

Selfhood

How deeply ingrained is our sense of self? Are humans the only species to experience this, and how can it be affected in pathological states?

Introduction

Where does our self come from? Descartes (1637) argued that it comes from conscious thought. Yet, studies show that children begin to develop some form of a self at around 1 to 2-years-old (Amsterdam, 1972; Nielsen *et al.* 2006). Children this age are not consciously aware of much and have quite simplistic thoughts but display signs of a sense of self. One might argue this is because selfhood is intrinsic; children unconsciously develop a basic self-concept because it is hardwired into our brains. The fact that great apes exhibit signs of a sense of self could be further support for this idea. Perhaps, we and other great apes are capable of this because of brain circuitry we have inherited or evolved from common ancestors. However, some studies demonstrate that our sense of self may be, in fact, fragile and highly suggestible. These studies propose that the self is heavily influenced by our culture, social roles, and various psychological conditions. Although, there are many definitions of the term 'self'. In this essay, the phrase 'sense of self' will be used in reference to awareness of one's physical body, consciousness of one's mental states and desires, one's perceived identity, and a sense of continuity within that identity.

Great Apes and the Self

Mirror Self-Recognition (MSR) tests suggest that great apes across all species have a sense of self (SOS) (Gallup, 1970). One could argue that this is because selfhood is innate in great apes. MSR tests were first conceived by psychologist Gordon Gallup. Gallup placed spots of an odourless, non-irritating, coloured dye on the faces of the apes whilst they were anaesthetised. They were located in various parts of their faces they could not see without a mirror. The subjects were then placed in front of a mirror to observe their reactions. In his 1970 study, Gallup found that all chimpanzees touched the marked areas of their faces. Being the most genetically and phylogenetically similar species to humans, this may be because selfhood is inbuilt in brain regions that both species have inherited or evolved from common ancestors. This is supported by the fact that other primates have been found incapable of self-recognition (Suarez and Gallup, 1981; Lethmate and Dücker, 1973; Povinelli *et al.* 1989). Despite having been exposed to its own reflection for 2,400 hours in 5 months, Gallup found that the crab-eating macaque failed to pass the MSR test.

Nevertheless, Gallup's findings show that a degree of learning is necessary. In 1970, Gallup presented four chimpanzees with a mirror for 10 days. In the first few days, they reacted to their reflections as they would another chimpanzee. Yet, after around 3 days, they began using the mirror to

groom themselves. Similarly, chimpanzees reared with no social interaction showed no self-recognition regardless of the extent of exposure to their reflection (Gallup, 1971). This does not necessarily contradict the theory that selfhood is innate in great apes. A possible explanation is that there is a critical period for the development of self-recognition: social interaction is necessary during these periods to ensure normal development in the relevant structures. If so, how is one's SOS fragile in adulthood? The key is in the previous sentence: 'social interaction'. It may be that, throughout our lives, our SOS is moulded by social influence.

Vicki — a chimpanzee raised by human scientists — was asked to sort pictures into the piles 'human' or 'animal'. Without hesitation, she put her own picture in the 'human' pile (Hayes and Nissen, 1971). Her interaction with humans had induced a flawed view of herself.

Humans and the Developing Self

What implications do these findings have for humans? The development of the SOS in humans appears to be systematic. This potentially supports the theory that selfhood is hardwired in the brains of great apes. Children typically pass the MSR test at 15 to 24-months-old (Amsterdam, 1972; Nielsen *et al.* 2006). This is also the stage at which children start to use self-referential terms such as 'me' and 'mine' (Tangney, Stuewig and Mashek, 2007). At around 4-years-old, children start to display signs of 'theory of mind' ToM — the ability to assess one's own mental state and infer that of others (Kelemen, 2004). Later, between 7 and 9-years-old, children acquire a sense of agency; they become aware of and base their identity on their ability to meet culturally-valued goals (Piaget, 1970). Thereupon suggesting that, by the age of 9, much of our physical and psychological SOS is already established. Self-continuity, however, takes longer to develop. By 3 to 4-years-old, children are able to recall episodic memories and describe their role in them (Fiuvisish, 2011). Nonetheless, they do not yet have an autobiographical SOS; they do not integrate these memories into a 'life story'. Erikson (1963) and McAdams (1985) found that people start to draw connections between their past and present self in adolescence. These ages could be the critical periods for the development of selfhood alluded to in the previous paragraph.

Although, an interesting question is, *why* do these aspects of the self emerge at different times? This may be because they progress and operate independently of each other. In that case, our SOS is more deeply ingrained because loss of one aspect would not diminish the whole: it would take damage to the brain circuitry responsible for all of these independent aspects for someone to lose their SOS. In fact, there is case study support for this idea. In 2010, Klein and Lax studied patient D.B. He was a 79-year-old man who became profoundly amnesiac after going into cardiac arrest. He claimed to be "unable to recollect a single thing he had ever done or experienced from any period in his life". Still, his trait ratings of himself were consistent and lined up with the ones given by his daughter. It may be that he lost his episodic memories but not the semantic memories of his identity. Thus, although our perceived identity forms from our episodic memories, perhaps they operate independently of each other, making our SOS, as a whole, more concrete.

The Self: A Chameleon

How does one know who they are? The majority of people would probably argue that *they* define their identity. Yet, to return to the example of the chimpanzee Vicki, her view of herself was completely skewed by the social influence of the scientists around her. Again, the majority of people would argue this case is irrelevant to humans as we are much more complex and therefore resistant to social influence. But are we?

Studies into the effect of culture on the self would disagree. For example, using a personality test known as the Twenty Statements Test, Heine and Butchel (2009) found that East Asians had a tendency to base their SOS on their social roles (e.g., 'I am a father'), whereas North Americans based their SOS on their perceived traits and habits ('I am extroverted'). Such findings generally argue that people from 'individualist' cultures view identity as what makes them different from everyone else, whereas people from 'collectivist' cultures view identity as what you contribute to your community. This contradicts the theory that our SOS is inherent as these studies propose that there is no notion of self that is universal to all human beings. This implies that selfhood is learnt because our notion of it is often the one taught to us through our culture. This theory is supported by brain scans: when Western participants thought of themselves, they showed activation in their medial prefrontal cortex (mPFC), (Craig *et al.* 1999; Kelly *et al.* 2002; Lieberman *et al.* 2004; Gutchess *et al.* 2006). Whereas, when Chinese participants with Christian or Buddhist beliefs thought of themselves, they showed activity in the dorsal PFC rather than the mPFC (Han *et al.* 2008). One could say these findings show that something as fundamental as where in our brain our SOS is generated can be altered by social influence. However, Han *et al.* (2008) is only one study in which culture affected this general trend and it features participants from a very specific demographic. Hence, these findings do not necessarily represent cultural differences across a wider population or may have been anomalous.

Yet, the idea that our SOS is quite susceptible to external influences remains quite compelling. Our identities naturally change as we age: few people would be described as having the same personality and ambitions when they were five, 5, 20 or 40 years later. Our identities also change around different social groups: someone may seem far less spontaneous and "wild" around their parents compared to with their friends. They also change with our circumstances: a person could become much less assertive after losing a job or partner. To return to the case of D.B., perhaps, his identity remained the same before and after the accident because the external factors that influence it remained the same: he was still a father, a man, elderly, and living in the same area and how he was viewed by others, as a result, remained the same. Nevertheless, this is a study of only one patient so one cannot say for certain that other people's identity would be affected by losing their episodic memories in the same way.

Psychopathology and the Self

"One's centre gives way...the 'me' becomes a haze and the solid centre from which one experiences reality breaks up like a bad radio signal". This is a quote from the book *The Centre Cannot Hold: A Memoir of My Schizophrenia* by Elyn Saks (2007). In her psychotic episodes, Saks felt a disconnect from reality in general but also from her SOS. She would lose sight of her identity and vividly believe false ones. For example, one recurring delusion was that she was a mass-murderer that had killed people with her mind. Several studies have linked schizophrenia to social and biochemical environmental factors. For example, Tenari *et al.* (1987) found that incidence of schizophrenia was significantly higher in people raised in "disturbed" adoptive families. Walker, Downey and Bergman (1989) found similar results for individuals with their biological families. Additionally, Verdoux,

Tournier and Cognard (2005) found that adolescent drug use – marijuana in particular – increased incidence of psychosis. Previously in this essay, the idea that one’s SOS is inbuilt in specific brain regions was mentioned as a strength. Yet, these findings imply that, perhaps these regions are vulnerable to environmental factors. Although, research also suggests that, as well as environmental factors, there are certain genetic predilections that lead to schizophrenia. For example, Caspi *et al.* (2003) found that cannabis use only increased risk of developing schizophrenia in people with a particular allele of the COMT gene. Hence, perhaps these brain regions are only liable to such impairments in people with particular genetic predispositions.

Conclusion

In sum, our ability to establish an SOS is hardwired in our brains: all great apes have this capability (Gallup, 1970) most likely because it is encoded in certain circuits of the brain. This also explains why this capacity is absent in other primates: they lack these brain circuits or have underdeveloped ones compared to great apes. Whereas, in humans, the process of our SOS emerging is systematic because that is the natural functioning of these brain circuits.

This idea is further reinforced by the fact the different aspects of our selves emerge at different stages in this process. This may be because these different facets (such as the episodic memory of one’s life, semantic memory of one’s personality, visual recognition or sensory perception of one’s body) are produced by different areas of the brain. This makes the self as a whole more ingrained because damage to one single feature has less of an effect on the whole. One could argue this is supported by the case of D.B. (Klein and Lax, 2010), whose episodic memories were gone but retained a semantic sense of identity. Although, this is a study of only one patient so it does not necessarily represent the effect losing one’s episodic memories would have on everyone.

The contents of our SOS, contrastingly, are susceptible to external influences. How we perceive ourselves can be largely influenced by our culture (Hein and Butchel, 2009). There is a possibility that culture can even influence which brain regions produce our SOS (Han *et al.* 2008). However, these findings have yet to be replicated for this theory to be considered valid. Nonetheless, the nature of our SOS is quite evidently shaped by our social groups, circumstances, and aging, further emphasising that our identities are not fixed.

Similarly, based on studies of the possible environmental causes of schizophrenia, one could conclude that one’s SOS is liable to inhibition due to emotional trauma or substance abuse. Although, research such as Caspi *et al.*’s 2003 study of incidence of schizophrenia demonstrate this may only be applicable to people genetically predisposed to developing such disorders.

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