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Issue: *Perspectives on the Self***What do you think you are?**

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Here, what might be considered a universal belief in dualism is integrated with developmental perspectives on the emergence of identifying the mental and physical components of the self. Additionally, work to “localize” the self is introduced.

“Pig valves.” Rabbit tries to hide his revulsion. “Was it terrible? They split your chest open and run your blood through a machine?”

“Piece of cake. You’re knocked out cold. What’s wrong with running your blood through a machine? What else you think you are, champ?”

A god-made one-of-a-kind with an immortal soul breathed in. A vehicle of grace. A battlefield of good and evil. An apprentice angel.

—JOHN UPDIKE, *Rabbit at Rest*

Humans have long wondered about the nature of our conscious selves. Are we immaterial souls, essentially different from material things such as chairs and trees and our own physical bodies? Or is mental life the by-product of the physical workings of the brain, in much the same way that the capacities of a computer emerge from low-level physical processes? (The usual slogan here is “The mind is what the brain does”). Perhaps the right theory of selves will be based on the interaction between our brains and our environments, especially our social environments. Or, as some skeptical philosophers would argue, is the very notion of a self (and consciousness, and free will) an illusion, having no place in a mature scientific understanding of the universe?

This mystery is, perhaps fortunately, not the topic of our current paper. We are interested here in a simpler and more tractable question, one that runs parallel to the harder one: How do people naturally think of themselves? What is the commonsense conception of self?

It is possible that there is no answer to this question. Perhaps individuals have radically

different conceptions, depending on their religious background, their scientific views, and their philosophical views, explicit or otherwise. It is also possible that most people have no conception of the self at all, simply because they have never given the issue any thought.

We will suggest here, however, that there is evidence for two universal beliefs about the self. These show up in all cultures, emerge spontaneously in development, and are hard to shake, even by those of us who consciously believe that they are mistaken.

The first belief is that the self is nonphysical (see Ref. 1, which is the basis for much of the discussion that follows). In other words, we naturally subscribe to the philosophical doctrine known as *dualism*, most elegantly articulated by Rene Descartes.²

Indeed, Descartes’ most famous argument for the metaphysical truth of dualism was based on his own intuitions. In 1641, he embarked on his plan of philosophical skepticism. He knew that a lot of what he believed could be false; after all, certain lunatics, “befogged by the black vapors of the bile,” believe that they are kings, or that their heads are made out of clay, or that their bodies are glass. Although Descartes refused to entertain the possibility that he himself might be a lunatic, he noted that when he slept, he dreamed the same things that lunatics imagine while they are awake. How could he be certain that he was not now asleep? Or that everything he perceived and knew to be true was a result of the diabolical manipulations of an evil demon? How, then, could he trust *any* of his intuitions?

Descartes concluded that the one thing he could not be deceived about was the fact that he, himself, existed: I think, therefore I am. He added: “So this self, that is to say the soul, through which I am what I am, is entirely separate from the body, and is even more easily known than the latter, so that even if I did not have a body, my soul would continue to be all that it is.” Descartes concluded that he was not his body and could exist even if his body did not.

This does seem to make sense in certain discussions. Indeed, the afterlife beliefs expressed in many of the world’s religions entail this dualist metaphysics, in which the self is separate from the body and can survive its destruction—we ascend to heaven, descend to hell, occupy another body, or enter a spirit world.

This metaphysical stance might be rooted in an early-emerging distinction between the mental and the physical. The psychologist Henry Wellman proposes that “young children are dualists: knowledgeable of mental states and entities as ontologically different from physical objects and real events” (p. 50).³ His conclusion is based on a series of influential experiments. In one of them, young children were told stories involving mental entities versus physical entities. For instance, one tale was about one boy who had a cookie and another boy who was *thinking* about a cookie. Even three year olds understand the difference between a real cookie, which can be seen and touched by another person, and an imagined cookie; conversely, an imagined cookie can be mentally transformed by the person who is thinking about it, but a real cookie cannot be transformed.

Now this is not the same as Cartesian dualism; if children believe that these mental states are coextensive with physical states (specifically, brain states), then they are not dualists in the interestingly Cartesian sense.

There is, however, some evidence for a stronger dualism in children. Jean Piaget found that up until the age of about eight, the children he studied had little understanding of what the brain was for. Modern American and European children are more precocious than this. Five year olds know where the brain is, and they know that people and other animals cannot think without a brain. But they do not usually understand that the brain is needed for physical action, such as hopping or brushing your teeth, and they do not think the brain is needed for an activity like pretending to be a kangaroo. And

if you tell these children a story in which a child’s brain is successfully transplanted into the head of a pig, children agree that the pig would now be as smart as a person, but they think that it would still keep the memories, personality, and identity of the pig. Indeed, the natural conception of the brain by children, even after science education, is that it is a tool we use for certain mental operations. It is a cognitive prosthesis, added to the soul to increase its computing power.

Indeed, we doubt that this understanding is much different from that of many adults. Much excitement is generated by recent studies showing increased neural activity—certain parts of the brain “lighting up” in a scanner—when subjects think about such intimate and important topics as religion, or love, or race. The details of these findings are plainly relevant for theories of the location and time course of different mental activities, but people often seem fascinated by the mere fact that the brain is involved at all. We are astonished because we feel that *we* love and hate and believe in God, not our brains. Such astonishment betrays the dualist intuitions of even the most scientifically literate adults.

The proposal so far is that people think that they are immaterial; we are not identical to our physical bodies. But there is an interesting way in which our commonsense dualism departs from Descartes’ dualism. Consider how Descartes summarizes his conclusion: “I realized that I was a substance whose essence, or nature, is nothing but thought, and which, in order to exist, needs no place to exist nor any other material thing.” For Descartes, then, the soul “needs no place to exist.” But we would suggest that our commonsense assumption is that it does have a place. More specifically, the second commonsense assumption about our selves is that *we exist inside our heads*.

There has been little empirical research exploring our intuitions about the location of the self. To our knowledge, the only study that has directly examined this question was done by a group of Italian researchers, who guided adult participants through a lengthy semistructured interview designed to generate a verbal report of their phenomenological experience of the location of the self.⁴ Not only were people perfectly able to make sense of the idea of their self being “located” in a particular spot within the body, they also found it relatively easy to

indicate a precise location, and their answers were highly consensual. The vast majority of participants indicated a precise point inside the head, midway behind the eyes, as the location for what the researchers called the “I-that-perceives.”

Furthermore, the researchers also recruited eight subjects who were blind—some from birth, and some who became blind later in life. These subjects showed the same pattern of responses as the sighted subjects, suggesting that the experience of the self as being in the head, near the eyes, is not entirely related to vision.

What can we conclude from these findings? It seems that when asked directly, people have no problem asserting that their conscious self is located inside their head. However, it is highly likely that these adult subjects were aware of the common contemporary idea that the brain is responsible for producing all mental states. As such, it is possible that despite being instructed to focus on their phenomenal experiences, these participants were simply using their culturally acquired knowledge of the brain as the source of mental life to guide their responses. The overwhelming concurrence of the blind subjects may actually provide additional evidence that this is the case, as blind subjects obviously have different phenomenal experiences than sighted subjects, but probably have the same cultural knowledge.

We were interested in whether, aside from this cultural knowledge, there is an intuitive sense of the self as being located in a particular spot in the body. One way of getting at these intuitions is to look at preschool-aged children, who have little understanding of the brain as the producer of mental states.⁵

There is some indirect evidence to suggest that, in fact, children at this age do have intuitions about the location of the self. In a 1980 study investigating children’s egocentrism, Flavell *et al.*⁶ found that when 2.5- to 4-year-old children had their eyes covered, they judged that an experimenter could not see them. However, they acknowledged that the experimenter could see their arm, despite the fact that the child themselves could not, suggesting that they were capable of taking the experimenter’s perspective at least some of the time.

In a related study, McGuigan and Doherty⁷ found that 2- and 3-year-old children claimed that they could see a doll if its legs were occluded, but that they could not see the doll if its head was occluded.

The researchers interpreted this curious pattern of results as suggesting that children between the ages of about 2 and 4 may have a different notion than adults of what it means to “see” a person. McGuigan and Doherty⁷ suggest that children may misconstrue the concept of “seeing” a human target as an activity that requires mutual engagement.

But there is another interpretation, first proposed in this journal by Neisser.⁸ Perhaps children intuitively see the head or the eyes as the “location” of the individual and intend the claim that the experimenter “can’t see *me*” to mean the experimenter “can’t see *my self*.” This hypothesis predicts that children would also claim that they could not see another person when that person’s eyes were covered. A later study by McGuigan⁹ finds exactly this result: 2- and 3-year-old children claimed that when a doll was blindfolded, another doll could not see it.

We are currently conducting three experiments to further investigate the hypothesis that humans have a natural inclination to think of the head, and perhaps the eyes, as the location of the self.¹⁰ These experiments use two different implicit methods to probe the intuitions of 4- and 5-year-old children, as well as undergraduate adults. Both of these methods take advantage of the idea that we understand the referent of proper names such as “Sally” to be the person’s self, which may correspond with some, all, or none of her physical body.

In one study we show 4- and 5-year-old children, and a group of Yale undergraduates, a stick-figure drawing of a girl named Sally, and ask them to erase as much of the drawing as possible while still leaving Sally in the picture. Both children and adults tend to erase the elements of Sally’s lower body before those of her head. Children are equally likely to leave all the parts of Sally’s head in the picture, while adults more often leave Sally’s eyes in the picture than her mouth.

In another study, we introduce children and adults to a cartoon character who has a fly positioned on her body in different locations and ask them to judge when the fly was closer to her. Both children and adults judge the fly to be closest to the character when it is near her eyes. In a follow-up experiment, participants make the same judgments about an alien character whose eyes are located on his chest. Again, both adults and children think that the fly closest to the alien’s eyes is the closest to the

alien. This suggests that both adults and children have a strong sense that the self is located near the eyes, even when the eyes are not located in the head. Together, these three studies provide converging evidence that children and adults intuitively think of a person as being located close to the eyes, and lend support to the idea that we think of the self as occupying a physical location within the body.

The indirect nature of the methods used in these experiments suggest that these judgments do not result from a culturally learned understanding of the role of the brain in producing mental states, or of the location of the self. Participants were asked to make judgments about distance, and about the minimally essential parts of a person when depicted in a drawing. Neither of these questions should, *a priori*, cause participants to consciously reflect on the location of the self, or the nature of the brain, and yet, a robust agreement among participants aligns with findings from previous research to suggest that there is a commonly experienced sense of the self as being located near the eyes.

If participants consider the self to be equally distributed across the body, or if they think of the self as an abstract idea with no spatial location, then they should judge that an object is equally close to the person no matter where on the body it is positioned. However, participants in our study judged a fly to be closer to Mary when it was near her eyes rather than her feet. Thus we suggest that participants were using the name of the person as presented in the questions (“try your best to leave *Sally* in the picture”; “Which fly is closer to *Mary*?”) as standing for *Sally*’s/*Mary*’s *self*, and that this self is seen as residing near the eyes.

While several questions yet remain about the precise nature of our intuitions about the location of the self, these studies illuminate a previously unknown intuitive bias to see the self as located near the eyes, and provide a useful method for further investigations into our intuitive conception of the self and its properties and capabilities.

Conflicts of interest

The authors declare no conflicts of interest.

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