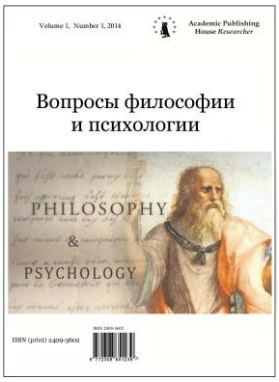

Published in the Slovak Republic
Voprosy filosofii i psikhologii
Has been issued since 2014.
E-ISSN 2414-0856
2019, 6(1): 3-7

DOI: 10.13187/vfp.2019.1.3
www.ejournal20.com

Articles and Statements

Memory and Identity: Some Remarks from Neuroscience

Marcos Alonso Fernández [a, b, *]

[a] Yachay Tech University, Ecuador
[b] Uehiro Centre for Practical Ethics, University of Oxford, UK

Abstract

Memory has always been understood as the basis of human identity. However, current neuroscientific data about how our brain creates memories makes it problematic to maintain certain identity theories, particularly the psychological view on identity. In this paper we will expose this neuroscientific data regarding memory, how it should affect the debate around identity, and the consequences of this discussion for ethics as a whole.

Keywords: memory, human identity, narrative identity, neuroethics.

1. Introduction

Human identity has been a never-ending source of debate among philosophers. Its importance goes from metaphysics to aesthetics, although its most relevant implications are found in ethics. For many authors, identity is one of the key traits for morality, as defining who we are is the same as stating our values and purposes. Socrates, widely recognized as the father of ethics, made the Delphic maxim "know thyself" his own intellectual and personal motto, pointing to the strong connection between identity and morality.

For many centuries, the quest to understand identity was exclusively a matter of philosophy and theology, leaving science somewhat aside. However, in the last centuries, especially since the emergence of modern biology, science has shown it has a lot to say about the interpretations and ideas humans hold about themselves. Today, it seems quite unreasonable to philosophize turning our back on scientific data. One mistake of this kind would be, for example, not taking into account what neuroscience has revealed about human memory in our investigations about identity. Yet, many theories regarding identity are still based on the scientific knowledge of centuries ago. As we will show, bio-technological developments are forcing philosophy to radicalize our questions about this matter. And we must be up for the challenge.

2. Psychological and biological identity: the brain transplant thought experiment

One great effort to address these new problems regarding human identity is DeGrazia´s *Human identity and bioethics*. DeGrazia distinguishes between biological, psychological and

* Corresponding author
E-mail addresses: malonso@yachaytech.edu.ec (M. Alonso Fernández)

narrative identity. DeGrazia, a firm proponent of the biological view regarding identity -a view condensed in the thesis that "we are essentially human animals" (DeGrazia, 2005: 8) – dedicates a major part of the book to a debate with the psychological view, the predominant theory regarding identity. The psychological view, defended most notably by John Locke (1690) in the 17th century and in the last decades by Derek Parfit (1984), understands that personal identity consists in the "continuity of a mental history over time, where present and past transient moments of awareness are connected by memory" (DeGrazia, 2005: 14)[*].

The shortest way to sum up this debate is exposing the different views towards Shoemaker´s case of a hypothetical brain transplant (Shoemaker, 1963: 23-24). In this thought experiment, we are asked to imagine our brain transplanted to another´s person head. As farfetched as the example is, it holds the value of showing explicitly the divergence between biological and psychological identity proponents. Psychological view advocates would say that I am wherever my brain (creator of my mental states) is; whereas biological view advocates as DeGrazia would claim that my identity stays within my body.

It is true that our intuition, or better put, our first impression, is that there is no fundamental problem with moving our mind to another body; many films, shows and novels have operated under this premise. But I will argue this is only an ilusion, very similar to the possibility of other animals talking: we can imagine it without problems, many films and books take it for granted, but in the real world it just isn't possible. Biology doesn´t work that way, and to be able to talk you need the specific vocal tract only the human body has. As DeGrazia correctly states: "our imaginative investigations should take place within the constraints of what we know about the world" (DeGrazia, 2005: 48).

Boniolo also criticizes this careless use of mental experiments. Particularly because most of recent discussions on human identity are still using the scientific background of modern philosophers as Descartes, Hume or Locke. Regarding the brain transplant thought-experiment, Boniolo asks himself whether "are we right in discussing it nowadays, more or less in the same terms and after almost four centuries of biological discoveries, in particular neurobiological ones?" (Boniolo, 2005: 50). The obvious answer is that we aren´t. We should severely limit the use of thought-experiments, and when we do use them, we should base them on our current scientific knowledge. A knowledge that, as I am arguing, renders some ideas and metaphors obsolete.

3. Memory and identity

This experiment and the ideas we have discussed show that the psychological view, while concordant with many people´s intuitions, reveals itself very problematic when we understand the biological basis of memory, how it really functions, what purpose it serves and how fragile and malleable it is. The psychological view on identity assumes that memory works as some kind of deposit from we can retrieve information we have previously stored. But nothing in the way our brain works supports this conception of memory. Memory is nothing more than synaptic connections strengthened over time (Boniolo, 2005: 67). As O´Shea explains, the key to memory are neuronal synapses and their strength (O´Shea, 2005: 98). Nobel Prize winner E. Kandel[†] discovered that there are a particular kind of neurons, modulatory neurons, which can strengthen the synapses between the sensory neurons and the motor neurons (O´Shea, 2005: 95). What the modulatory neurons basically do is start a process which involves a synaptical serotonin secretion, that triggers cyclic AMP, which in turn activates kinase, which modifies the properties of some particular proteins by adding a phosphate molecule to them (O´Shea, 2005: 95-96). This phosphorylation delays the connection between sensory and motor neurons from dissappearing, strengthening their connection and making their future connections easier. When this phosphorylation is temporary, it produces short-term memory; when it is stable (because is gene induced), it produces long-term memory. This depends primarily on the number of times the modulatory neurons repeat this process, which in turn depends on the number of times the action triggering the modulatory neuron is repeated (O´Shea, 2005: 96-97).

[*] For some relevant literature on identity: Shoemaker (1963); Wiggins (1967); Williams (1970); Parfit (1984); Ricoeur (1995); Schechtman (1996); Olson (1997); Martin (1998); Baker (2000); and McMahan (2002).

[†] For a retrospective on the last decades of neuroscientific research on memory: Eric R. Kandel, "The Biology of Memory: A Forty-Year Perspective", (2009).

A first reaction to this highly technical description could be thinking this kind of detail doesn't concern philosophy and the theories we elaborate based on practical observation and common sense. "What if scientists discover the inner functioning of my neurons when I recall something? What matters is my experience when I do so". This wittgensteinian counterargument seems powerful, but ultimately I think it is not correct. And the key is that this so-called "experience" of remembering is always mediated by out conceptions about reality. This way, when we "experience" recall as retrieval from a drawer in our mind, we have already been predisposed to have that experience because of our previous understanding of the matter. If we instead spread a more accurate, science based, conception of memory, our experiences will also follow suit.

4. The shortcomings of psychological identity

The container metaphor of memory implied in the psychological view of identity, is also false and misleading because of another common misconception: the belief that memory is concerned with fidelity. Human biological memory is directed at having the amount and type of information that is useful for the life it supports (Quian Quiroga, 2017: 39-40). And what evolution has decided as useful in this regard is to retain very little information and emphasize creation. The key point is that our memory aims for meaning, not data. As Quian Quiroga explains, memory is "based on the construction of meaning, an interpretation of the outside world that relies on selecting a minimum of information and making abstractions – while discarding a multitude of detail" (Quian Quiroga, 2017: 48)[*]. This is the explanation as to why "We remember almost nothing" (Quian Quiroga, 2017: 17)[†].

Our identity, therefore, cannot be something stored in our brain that is retrieved and connected, as the psychological view proposes. Our biological memory is not a container, but a web or reticule that is continuously reshaping and changing. As Liao and Sandberg put it, "our memories are constantly reinterpreted in an ongoing project to construct a self" (2008: 91–92). Following this idea, we could even go as far as to say that the mere concept of "psychological continuity" is very problematic. What do we really mean by it? I would say that the underlying idea of this concept is, once again, the container metaphor of memory: the different mental states are understood as links of a chain, photos in an album, storaged in some way that would let us pick them up and establish comparisons between them. But there is nothing in the way our brain generates memory that resembles this or makes this metaphor valid.[‡]

Returning to the brain transplant case, we can see how "psychological continuity" is a very problematic concept if we try to understand it from current neuroscientific perspective. As Boniolo explains, "anytime we intervene to retrieve memories, our mnestic action is performed by a brain different from the brain that stored them. Anytime we reorganise our memories, we change the synaptic connections, also by creating new ones" (Boniolo, 2005: 69). In this brain transplant case,

[*] Konrad et al. go on more detail explaining that "Organic memory has four different strategic biases. First, people tend to remember more positive than negative events (Walker et al., 2003). Second, negative details of individual events are forgotten more than positive details (Mitchell et al., 1997). Third, there is an emotional asymmetry in the time course of past events with negative affect fading more rapidly than positive affect (Walker, Skowronski, 2009). Finally, the ways that people view past events become less self-focused over time, indicating adaptive distancing from negative experiences (Campbell, Pennebaker 2003)" (Konrad et al., 2016: 2)

[†] As Quian Quiroga says, "this is perhaps the greatest secret in the study of memory: the astounding truth that, starting from very little information, the brain generates a reality and a past that makes us who we are, despite the fact that this past, the collection of memories, is extremely slippery; despite the fact that the mere act of bringing a memory to our consciousness inevitably changes it; despite the fact that what underlies my awareness of a unique, immutable "self" that makes me who I am is constantly changing." (Quian Quiroga, 2017: 17). One impressive fact is that "the memory we keep of all the images we see in a lifetime amounts to approximately as much information as that sent by the eye to the brain in just two minutes" (Quian Quiroga, 2017: 64).

[‡] As Kandel explains, "psychological concepts, which had been inferred from purely behavioral studies, could now be explained in terms of their underlying cellular and molecular mechanisms" (Kandel, 2009: 12749). In this regard, the last decades of neuroscience gaining ground in place of psychology can be interpreted as the rightful reintegration of psychology in biology. It never ceased to surprise that psychology, which etymologically is the investigation about *psyche*, life´s principle as Aristotle put it, was understood apart from the general investigation of life, biology.

what presumably would happen is that the brain, after one first moment in which it would be physically identical to how it was before the transplant, it would start changing, in the sense of physically altered: its synapses would change and new synapses would be created, trying to make sense of the changes involved in having a new body. After this great initial shock (similar to a psychotic break), neural plasticity would come into action and the brain would reshape itself to make sense of its new corporal configuration, probably through a massive amnesia of life prior to the transplant. From that point on, this human would rebuild her identity through the external cornerstones she would have: her body, her family and friends, photos, objects, places, and, finally, the narrative she would eventually create.

Assuming there is no biological impossibility to this procedure at a genetic and immunological level – which, as Boniolo points out (Boniolo, 2005: 51-52), is quite an assumption – what we would inevitably have is a new brain that would have substantially different synapses and therefore would generate a substantially different memory. In this case I would be more inclined to say that a human was given a new organ, and that this organ, even if it is the brain, doesn´t entitle the donor to "claim" the whole body. Of course, the changes this brain-transplanted human would undergo would be enormous; but, as we do with an amnesic friend, we wouldn´t just forget about her and treat her as we never met: what we would do is to try, little by little, to restore her narrative, telling her what her name is, where does she live, what does she do for a living, who is she related to, who are her friends, etc.

5. Body and narrative as the sources of identity

The conclusion is that we cannot base identity (primarily) on memory. Because it is metaphysically not sound as an interpretation, but also because it derives in a myriad of practical problems. Even though we tend to think so, we actually don´t base identity on memory, because we unconsciously know how problematic memory is. Loftus´s works (Loftus, Ketcham, 1994; Loftus, 1997) clearly demonstrate the untrustworthiness of testimonies and the possibility of false memory implantation. As Liao and Sandberg explain, "There is also much research that shows that false memories can be induced. The memory retrieval process is to a large degree reconstructive rather than a faithful representation of the original experience, and can be affected by information available at the time of recall". (Liao, Sandberg, 2008: 88)

In cases where identification is very relevant, we base it on the source of our identity: our body. The main proofs of my identity when, for example, I need to go through customs, are not my "mental states", but body related elements as my physical appearance or my fingerprints, documents as my passport or my identification card, and more recently, direct biological proofs like DNA tests. If memory was the key to identity, we couldn´t deny a madman who believes himself to be Julius Caesar. If we deny it, it is because there are external elements -his appearance, his language, calendars, buildings, etc. – that clearly show he is not Julius Caesar.

The aspect of identity linked to our story is much better captured by narrative views on identity. The idea of telling and retelling a story is much closer to what happens in our brain and our synapses than the idea of storage and retrieval. However, these narrative theories are often not complemented with scientific – mostly neuroscientific – data from which they could get much support. Putting narrativity in the center of our identity generation process would also help understand "psychological continuity" precisely as a product of narratives, that reinforce certain loops creating this sense of continuity. In this paper we cannot, obviously, go this far. Nonetheless, the explanation we have carried out of the real functioning of memory, and the demonstration of psychological identity´s unsustainability, is an optimum starting point to perfect our ideas on memory, identity, and ultimately, ethics.

6. Conclusion

To sum it up, in this paper we have criticized some common misconceptions regarding memory and identity. First, we showed that theories of identity based on an outdated comprehension of memory should be revised. From current neuroscientific data, memory cannot be understood as a deposit from where we retrieve information. Human memory is much more malleable and creative, and this should change our view on identity. We defended that the "psychological continuity" proposed by the psychological view on identity is flawed because of its reliance on an outdated understanding of memory, and that we should instead advocate for a view

of identity based on our body (our biology, in a more ample sense) and narrativity. This last part could not be fully exposed, but at least we put forward an idea of what an alternative to what we criticized could be. Given how important these topics are for the identity debate, and for ethics in general, we believe changing our perspective and categories on memory and identity, as we defended should be done, would be very beneficial.

References

Baker, 2000 – *Baker* (2000). Persons and bodies: a constitution view. Cambridge: Cambridge University Press.

Boniolo, 2005 – Boniolo (2005). The Ontogenesis of Human Identity. *Royal Institute of Philosophy Supplement,* 80(56), 5.

Campbell, Pennebaker, 2003 – *Campbell, Pennebaker* (2003). The secret life of pronouns: Flexibility in writing style and physical health. *Psychol. Sci.* 14: 60-65.

DeGrazia, 2005 – *DeGrazia* (2005). Human Identity and Bioethics. New York: Cambridge University Press.

Kandel, 2009 – *Kandel* (2009). The Biology of Memory: A Forty-Year Perspective. *The Journal of Neuroscience*, October 14, 29(41): 12748-12756.

Konrad et al., 2016 – *Konrad, Isaacs, Whittaker* (2016). Technology-Mediated Memory: Is Technology Altering Our Memories And Interfering With Well-Being? In *ACM Transactions on Computer-Human Interaction*, 23(4), Article 23, 29 p.

Liao, Sandberg, 2008 – Liao, Sandberg (2008). The normativity of memory modification. *Neuroethics*, 1: 85-99.

Locke, 1690 – *Locke* (1690). An Essay Concerning Human Understanding. Oxford: Clarendon Press.

Loftus, 1997 – Loftus (1997). Creating false memories. *Scientific American,* 277(3): 70-75.

Loftus, Ketcham, 1994 – Loftus, Ketcham (1994). The Myth of Repressed Memory. False Memories and Allegations of Sexual Abuse. New York: St. Martin Press.

Martin, 1998 – *Martin* (1998). Self-concern: an experiential approach to what matters in survival. Cambridge: Cambridge University Press.

Mitchell et al., 1997 – *Mitchell, Thompson, Peterson, Cronk* (1997). Temporal adjustments in the evaluation of events: The "rosy view". *J. Exp. Soc. Psychol.* 33: 421-448.

O'Shea, 2005 – *O'Shea* (2005). The Brain. A very short introduction. Oxford: Oxford University Press.

Olson, 1997 – *Olson* (1997). The Human Animal. Oxford: Oxford University Press.

Parfit, 1984 – *Parfit* (1984). Reasons and persons. New York: Oxford University Press.

Quian Quiroga, 2017 – Quian Quiroga (2017). The forgetting machine: memory, perception, and the "Jennifer Aniston neuron". Dallas: BenBella Books.

Ricoeur, 1995 – Ricoeur (1995). Oneself as Another. Chicago: University of Chicago Press.

Schechtman, 1996 – *Schechtman* (1996). The constitution of selves. Ithaca: Cornell University Press.

Shoemaker, 1963 – *Shoemaker* (1963). Self-Knowledge and Self-Identity. Ithica, NY: Cornell University Press.

Walker al., 2003 – *Walker, Skowronski, Thompson* (2003). Life is pleasant – and memory helps to keep it that way! *Rev. Gen. Psychol.* 7: 203-210.

Walker, Skowronski, 2009 – *Walker, Skowronski* (2009). The fading affect bias: But what the hell is it for? *Appl. Cogn. Psychol.* 23: 1122-1136.

Wiggins, 1967 – Wiggins (1967). Identity and Spatio-Temporal Continuity. Oxford: Blackwell.

Williams, 1970 – *Williams* (1970). "The self and the Future". *Philosophical Review*, 79 (2): 161-180.