Personal identity and the Phineas Gage effect

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1. A story about Phineas Gage

In 1848, Phineas Gage suffered an extremely severe and tragic railroad accident in which an iron rod was driven through his frontal lobe. Compared to Phineas before the accident, the man after the accident was notably crueler, so much so that some friends and family reported he was 'no longer Gage' (Harlow 1868).

This is a striking qualitative change, but the 'greater significance' of Gage's case is the alleged severing of personal identity between pre-accident and post-accident Phineas (Damasio et al. 1994: 1102). For this reason, scientists (e.g. Rabins and Blass 2009) and theologians (e.g. Murphy 2013) cite Gage's story as evidence about the nature of personal identity. As do philosophers:

There are a variety of criteria that we... employ in deciding questions of the identity of a person across time and change... In cases in which we feel that a person's personality has altered dramatically and drastically, we are inclined to feel 'she is not the same person anymore.' To take a famous case, when an iron bar went through the skull of... Phineas Gage (Searle 2005: 8–9).

One standard explanation of why it might seem the identity relation does not hold here is that part of what matters for personal identity is a *certain magnitude* of similarity between earlier and later individuals (e.g. Duncan-Jones 1968; Quinton 1962; Shoemaker 1970). Phineas Gage's story is typically taken as evidence for this view: when earlier and later individuals are 'dramatically and drastically' dissimilar (as are pre-accident Phineas and post-accident Phineas), it seems they are not numerically identical.¹

But experimenting with historical counterfactuals suggests the Phineas Gage case might actually be evidence for precisely the opposite conclusion. Imagine Gage had undergone an equally intense change in the opposite direction, *improving* rather than *deteriorating*, with reports after the accident

1 Throughout the article I make no claim that such changes do break the numerical identity relation. In fact, I do not even share the relevant intuition; to me, it does not seem that pre-accident Phineas and post-accident Phineas are numerically non-identical. Yet, I do find initial appeal in the broader principle; it does seem there is some certain magnitude of dissimilarity that breaks the identity relation (perhaps a magnitude of dissimilarity greater than even that in the Gage story). Ultimately, whether you or I have these intuitions is irrelevant to the present project. The sufficient motivation is that some interlocutors take such cases as examples of seeming numerical non-identity. Here is also an appropriate time to note that to simply assume that interlocutors with such intuitions have misunderstood the concept of numerical identity is to beg the question against the concept or theory those intuitions are taken to support.

indicating the man was much kinder than Phineas before the accident. In this improvement case, his friends and family might well have claimed he was still Gage, perhaps a Gage who has finally realized his good self, albeit through a bizarre accident (cf. Sorensen 2013: 244).

A pull of conflicting intuitions between this counterfactual 'improvement' case and the historical 'deterioration' case suggests the Phineas Gage case does not support the claim that a certain magnitude of dissimilarity seems to break identity; instead, it shows that whether this is so depends on a further question about the direction of change - whether the change is one of improvement or deterioration.

2. The Phineas Gage effect

To test the prediction that deteriorations are more seen as identity-severing than improvements of an equivalent magnitude, I conducted an experiment. One-hundred and forty participants (mean age = 36, 48% male) were recruited online and randomly assigned to one of two conditions, 'Deterioration' or 'Improvement'. That is, participants saw either a 'Deterioration' scenario or an 'Improvement' scenario. The Deterioration [Improvement] scenario read as follows:

Phineas is extremely kind [cruel]; he really enjoys helping [harming] people. He is also employed as a railroad worker. One day at work, a railroad explosion causes a large iron spike to fly out and into his head, and he is immediately taken for emergency surgery. The doctors manage to remove the iron spike and their patient is fortunate to survive. However, in some ways this man after the accident is remarkably different from Phineas before the accident. Phineas before the accident was extremely kind [cruel] and enjoyed helping [harming] people, but the man after the accident is now extremely cruel [kind]; he even enjoys harming [helping] people.

In these vignettes, the magnitude of dissimilarity is constant between conditions; the magnitude of dissimilarity between the earlier kind man and later cruel man (Deterioration) is comparable to that between the earlier cruel man and later kind man (Improvement). What differs is the direction of the change, whether it is one of deterioration or improvement.

To engage participants with the relevant notion of *numerical* identity, I introduced two disagreeing characters, 'Art' and 'Bart'. In both conditions, participants rated their agreement with the following numerical identity measure on a scale from 1 (Strongly Agree With Art) to 7 (Strongly Agree With Bart):

Art and Bart disagree over what happened in this story. Art thinks that Phineas before the accident and the man after the accident are different in some respects but are still the same person. To Art, it seems like one person (Phineas) experienced some changes. Bart disagrees. He thinks that after the accident, the original man named Phineas does not exist anymore; the man after the accident is a different person. To Bart, it seems like one person died (Phineas before the accident), and it is really a different person entirely that exists after the accident (the man after the accident).

Participants in the Improvement condition agreed more strongly (M=2.61, SD=1.67) than those in Deterioration condition (M=3.26, SD=1.91) that Phineas and the man after the accident are the same person, t(138)=2.17, p=.032, d=.364.

Intuitions about the historical (deteriorating) Phineas Gage are typically taken to show that a certain magnitude of dissimilarity seems to sever the identity relation. But also considering the counterfactual (improving) Phineas indicates that it is not some specific magnitude of dissimilarity that seems to affect personal identity, but whether differences are seen as improvements or deteriorations. Thus, the historical Phineas Gage case does not actually support that dissimilarities of a certain magnitude seem to break the identity relation; rather, it shows that what seems to do so are certain changes for the worse.

3. Beyond Phineas Gage

The view that dissimilarities of a certain magnitude seem to break the identity relation claims support from stories besides that of Phineas Gage. Those thought experiments should be revisited in light of the Phineas Gage effect. Consider, for instance, Parfit's famous Nineteenth Century Russian case:

In several years, a young Russian will inherit vast estates. Because he has socialist ideals, he intends, now, to give the land to the peasants. But he knows that in time his ideals may fade. To guard against this possibility, he does two things. He first signs a legal document, which will automatically give away the land, and which can be revoked only with his wife's consent. He then says to his wife, 'Promise me that, if I ever change my mind, and ask you to revoke this document, you will not consent.' He adds, 'I regard my ideals as essential to me. If I lose these ideals, I want you to think that I cease to exist. I want you to regard your husband then, not as me, the man who asks you for this promise, but only as his corrupted later self. Promise me that you would not do what he asks.' (1984: 327)

Parfit suggests some might think of the older Russian as a different person from the younger Russian, noting that:

if this man's wife made this promise, and he did in middle age ask her to revoke the document, she might plausibly regard herself as not released from her commitment. It might seem to her as if she has obligations to two different people. She might believe that to do what her husband now asks would be a betrayal of the young man whom she loved and married. And she might regard what her husband now says as unable to acquit her of disloyalty to this young man (Parfit 1984: 328).

We should recall that Parfit does not claim the young and old Russian are numerically non-identical. Nevertheless, his Russian Nobleman case is a seminal thought experiment often cited as evidence offered for the view that major dissimilarities seem to sever personal identity (Brink 2003; Buchanan 1988; Schechtman 2014; Velleman 2002).² One standard view is that it is the magnitude of dissimilarity between the younger and older Russian that drives intuitions about their seeming non-identity.

However, perhaps this judgment gains its force from a Phineas Gage effect. as the change described is a deterioration. To test this, I ran a second experiment. I presented 140 participants (mean age = 37, 49% male) with either the original Russian Nobleman Case as quoted above, which is a 'Deterioration case', or a slightly revised 'Improvement' case:

In several years, a young Russian will inherit vast estates. Because he has anti-socialist ideals, he intends, now, to not give the land to the peasants. But he knows that in time his ideals may fade. To guard against this possibility, he does two things. He first signs a legal document, which will automatically not give away the land, and which can be revoked only with his wife's consent. He then says to his wife, 'Promise me that, if I ever change my mind, and ask you to revoke this document, you will not consent.' He adds, 'I regard my ideals as essential to me. If I lose these ideals, I want you to think that I cease to exist. I want you to regard your husband then, not as me, the man who asks you for this promise, but only as his corrupted later self. Promise me that you would not do what he asks.

Some of these philosophers deny or argue against the intuition that there is a break in numerical identity here. For instance, Buchanan (1988: 289) argues against 'those who employ the [Nobleman] example [and] go on to contend that this... is best explained by the judgment that we regard the young nobleman and the middle-aged husband as different person'. Schechtman (2014: 29) denies the non-identity intuition, but also claims that '[a]lthough Parfit uses these [the Teletransportation and Nobleman] cases for somewhat different purposes, they both contribute to the definition and defense of his psychological account of personal identity, and they are certainly not taken to apply to different questions of personal identity'. Again, all that is required for the present project is that some interlocutors take Nobleman case intuitions as evidence offered for or against numerical identity—even if those interlocutors ultimately argue against those intuitions or their applicability to questions of numerical identity.

Next, participants in the Deterioration [Improvement] condition were told about some changes that occur many years later:

Imagine this young man's wife made this promise so the land would [not] go to the peasants. But years later, her husband, now the old Russian, asks her to revoke the document, so as to not give [give] the land to the peasants.

Art and Bart have returned, disagreeable as ever, to provide a measure of numerical identity; participants rated their agreement on a scale from 1 (Strongly Agree With Art) to 7 (Strongly Agree With Bart). Compared with participants in the standard Deterioration condition (M = 3.63, SD = 2.85), those in the Improvement condition agreed more strongly (M = 2.85, SD = 1.83) that the old Russian was the same person as the young Russian, free to release his wife from her promise, t(138) = 2.24, p = .019, d = .400.

We find further evidence that direction of change affects identity attributions from fiction and literature. Consider the science-fictional 'The Enemy Within' (1966), in which a transporter malfunction splits a ship's Captain Kirk into two people, one with the properties of the original Kirk's 'negative side' or 'evil side', the other with the properties of original Kirk's 'positive side'. Without hesitation, the ship's crew refers to positive-Kirk as 'Captain Kirk' and negative-Kirk as 'the impostor'. Both positive-Kirk and

3 'Art and Bart disagree over what happened in this story. Art thinks that the young Russian who did [not] want to give the land to the peasants and the old Russian who does not [does] want to give the land to the peasants are different in some respects but are still the same person. To Art, it seems like one person (the young Russian) experienced some changes; the young Russian did [not] want to give the land to the peasants, and the old Russian does not [does] want to give the land to the peasants, but they are still the same person.

Bart disagrees. He thinks that the original young Russian who did [not] want to give the land to the peasants does not exist anymore; the old Russian who does not [does] want to give the land to the peasants is a different person. To Bart, it seems like one person ceased to exist (the young Russian who did [not] want to give the land to the peasants), and it is really a different person entirely that exists now (the old Russian who does not [does] want to give the land to the peasants).

Because Art thinks the young Russian and the old Russian are the same person, Art thinks the wife should regard herself as not bound by her commitment to the young Russian. Art thinks that since the young Russian and the old Russian are the same person, the old Russian can release the wife from an earlier promise she made to him, making it the case that the land will not [will] go to the peasants.

Because Bart thinks the young Russian and the old Russian are two different people, Bart thinks the wife should regard herself as bound by her commitment to the young Russian. Bart thinks that since the young Russian and the old Russian are different people, the old Russian cannot release the wife from a promise she made to a different person (the young Russian), making it the case that the land will [not] go to the peasants.'

4 Thanks to an anonymous reviewer for recommending this avenue and especially for suggesting *Flowers for Algernon*.

negative-Kirk are dissimilar from the original, but *improved* positive-Kirk is taken as identical and deteriorated negative-Kirk as non-identical to the original.

An especially strong example is found in Flowers for Algernon (Keyes 1966). Charlie Gordon begins as mentally disabled and enters a surgery; afterwards, the post-surgery patient is much more intelligent. Michael Shapiro (2005: 327) cites this part of the story as an example of continuous personal identity despite change and dissimilarity, the story of 'a mentally impaired person who becomes exceptionally intelligent...the new state as embodying his real identity, hitherto suppressed'. There is great dissimilarity between pre-operative Charlie and post-operative Charlie, but with improvement, we intuit identity between them.

However, Flowers for Algernon is more complex. Post-operative Charlie begins to deteriorate, resulting in a less intelligent individual. Unlike the identity-preserving improvement, this 'deterioration' seems an identitysevering 'moment of death' (Cline 2012). This is a particularly striking demonstration of the effect. While pre-operative Charlie (A) seems identical to post-operative Charlie (B), post-operative Charlie (B) seems non-identical to deteriorated Charlie (C). Yet, pre-operative Charlie (A) and deteriorated Charlie (C) are extremely similar to each other (and both are quite dissimilar to (B) post-operative Charlie). What does differ between the comparisons, A-to-B and B-to-C, is the perceived direction of change; A improves to B, and B deteriorates to C.

This example suggests the effect's practical consequence. Consider further the relation between mental illness or disability and personal identity (e.g. Buchanan 1998). It might seem an earlier person's advanced directive does not apply to a (putatively numerically identical) later individual with Alzheimer's if the earlier and later are not, in fact, numerically identical. On a standard interpretation, this judgment is driven by the perceived magnitude of dissimilarity between the earlier and later persons; the latter is so dissimilar from the former that they do not share the identity relation. However, if developing Alzheimer's seems a change for the worse, the non-identity judgment might be driven by the direction of this deterioration.

There are even further complexities than I can treat here. I focus throughout on third-party attributions of identity, but there may be first, second and third person differences. For instance, perhaps post-operative Charlie's own judgment about his non/identity with preoperative Charlie differs from that of a third-party observer. Another complexity involves Charlie's 'improvement'. Though the surgery results in a more intelligent Charlie, it also results in a man more cruel and selfish than pre-operation Charlie (Cline 2012). The examples cited here focus on Charlie's intelligence; presumably (but neither uncontroversially nor unproblematically), here becoming more intelligent is seen as improvement and becoming less intelligent as deterioration. As Cline (2012) puts it: 'the pity we have is for the intelligent Charlie who has descended into oblivion, not for the Charlie who, if we are to truly believe ... others, had a good life before, and could therefore return to that life' (emphasis added).

4. Interpreting the Effect

Recall the commonplace intuition offered about the historical Phineas Gage case: it seems (to some) that post-accident Phineas is non-identical to pre-accident Phineas. Recall also the intuition offered about Parfit's original Russian Nobleman case: it seems (to some) that the old Nobleman is non-identical to the young Nobleman. There is also a commonplace explanation of these intuitions: a certain magnitude of dissimilarity breaks personal identity.

However, the experiments and examples indicate that these thought experiments do not show that some magnitude of dissimilarity seems sufficient to break identity. Instead, they show that such intuitions depend on direction of change. This is a significant result about our understanding of personal identity intuitions about classic thought experiments. The further implications of this discovery for the actual personal identity relation depend on whether we hold direction of change as relevant or irrelevant to personal identity.

First, suppose direction of change is *not* relevant to personal identity. On this view, the finding that direction of change affects identity attributions in these seminal thought experiments is a detection that such intuitions are produced, in part, by a factor we hold as irrelevant to personal identity. This provides a reason to doubt these commonly offered intuitions' status as good evidence about personal identity.

There are a number of possible explanations of why direction of change might have such a pernicious effect on these personal identity intuitions. One plausible interpretation is that intuitions about these cases are mere hyperbolic expressions. Perhaps when people say, 'Gage is no longer Gage', this akin to saying, 'I am not myself today'. But notice that such a hyperbolic interpretation could be offered about non-identity intuitions when considering *just* the original case (e.g. the historical Phineas Gage story). On this interpretation, the experimental finding that direction of change affects these intuitions gives a good reason to think these are, in fact, hyperbolic sentiments and to question the commonly offered conclusions of these thought experiments: the intuitions supporting these conclusions are produced, in part, by the effect of direction of change (which, *ex hypothesi*, is not relevant to personal identity).

Alternatively, suppose direction of change *is* relevant to personal identity. On this view, the experimental results evince not just a fact about personal identity attributions, but also one about the nature of personal identity. Direction of change affects personal identity intuitions in these cases because it is part of what determines the actual personal identity relation.

A challenge for this second view is to respond to certain seemingly plausible countervailing considerations. Even when claiming the non-identity intuition, it might seem there is *some sense* in which (e.g.) deteriorated Phineas is still the

same person as the original; surely some properties and relations remain unaffected by direction of change. For instance, even after deteriorating, postaccident Gage may still appear to be the son of pre-accident Gage's mother, to own the same house, or to owe the same taxes.

In response, one concluding that identity does not hold in such a case might simply reject these additional intuitions; we should infer from the conclusion of non-identity that these other intuitive relations and properties no longer apply. It might appear that (e.g.) deteriorated Phineas retains certain kinship and legal properties of the original, but these appearances are false if he is numerically non-identical to pre-accident Phineas. If pre-accident Phineas and post-accident Phineas are non-identical, the latter does not actually own the former's house or owe his taxes, even if it might seem like he does.

An alternative to rejecting such additional intuitions is to allow that certain relations or properties come apart from numerical identity and are, perhaps, tracked by different notions of identity. Philosophers have proposed a number of identities: numerical, practical, narrative and so on (see e.g. Korsgaard 1989; Mathews et al. 2009; Schechtman 1996, 2014). Perhaps (e.g.) deteriorated Phineas is numerically non-identical to preaccident Phineas, but they are 'legally identical' such that they share tax obligations and property ownership.

Again, this general approach could be offered when considering just the original cases. For instance, when considering only the historical Phineas Gage case, we might claim the two Gages are numerically non-identical but (e.g.) legally identical.⁸ On this second interpretation, the discovery

- This rejection may become more plausible when we evaluate whether these additional claims are, in fact, intuitive. To a large extent, this is an open question; what are the intuitions about additional properties like familial relations, owned properties, and owed taxes when we intuit (non-)identity in these types of cases? There is some evidence intuition rests against the severability of these additional properties from numerical identity. Recall it was Phineas's family and friends who claimed he was 'no longer Gage'. If asked 'who is your son/brother/relative?' it seems these family members would more likely claim 'Gage, the man before the accident, and not this other person' than 'Gage, the man after the accident, and not that other person'. Yet, different cases suggest otherwise. Even if the old Russian Nobleman is a different person, we seem to confidently assert that the young Nobleman's wife is still the wife of the old Nobleman. On the other hand, in this case certain moral and legal properties seem to follow the (non-)identity intuition. Recall the intuition that the deteriorated old Nobleman is a new person and that, as such, he cannot allow the wife to revoke her promise, which would void the contract of the young Nobleman.
- There are obviously a number of possible permutations, dependent on the number of identities in our theory. For instance, we may claim the two Gages are numerically identical, but practically non-identical, or that they share a narrative and legal identity, but not a numerical or practical one. The possibilities continue. We may wish to proceed with some caution in asserting the existence of many identities, as the assertion of each new identity type weakens the analytic purchase of the others (see, e.g. Brubaker and Cooper 2000).

that direction of change affects numerical identity might be seen as evincing these kinds of distinct identities. For example, if we hold that tax obligations do not depend at all on direction of change but that numerical identity does, this suggests tax obligations come apart from numerical identity and that perhaps these obligations are grounded instead in some other identity.

Thus, the experiments and examples present a choice about how to revise our theory of personal identity. If direction of change is not actually relevant to personal identity, we have reason to doubt the results of classic thought experiments since we now know intuitions about these cases are partly produced by this factor. Alternatively, we may conclude that direction of change is relevant to personal identity. If so, the Phineas Gage effect encourages reevaluation of conventional wisdom about personal identity. Personal identity is often taken as a foundation upon which to apply moral and legal notions like responsibility, desert, and blame (e.g. Butler 1736; Locke 1694; Reid 1785), but the relationship between personal identity and normative notions may be more complex. Personal identity and normative notions may be more complex. Personal identity and normativity do share important relations, but these do not flow purely from the foundations of personal identity to normative conclusions: normative considerations exert influence from the start.⁹

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On behalf of St Anselm

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In God, Freedom and Evil Alvin Plantinga (1974: 90–91) proposes that Gaunilo's parody of Anselm's argument (Gaunilo 1965: 163) fails because