continuity of our organism; our persistence is grounded in the continuity of our soul; our persistence is grounded in the continuity of our minds, etc.

There is a relatively straightforward case for uploading optimism based on a certain answer to the question of *personal persistence*. Optimism is motivated by the idea that our survival is grounded in the continuity of our minds. Combined with a functionalist approach to the mind, according to which mental states can be realized in different substrates, this account of personal persistence implies uploading optimism:

A simple case for uploading optimism

- (1) Our survival is grounded in mental continuity.
- (2) Mind uploading preserves mental continuity.

∴ We can survive mind uploading.

The first premise expresses the mental account of our diachronic identity, according to which we survive as long as the continuity of our mind is preserved. The second premise is supported by a functionalist or computationalist approach to the mind, together with the observation that there is a causal dependence of the simulated brain on the prior states of the biological brain. According to functionalism/computationalism, the simulation of S's brain on a computer, or rather its implementation, gives rise to the same mental states as S's biological brain, assuming that the simulation replicates the brain's causal topology (Chalmers, 1996, 2012). Like any philosophical claim, the two assumptions on which this argument is based are contested. But they are mainstream views on personal identity and the mind.³

Although this case for uploading optimism is only a rough sketch and lacks important details, it highlights two key points. First, there is a plausible, *prima facie* case for uploading optimism, based on two reasonable assumptions. Second, the case is not, at least not directly, dependent on a specific view of personal ontology. True, the question of personal persistence is itself closely linked to the question of personal ontology. But the connection is not completely straightforward. For instance, many who endorse a mental view of personal persistence accept a materialist ontology of person (e.g. Lewis, 1971; Shoemaker, 1984). And even Animalists about personal ontology can in principle accept a mental account of our persistence (Bailey, 2015). The mental account is therefore not obviously wedded to a specific view of personal ontology, let alone a mentalist one according to which we are minds or Cartesian egos. Of course, uploading optimists need to tell some plausible story about what kind of object we are. And they also need to tell a believable story about what type of thing uploads are (Olson, 2019; Brenner, 2024). Finally, both stories need to complement each other: we have to be the type of thing that could become the type of thing which uploads are. Arguably, we are not fundamental entities, such as elementary particles. Instead, it is plausible that we are things which are *constituted* (in a minimal sense (Robinson, 2016))

³ According to (Bourget and Chalmers, 2023), the mental or 'psychological' account of persistence is the dominant view among professional philosophers on personal identity; functionalism is the most popular account of consciousness. The mental view of personal persistence is rejected e.g. by (Thomson, 1997; Olson, 1997; Snowdon, 2014); for alternatives to functionalism see e.g. (Block, 1978; Searle, 1992).

by our biological organisms. Uploads, on the other hand, can be considered entities which are constituted by pieces of computer hardware (Chalmers, 2017). Uploading optimists can then say that we are things which are constituted first by biological organisms and, after the uploading, are constituted by pieces of computer hardware. Why should we believe in the (possible) existence of such hybrid entities? On the mental view of personal persistence, the relation which unifies these hybrid objects across time is the unity of our minds.⁴

3 The multiplicity objection

The multiplicity objection is probably the most common argument against uploading optimism. It has been articulated in different forms by various uploading pessimists, such as Olson (2017, 2022); Schneider (2019); Piccinini (2021); Goldwater (2021), and (Zhan, 2024). At its core, the objection is that uploading optimism implies the false claim that one person could literally become many distinct persons. As alluded to above, there are two potential lines of response to this objection. First, optimists may deny that their view has this implication. Second, they can accept the implication, but argue that the implied proposition is not in fact false. In this paper, I shall make the case that both lines of response are viable.

We can formulate the idea that none of us could be or become many, but that each of us is instead *unique*, as follows:

(Uniqueness) Necessarily, each person p is such that they could not be several distinct persons at other times or worlds.

Even though uniqueness, as formulated here, concerns persons, it is not our special privilege. It is an instance of the more general claim that no concrete particular could be or become many distinct things. Uploading optimists, so the charge goes, are committed to the denial of (Uniqueness) and to the endorsement of the following claim:

(Multiplicity) At least some person p is such that s/he could be several distinct persons at other times or worlds.

(Multiplicity) states that some of us could be or become many. Why think that uploading optimism has this implication? The thought is that if we could transfer you from your body to a computer by simulating your brain there, as optimists assume, nothing prevents us from transferring you to a number of additional computers by also running simulations on them. If you could be successfully uploaded once, you could be successfully uploaded many times, it seems. But optimists seem bound to accept that you would then be each of the multiple uploads; optimisms appears to entail multiplicity.

We can formulate the objection more explicitly as the following argument:

⁴ It is of course possible that uploading fails to preserve the required mental unity. I will put this concern aside here, since it is orthogonal to the multiplicity objection. Assessing this issue requires a careful analysis of the mental unity relation. For reasons to be doubtful that scan-and-copy uploading would preserve mental unity see e.g. (Agar, 2003; Shoemaker, 2004; Dainton, 2012).

The Multiplicity Objection Against Uploading Optimism

- (1) If it is possible to survive single uploading, then it is possible to survive multi uploading.
 - (2) In multi uploading one either survives as each of the multiple uploads or one does not survive at all.
 - (3) It is not possible to survive as each of the multiple uploads. [Uniqueness]
 - (4) Therefore, it is not possible to survive multi uploading. [from (2) and (3)]
 - (5) If it is not possible to survive multi uploading, then it is not possible to survive single uploading. [contraposition of (1)]
 - (6) Therefore, it is not possible to survive single uploading. [from (4) and (5)]
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∴ It is not possible to survive single or multi uploading [Uploading pessimism].

The substantial premises in this objection are the first three. We shall assess these premises in turn. First, is it plausible that if a single instance of uploading is survivable, then so are multiple instances? Second, is it true that the only way to survive multi uploading is to become each of the many uploads? Third, is it really impossible for one person to be several distinct persons in the future? On the face of it, each of the three premises seems more plausible than its negation—the multiplicity objection therefore provides a strong *prima facie* argument against uploading optimism. But on further reflection it will become apparent that the objection fails.

4 Multi uploading and non-branching clauses

According to premise (1), those who accept that single uploading is survivable have to also accept that multi uploading is survivable. Note first that nothing in practice stands in the way of multi uploading, since the uploading process is repeatable. We can simply copy the data from the brain scan to many different computers and run separate simulations on each of them. In each case, the relation between the pre-upload person and the post-upload person appears to be identical to that exhibited in a single instance of uploading.

It is useful to distinguish two readings of premise (1). The first, weaker reading says that if you can survive single uploading, then you can also survive multi uploading *as at least one of the multiple uploads*. The second, stronger reading says that if you can survive single uploading, then in multi uploading you survive *as each of the multiple uploads*.

We can here assume the weaker reading of the first premise. The stronger reading is introduced by premise (2). Why think that premise (1) is true on its weaker reading? According to uploading optimists, scan-and-copy uploading is person-preserving, since it maintains mental continuity which optimists regard as the ground of our diachronic identity. But if a single instance of uploading secures that there is a future person standing in the required, persistence-maintaining relation to the original person, it would be strange to think that adding more such instances could undo this. If anything, this should make it more

certain that the relation obtains. Modifying a famous line from Parfit, we may ask: ‘How could a [multi] success be a failure?’ (Parfit, 1971, p. 5).

The motivation behind premise (1) can be articulated in another way. Whether a person counts as my future self should depend only on the relation between me and that future person (Wiggins, 1980; Thomson, 1997; Noonan, 2019). It should not depend on factors extrinsic to that relation. Rejecting premise (1) would seem to entail that identity can depend on such extrinsic factors, since whether upload U_i is my future self would then be determined not only by the relation between me and U_i , but also by the presence or absence of other upload competitors. If there are no competitors, as in single uploading, then I am identical with upload U_i . But if there are such competitors, as in multi uploading, then I fail to survive as any of them. Since this idea is unattractive, we should accept that if single uploading is survivable, then so is multi uploading.

There is a close parallel between the multiplicity objection and the ‘reduplication problem’, whose discussion had a formative influence on the recent history of the personal identity debate. In particular, two papers by Bernard Williams have significantly shaped the current discussion on this issue (Williams, 1957, 1960). In response to Williams, most proponents of the mental view of personal persistence acknowledge that an appropriate account of our diachronic identity needs to include a *non-branching clause*. On such a view, person P at t_1 is identical with person P* at t_2 iff P and P* are continuous in certain way *and if that continuity does not take a branching form* (Shoemaker, 1970; Parfit, 2008; Gustafsson, 2019).⁵ Proponents of non-branching accounts of personal persistence have a principled reason to reject premise (1). On their view, the fact that two person stages at different times stand in the right continuity relation is in itself not sufficient for them to count as stages of the same person. It has to also be the case that there are no competitors. According to non-branching views, single uploading therefore secures our survival, while multi uploading does not, and premise (1) should be rejected. As noted above, such views then face the objection that their account renders our diachronic identity implausibly dependent on extrinsic factors. Influential proponents of non-branching accounts, such as Parfit, do not consider this is a serious problem. Parfit writes: “Truths about identity can depend on extrinsic facts.” (Parfit, 2008, p. 189).⁶

⁵The main alternative to including a non-branching clause is *the multiple occupancy view* of Lewis (1976), according to which there are already two, partially overlapping persons before the reduplication. I will set Lewis’s proposal aside here and just note that the multiplicity objection is not a serious threat to uploading optimism according to this view. Multi uploading would merely reveal that the pre-upload person is a shared temporal part of a potentially large number of persons.

⁶Parfit tries to downplay the implausibility of this stance; he writes: “What happens elsewhere does not, mysteriously, affect what happens here. [...] What events elsewhere affect is only the *label* that we can apply to what happens here. That is no more puzzling than the fact that, if my father has another child, though in a way that has no effects on me, that could make it true that I am not my father’s only child. Whether I am my father’s only child is partly an extrinsic fact: it does not depend only on my father’s relation to me.” (Parfit, 2008, p. 191). Applied to the case at hand, Parfit’s suggestion is that the existence of competitors merely affects whether a future person deserves the label ‘my future self’. On the face of it, this response does not go far enough, since the difference between the cases does not seem purely linguistic. Rather, it marks the

The extrinsicness problem seems to deal a blow to optimists who respond to the objection by adopting a non-branching view. But this impression is mistaken. The issue does not only affect mental accounts of personal persistence; its scope is much more general (Perry, 1976; Noonan, 2019; Gustafsson, 2019).⁷ Any *complex* account of personal identity, i.e. views which take personal persistence to be grounded in certain (physical or mental) impersonal continuity relations, faces the problem.⁸ The general difficulty is that the continuity relations which underpin the *temporal unity relation* for persons (Perry, 1972), or what Lewis (1976) calls the *I-relation*, can have a one-many form, i.e. they allow for branching. To avoid multiplicity, the personal unity relation in contrast needs to be one-one. Analysing personal unity in terms of impersonal continuity relations, as complex accounts do, therefore requires a non-branching clause. (We will see in §6 that it is possible to lift this assumption.)

Could uploading pessimists in response reject the complex account of personal identity, with its non-branching clause, and opt for a *simple view* of personal identity instead? We will see in the next section that this won't help their cause either. The reason is that simple views of personal identity clash with premise (2) of the multiplicity objection. Let us assess this premise next.

5 Multi uploading and all-or-nothing survival

Premise (2) states that when a person is uploaded multiple times, she either survives as each of the many uploads or she does not survive at all. The rationale behind this premise is that each upload appears to have an equal claim to be the successor of the original person. To privilege one of the uploads over the others as her future self would be arbitrary. She is either all of them or none.

Is it really the case that all uploads have an equal claim for being the person's future self? There can certainly be forms of multi uploading where some uploads have a stronger claim than others. For instance, there may be temporal asymmetries where one upload is being created long before the others. Similarly, there can be differences in the nature of the causal chain leading from the pre-upload person to the uploads. We can e.g. imagine cases where only one upload is caused in a reliable way from the scan data, while the others are caused by certain freak coincidences. Or there could be differences in the fidelity of data transmission to the different computers. And so on. The existence of such asymmetrical scenarios does not change the overall picture. To get the multiplicity objection off the ground, it is sufficient that there are *some instances* of multi uploading where each upload has an equal claim to

distinction between survival and non-survival—what could be more substantial than this? But Parfit (1984) has also argued that on a reductionist view of personal identity the preservation of our diachronic identity as such should not matter to us. What should matter is rather whether the relevant continuity relations are carried forward. And they are carried forward in multi uploading, in fact, multiple times.

⁷ This point has been acknowledged by some uploading pessimists such as (Olson, 2017).

⁸ There can in principle be complex accounts that rule out branching, such as the view that diachronic identity requires the continuity of *more than half* of one's biological matter. This view is, however, implausible for independent reasons, since it is clearly possible to survive the loss of more than half of one's organic matter.

be the original person's successor. And it is plausible that there can be symmetrical cases of multi uploading where this is true. We can then simply focus our attention on symmetrical cases of multi uploading (and interpret the original objection correspondingly).

Some may think that there will always be a tie-breaker which selects one upload over the others. Consider the possibility that we are, or have, immaterial souls. Suppose further that our soul attaches, randomly or through divine intervention, to one of the uploads. There would then be a good reason to believe that we survive as a specific one of the otherwise symmetrical uploads.⁹ But if this was the only way to maintain uploading optimism, the position of optimists would seem rather desperate. Furthermore, if optimists had to stake their hopes on the existence of immaterial souls or of a supernatural deity, their efforts to secure a *digital* afterlife would seem quite unmotivated, since they could only succeed in a world that is likely to already contain the genuine article.¹⁰

Importantly, the above shows that premise (2) is plausible only insofar as we have reason to believe that our survival supervenes on certain impersonal continuity relations, as complex accounts of personal persistence maintain. It is this assumption which makes it plausible that each of the multiple uploads has an equal claim to be the original person's successors. When we lift this assumption, and endorse a simple view of personal identity instead, premise (2) no longer appears plausible. If our diachronic identity is determined by the continuity of an immaterial soul, or is simply brute metaphysical bedrock, nothing rules out the possibility that I survive multi uploading as upload U_{127} , since this is the upload which becomes associated with my soul or which is primitively identical to me.

In combination with the result from the last section, this shows that the multiplicity objection faces a dilemma. An account of personal identity has to be either complex or simple. On the assumption that multiplicity is false, complex accounts need to be supplemented with a *non-branching clause*. On this horn of the dilemma, we should reject premise (1), which states that if single uploading is survivable, so is multi uploading. Non-branching accounts entail instead that single uploading may be survivable, but multi uploading is not. If, on the other hand, we endorse a *simple account* of personal identity, premise (2) should be rejected, which states that one can survive multi uploading only as each of the multiple uploads. A simple account predicts in contrast that one can survive multi uploading as a single designated upload. Either way, uploading pessimists cannot make the case that uploading optimism entails (Multiplicity). This constitutes the first line of defence against the multiplicity objection: uploading optimism by itself does not imply the claim that we could become multiple distinct uploads. This brings us to the second line of defence. Is it really so obvious that this claim is wrong?

⁹ A response to the multiplicity objection along these lines has been suggested in (Brenner, 2024, §9.1).

¹⁰ Admittedly, there are other motivations for mind uploading, beyond life extension, such as integrating with superintelligent AI (Chalmers, 2010).

6 Multiplicity

Could one person survive as several non-identical persons? The question is not whether you could live on, in a certain sense, in your children. Rather, the question is whether it could literally be true that while you are just one person now, you could be a number of distinct persons at other times or worlds. According to philosophical orthodoxy, one thing cannot become many. The central worry is that multiplicity violates the logic of identity. Olson, commenting on the idea of double uploading, writes:

One thing can't be identical to two things that are distinct from each other. If you and the first electronic person were one, and you and the second person were one, then the first electronic person and the second electronic person would also have to be one. [...] Supposing that you move to two computers by 'double upload' leads to a contradiction. (Olson, 2022, p. 388)

Consider a single object a . Could a become two distinct things b and c ? Since b and c are distinct, it is the case that $b \neq c$. But if a were to literally become these two things, a would have to be identical to both, so $b = a$ and $a = c$. The transitivity of identity then entails that b and c are also identical, $b = c$, contradicting the initial assumption that $b \neq c$. This is why Olson says that the idea that we can survive double or multi uploading 'leads to a contradiction'. Others, e.g. Goldwater (2021) and Zhan (2024), have argued, not that multiplicity implies a contradiction, but that it presupposes that we are abstract entities, since only abstract entities can have multiple instances (see also (Williams, 1973)). I will respond to this version of the objection in §6.2. Before doing so, I will make the case, against orthodoxy and Olson's argument, that it may really be possible for us to survive as several distinct persons. The case for multiplicity has two parts. First, there are pre-theoretically plausible examples of multiplicity. Second, it can be shown that multiplicity, properly understood, does not lead to violations of the transitivity of identity.

6.1 The case for multiplicity

Consider first the common sense case for multiplicity. There are mundane situations where a single object seems to be identical to several distinct objects at other times/worlds. A nice example is presented in (Schwarz, 2014):

The train from Berlin to Düsseldorf and Cologne passes through a place called Hamm, where it gets divided: the front half continues to Düsseldorf, the rear half to Cologne. Before the division, the two halves compose a single train. (The announcement on the train says that *this train will be divided*, not that *these trains will be separated*.) After the division, two trains seem to be leaving Hamm—one towards Düsseldorf, the other towards Cologne. [...] So there is one train before Hamm, and two trains after Hamm. Yet if you asked whether the train from Berlin ends at Hamm, you would get a negative answer. (Schwarz, 2014, p. 1057)

Our pre-theoretic judgments about the case are as follows: The original train does not cease to exist when it gets divided. Rather, it continues to Düsseldorf, and it also continues to Cologne. But the train to Düsseldorf is not the same as the train to Cologne. One train continues on as two distinct trains.

There are other examples which also appear to be instances of multiplicity. Moyer (2008, p. 313) discusses the case of a wave which branches off into two different waves, without ceasing to exist. Schwarz (2014, p. 1058) mentions a version of the ship of Theseus. Some of the following cases may also qualify: when we divide worms, bushes, or pencils in half (in the right way), each of the two halves may count as a genuine successor of the original object. One worm/bush/pencil has become two worms/bushes/pencils.

And there are modal analogues of these examples (Gibbard, 1975; Lewis, 1986; Stalnaker, 1987; Schwarz, 2014). Consider two identical twin wombats, call them Wombi and Wombo. Had the zygote from which Wombi and Wombo emerged not split, there would have been only one wombat, call him Womba. Since the case is completely symmetrical, it seems plausible that both Wombi and Wombo are cross-world identical to Womba. In other words, had things gone differently, the two wombats could have been just one wombat. Or, viewed from Womba's perspective, he could have been each of a pair of identical twins.

The above suggests that, pre-theoretically, there are plausible instances of multiplicity, where a single object is identical to several distinct objects at other times or worlds. A critic may acknowledge that these cases have some intuitive force. But, she may insist, there are no parallel cases for human persons. Furthermore, the intuitive force of the examples is surely outweighed by the fact that they violate the transitivity of identity—logic trumps common sense. I will take these points in order.

First, it is easy to find cases involving persons in the modal domain that parallel the above wombat example. For instance, had the zygote from which you developed split into two, there would have been a pair of identical twins with your DNA. Since both twins stand in the exact same relation to you, it would be arbitrary to choose one over the other as your representative in that possible world. Hence, had things gone slightly differently, you could have been each of a pair of identical twins. Second, hypothetical cases of symmetrical personal fission, e.g. through hemispherectomy, provide plausible examples of multiplicity for persons in the temporal sphere. Now, most of us have come to accept that a person cannot literally become two, since, so we are being taught, that would violate the transitivity of identity. We will discuss this worry next. For the time being, we are merely concerned with the question of whether such cases provide intuitive support for multiplicity. And as Moyer (2008) reminds us, the common sense description of personal fission has it that there is single person before the fission, two people after the fission, and the original person also seems to survive the fission, since each offshoot has everything required for ordinary persistence: 'The fission of a person involves what common sense describes as a single person surviving as two distinct people.' (Moyer, 2008, p. 299). Common sense acknowledges multiplicity for persons as well.¹¹

¹¹ In a sense, branching may be easier for objects whose persistence is grounded in mental continuity, since

Does the intuitive case for multiplicity collapse when pitted against the logic of identity? No, when properly analysed, it can be shown that multiplicity does not violate the logic of identity after all. That multiplicity leads to a contradiction is somewhat of a philosophical prejudice. Stalnaker (1987) has shown that multiplicity cases do not clash with the transitivity of identity after all (see also Perry, 1972; Schwarz, 2013, 2014). Recall that the problem is that all of the following three statements seem true in cases of multiplicity: (1) $b = a$ and (2) $a = c$ and (3) $b \neq c$. According to Stalnaker, this impression is mistaken; it is due to the fact that we are assessing the statements in an atemporal or amodal way. But they need to be assessed instead *from the perspective of a given world or time*. Commenting on the modal domain, Stalnaker (1987, pp. 123–124) writes: “The idea that there is a perspective outside all possible worlds from which we can talk about them is a possibilist myth”. When assessed from within a given world or at a certain time, it becomes apparent that there is no time or world where all three statements are true together. At each time or world, the transitivity of identity is therefore upheld.

Consider first the modal case, like the above wombats, where a single object a at w_1 is cross-world identical to two distinct objects b and c at w_2 . First, assess statements (1), (2), and (3) from the perspective of w_1 , which contains just a single individual. Are statements (1) $b = a$ and (2) $a = c$ true at this world? Yes, they are true, since at w_1 both b and c are identical to the single object a . Is statement (3) $b \neq c$ true at this world? No, (3) is false here, since b and c are distinct only at w_2 . At w_1 , ‘they’ are both identical to the one thing a . So there is no violation of transitivity at w_1 , since (3) is false here. Next, assess the statements from the perspective of w_2 . At w_2 , (3) $b \neq c$ is clearly true, since at this world there are indeed two distinct objects, b and c . But are statements (1) and (2) true here? From the perspective of w_2 , (1) $b = a$ and (2) $a = c$ fail to be true. The reason is that the term “ a ” does not have a unique referent in w_2 . It purports to refer to the object which, in w_1 , is identical to a . But there are two candidates which fit the bill at w_2 , i.e. b and c . So (1) and (2) fail to express true propositions in w_2 . Once more, there is no violation of the transitivity of identity at w_2 . Stalnaker puts this point as follows:

What these identity statements [i.e. (1) and (2)] do is identify each of b and c with the individual that in w_1 is identical with a . But the description ‘the individual that in w_1 is identical with a ’ is, in w_2 , an improper description. So the identity statements are, in w_2 , either false, truth-valueless, or ambiguous. The fallacy of the w_2 version of the argument, $b = a$, $a = c$, therefore $b = c$, is analogous to the fallacy in the following argument: Russell is the author of *Principia Mathematica*, the author of *Principia Mathematica* is Whitehead, therefore Russell is Whitehead. (Stalnaker, 1987, p. 125)

We can apply the same reasoning to temporal cases, such as the above train example.¹²

mental continuity can branch *and* be fully retained at the same time, i.e. all of the original mental states can be preserved in each offshoot. In the case of physical continuity, in contrast, the successors can at best retain half of the matter of the original object (Moyer, 2008, p. 313).

¹² Stalnaker (1987) himself cautions against transferring the argument directly from the modal to the temporal

Here, we need to assess all statements at a given time. Assessed at the time before the train’s division, the statement ‘the train to Düsseldorf is identical to the train that left from Berlin’ is true. And the same hold for the statement ‘the train that left from Berlin is identical to the train to Cologne’. (These statements correspond to (1) and (2) from above.) However, at this time, the following statement is also true ‘the train to Düsseldorf is identical to the train to Cologne’, since there is only a single train on the tracks then (i.e. the equivalent of (3) is false). Consider next a time after the train’s division. At this time, there are two distinct trains on the tracks, one to Cologne and a distinct one to Düsseldorf. Hence the analogue of (3) is true at this time: ‘the train to Düsseldorf is not identical to the train to Cologne’. What of the two statements: ‘the train to Cologne is identical to the train that left from Berlin’ and ‘the train to Düsseldorf is identical to the train that left from Berlin’? After the division, the description ‘the train that left from Berlin’ is improper, lacking a unique referent, since there are two equally valid candidates for its reference. Consequently, the two statements fail to express true propositions (i.e. the equivalents of (1) and (2) fail to be true). As in the modal case, there is no single time at which all three statements are true together, and the transitivity of identity is preserved.

The above shows that the logic of identity does not stand in the way of multiplicity. Uploading optimists are therefore free to take seriously the idea that one person can survive as multiple uploads.¹³ But is this plausible? On the optimist’s mental approach to personal

case, since it is more natural to consider objects *sub specie aeternitatis*.

¹³ In addition to the objection from the transitivity of identity, multiplicity faces other challenges (thanks to an anonymous referee for this journal for encouraging me to explicitly discuss the following worry). Most significantly, multiplicity is intimately associated with the claim that identity is *contingent* (Stalnaker, 1987; Gray, 2001). And contingent identity seems to run counter to a simple argument from Leibniz’s law (together with certain standard assumptions of quantified modal logic). In a nutshell, the argument is as follows: if x is identical to y , then x and y share all their properties; x has the property of being necessarily identical to x ; so y also has the property of being necessarily identical to x ; hence, if x is in fact identical to y , then it is necessary that x is identical to y . (This argument is often associated with Ruth Barcan Marcus, as well as Kripke (1971) and Wiggins (1980)). The argument has been challenged in different ways. For instance, Noonan (1991) points out that the substitution principle on which the argument relies fails for so-called ‘Abelardian’ predicates, which according to Noonan include modal predicates, such as *being necessarily identical with x* . Others have suggested that we should distinguish the property of *being necessarily identical to x* from the property of *being necessarily self-identical*, e.g. (Lowe, 1982). More interestingly, Stalnaker (1987, p. 131–132) has demonstrated that proponents of multiplicity can endorse the argument and its conclusion. The statement expressing the necessity of identity: $\forall x\forall y(x = y \supset \Box x = y)$ can be shown to be valid in the corresponding counterpart-theoretic framework (Stalnaker, 1987, p. 131–132), see also (Gray, 2001, Ch. 2). Endorsing multiplicity may therefore not require abandoning the principles on which the argument rests. Having said this, we have also seen above that in the proposed framework incompatible identity statements can be true from the perspective of different possible worlds or times; as Stalnaker writes: “If the counterpart relation is nontransitive, then there will be identities true in one possible world that conflict with those true in another [...]” (Stalnaker, 1987, p. 125). So there is a sense in which identity relations do not hold of necessity. Furthermore, Stalnaker has pointed out that the framework does not validate the *inner necessitation* of the necessity of identity (Stalnaker, 1987, p. 132).

Given the complexity of the dialectical situation, it is difficult to assess how costly these consequences of the proposal are. Insofar as there are pre-theoretically compelling cases of multiplicity, the consequences do not appear particularly damaging—it is only to be expected that a framework which accommodates multiplicity

identity, we go where our mind goes. Unless we add to the mental account a non-branching clause, the account predicts that we become many when our minds branch off into many separate minds. On this picture, symmetrical multi uploading is precisely the kind of case where we would expect one person to survive as many successors, each being a genuine continuation of the biological person.

Taking multiplicity seriously, we should be able to say of the biological person before uploading that she will in the future be several distinct electronic persons. Conversely, it should be true of each upload after uploading that they once were a specific biological person. Optimists who endorse multiplicity need an appropriate semantical framework that matches these descriptions. Conveniently, such a framework has already been provided, in somewhat different versions, by Perry (1972), Moyer (2008), and Schwarz (2014). In a nutshell, the resulting picture is as follows. A person P at t is identical with P^* at other times t^* iff P and P^* stand in the personal unity relation. As uploading optimists, we can analyse the personal unity relation in terms of mental continuity. Since we explicitly allow for branching, there is no need to include a non-branching clause in the analysis. In multi uploading, the biological pre-upload person will be mentally continuous and thus diachronically identical with many distinct electronic successors. Hence, (Multiplicity) is true. Viewed from a time before uploading, we can think of the biological person's career, or her *lifetime* (Perry, 1972), as a tree-like entity, with a biological trunk and multiple electronic branches, one for each upload that is mentally continuous with her. Viewed from a time after the uploading, an upload's career is instead a linear branch comprised of the pre-upload's biological trunk and the upload's residual electronic branch. The reason is that each upload is mentally continuous only with person stages on her own future branch and the previous stages of the biological person, but not with any person stages on other branches.¹⁴ The basic idea behind the semantics is that temporal operators shift the reference of singular terms and variables, such that they refer either to the biological person with the tree-like career at a time before the uploading, or to the single upload branches at a time after the uploading. The statement *at t^* in the future, P is F* uttered at t is true iff there is at least one person P^* at t^* which is unity related to P such that P^* is F at t^* . We can therefore correctly assert of the biological person P before uploading 'after the uploading, P will be upload U_1 on computer₁', and also 'after the uploading, P will be upload U_2 on computer₂', etc. The first statement is rendered true by one upload branch, the second statement is rendered true by a different branch, and so on.¹⁵ And it will also be true to say of a given upload U after the uploading: 'Before the

will violate some of the principles associated with the idea that identity is necessary. On the other hand, those who think that there is independent support for thinking that identity is necessary will consider the clash a significant downside of the proposal. For a recent discussion and independent arguments against the necessity of identity see (Roberts, 2021).

¹⁴ As Gustafsson (2021) has pointed out, this picture presupposes a temporally ordered notion of mental continuity.

¹⁵It will not be true to say of P : 'after the uploading, P will be both on computer 1 and computer 2' since there is no upload branch that is on both computers. On this analysis, we may want to refine our response to the initial transitivity objection. If a statement 'at t , P is F ' is true iff there is at least one future branch of P at

uploading, U was a biological person constituted by organism O_1 , born to certain biological parents M and F’.

Summing up, there are common sense cases which suggest that ordinary objects and human persons can become many. Multi uploading may simply be a further case in point. In addition, we have seen that the common sense case for multiplicity does not lead to violations of the logic of identity. The intuitive picture can be put on a solid theoretical foundation.

6.2 Multiplicity and abstractness

Some proponents of the multiplicity objection, such as Goldwater (2021) and Zhan (2024), do not claim that multiplicity is impossible *tout court*. Rather, they maintain that we can only make sense of multiplicity on the assumption that we are *abstract objects* which can be instantiated in multiple places. On this way of spelling out the objection, uploading optimism is either false or implies that we are abstract objects: “So, either this renders survival-by-upload a nonstarter on the grounds that such duplicates would be mere clones, or else a person would have to be an abstract object capable of multiple-instantiation [...]” (Goldwater, 2021, p. 238). You can be multiplied, but only if you are an abstract *type* of which there can be multiple concrete *tokens*. This seemingly conciliatory offer to uploading optimists is poisoned. If the assumption that uploading optimism is true would indeed entail that we are abstract objects, we would have a clear *reductio ad absurdum* of the position.

Uploading optimists should reject the offer, and the above shows that they can. The abstract object version of the multiplicity objection fails just as much as the original one. First, as was shown in §4 and §5, optimists are not bound to accept that we can be multiplied. And §6.1 further demonstrated that multiplicity does not entail abstractness. The fact that one train can continue as two distinct trains does not show that trains are abstract objects. And the fact that a single wombat could have been each of a pair of twin wombats does not reveal that wombats are more similar to numbers than to rocks or mountains. Equally, the assumption that we could be multiplied through uploading does not entail that we are abstract entities, rather than concrete particulars. We should consequently not describe multi uploading as a case where an abstract object receives multiple concrete instances. Rather, it should be described as a case where one concrete object becomes several distinct concrete objects.

7 Multiplicity and conceivability

Before concluding, I want to consider a final worry. Even those who are willing to grant that one train or bush may become several trains or bushes may think that there is some-

t which is F, then both the statement (1) *at* t_2 , $b = a$, and (2) *at* t_2 , $a = c$ come out true, when a has two future branches b and c at t_2 . Even still, inferring from the truth of (1) and (2) to the truth of (3*) *at* t_2 , $b = c$ involves a fallacy of equivocation, since (1) and (2) are made true by different branches, i.e. there is a switch of reference between (1) and (2) (Schwarz, 2014, 1067–1068).

thing deeply problematic with multiplicity in our own case. The thought is that, logic aside, we simply cannot picture what it would be like to branch off into multiple future selves. Multiplicity is inconceivable in our own case. Since conceivability is our best guide to possibility, this suggests that it is impossible for one person to become many. Consider then the following argument:

The Inconceivability Objection Against Multiplicity

- (1) It is inconceivable that a single person could be several distinct persons at other times/worlds.
- (2) If it is inconceivable that a single person could be several distinct persons at other times/worlds, then it is impossible that a single person could be several distinct persons at other times/worlds.

∴ It is impossible that a single person could be several distinct persons at other times/worlds. [Uniqueness]

The problem with this argument is that premise (1) is plausible only on a certain reading of *conceivability*. But on this reading, it is doubtful whether premise (2) holds. On the other hand, on an interpretation of *conceivability* on which premise (2) may be plausible, premise (1) seems false. There is no reading of the argument on which both premises are plausible.

We should distinguish between conceivability/imaginability *from the outside* and conceivability/imaginability *from the inside*.¹⁶ When we imagine a possible situation from the outside, we picture a certain scene from a god’s eye point of view, as it were. On the other hand, when we imagine a situation from the inside, we picture it from the perspective of one of the individuals involved and simulate what it is like to be them.¹⁷ When our own survival is concerned, we tend to imagine the case from the inside.

When *conceivability* is read as referring to imaginability from the inside, premise (1) seems plausible. It seems true that we cannot picture what it would be like to split up into many different persons. The reason is that each of our potential successors has their own conscious perspective. And each conscious perspective is assumed to be individually unified and closed off to other people’s perspectives. Simulating from the inside what it would be like to become several distinct individuals would seem to involve imagining a single stream of consciousness splitting up into many separate streams. But we cannot picture having several disunified streams of consciousness at the same time from the inside. So, our attempt to imagine surviving multi uploading as several distinct uploads from the first-person perspective fails. And even if we could somehow simulate having all the separate conscious perspectives in one stroke, this would arguably distort the envisioned possibility.

¹⁶ I will here not distinguish between conceivability and imaginability. I will also not explicitly consider the distinctions between *positive* vs. *negative* conceivability and between *non-ideal* vs. *ideal* conceivability. For our purposes, the above contrast between conceivability from the outside vs. conceivability from the inside should be sufficient. For the additional distinctions see (Chalmers, 2002).

¹⁷ For the contrast between imagination from the inside and from the outside see e.g. (Vendler, 1979; Shoemaker, 1994; Recanati, 2007; Ninan, 2008; Weber, 2023b, 2024).

The scenario thus imagined would instead corresponds to a situation where we turn into some kind of fragmented super-person, comprising each individual perspective as a part. But this is the wrong conception, since each upload is a complete and separate person in their own right.

Does the fact that we cannot picture from the inside surviving as many uploads show that this is impossible? No, there is no direct link between inconceivability from the inside and impossibility. In fact, there are clear counterexamples to this connection (Weber, 2024, 2023a). For instance, we cannot picture from the inside what it would be like to have bat sonar (Nagel, 1974). But our inability to picture this does not show that it is impossible for us to acquire echolocation, e.g. through surgery. Equally, people who are blind or deaf from birth cannot imagine what it would be like to have vision or hearing. Even still, it may be medically possible for them to later receive these sense modalities. Similarly, we cannot picture from the inside what it is like to lack consciousness, since imagination from the inside essentially involves simulating a conscious perspective. Clearly, this does not show that it is metaphysically necessary that we are always conscious. The link between inconceivability from the inside and impossibility is broken, and there is no reason to accept premise (2) on this interpretation of conceivability. What is more, the above provides a plausible explanation as to why our attempt to picture this possibility from the inside is unsuccessful.

When the argument is read as involving *conceivability from the outside*, it is more plausible that there is a link between inconceivability thus understood and impossibility. On this reading of conceivability, premise (2) may be true.¹⁸ The problem with the argument on this reading is that premise (1) seems false. From the outside, we can, it seems, conceive of situations where one person becomes many different persons. For instance, it is possible to imagine from a third-person perspective how a person symmetrically fissions like an amoeba into two, such that both successors are mentally and physically continuous with the original. Similarly, we can picture from the outside that the two hemisphere's of a person's brain are separated and then put into new bodies, such that both become her successor. And multi uploading may provide another conceivable scenario where one person continues on as several distinct persons.

To sum up, there is no interpretation of the inconceivability objection on which both premises seem true. The intuition that multiplicity for persons does not make sense is arguably based on the fact that we cannot imagine corresponding scenarios from the inside. But this form of inconceivability is not good evidence for thinking that multiplicity for persons is impossible.

8 Conclusion

In this paper I have defended the view that mind uploading is survivable against the popular objection that this entails that we could, *per impossibile*, become multiple different persons. My defence was two-pronged. First, uploading optimists can avoid commitment to the claim

¹⁸ Arguably, the relevant notion should then also be interpreted as *ideal* conceivability (Chalmers, 2002).

that we could become multiple distinct persons. When endorsing a complex account of personal persistence, optimists who reject multiplicity need to include a non-branching clause. Non-branching accounts of personal persistence imply that single uploading is survivable, whereas multi uploading is not. Alternatively, on a simple view of personal persistence, it is plausible that one may survive multi uploading as one particular upload. Either way, uploading optimism in itself does not imply the contentious multiplicity claim. Second, I have argued further that uploading optimists can endorse the idea that we could be multiplied through uploading. In fact, multiplicity is both intuitively plausible and theoretically viable. Mind uploading may therefore not only offer the promise of a digital afterlife, it may offer the prospect of many, many such afterlives.

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