14. The Self, Life, & Death (2025)

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In Essay 10, I listed many reasons why religion can be bad for humans. Yet, every human culture that we know of has some form of religion. Are proponents of religion on to something? In this essay, I will argue that they are, but it is not what they think. First, some background.

The Self

Research in the last half century delineating the functions of different parts of the human brain has recently identified where the human **sense of self** is located. It appears to be concentrated in the parietal lobes of the cerebral cortex (Cavanna & Trimble, 2006) and particularly the right lobe (Cohen & Johnstone, 2024). The parietal lobes integrate inputs from all sensory processing centers to characterize the current state and location of that individual. The *precuneus*, a core area in these lobes, amalgamates this status information with autobiographical memories into a general sense of self. After damage to their right precuneus, people are no longer able to recognize a photo of themselves or whether a given limb is theirs or not. However, they can still recognize photos of other people or other people's body parts. Identification of others and recall of memories about others' experiences are handled in other parts of the brain. The right precuneus, in contrast, seems fanatically committed to the self!

The precuneus also appears to be the core center controlling our attention, oversight of technical skills such as making tools, and our analytical and deductive reasoning, including generating hypotheses (Lombard & Högberg, 2021). It also appears to be the location of the "default mode network" (DMN) which takes over our consciousness when we are not doing anything. This is where we daydream, imagine possible scenarios for future actions, feel guilty for past actions we should've avoided, etc. It should not be surprising that the precuneus has the highest metabolic rate of any part of the cerebral cortex and has a correspondingly dense blood supply to keep the underlying tissues cool.

The current enlargement of the parietal lobes in *Homo sapiens'* brains is a fairly late development: until 150,000 years ago, those lobes had similar proportions as those in Neanderthals and earlier hominins (Bruner, 2018,2021). The subsequent disproportionate enlargement of the parietal lobes in our species coincides historically with major shifts in human hunting practices and social organization. This makes sense, given what we now know to be the functions of these lobes.

Human children are not born with enlarged parietal lobes. Instead, these expand with growth until 18-24 months of age. That is when children first exhibit a sense of self, now being able to recognize themselves in the mirror and soon discriminating between what is "mine" and what is "theirs" (Cohen & Johnstone 2024).

Self and the Theory of Mind

The human sense of self has turned out to be an incredible tool. Given our autobiographical memories, we can almost step out of our own bodies mentally and see ourselves as agents in the surrounding society and ecology. Because we know what motivated us to perform some act in the past, it is not a big step to assume that other people have similar brains, and when they do something, they do it for the same reasons we did. This ability to use ourselves as a model to explain the behaviors and likely intentions of others is called a "theory of mind" (Hapé 2003). The word "theory" is used because we cannot know for sure what they are thinking, so at best we have a theory. All of us rely on this tool many times every day in our social interactions with others. This was likely an important adaptation in promoting cooperative behavior in early human societies. Taking it one step further, an early hunter might have a theory of mind about the antelope he is hunting. This could easily help him capture his prey. We tend to take our theories of mind for granted, but they clearly made a big difference in our recent evolution.

And there is another advantage. While we can use our theory of mind to outsmart an opponent or prey, we might also use it to guess the needs or desires of a person we care about and do something beneficial for them. This is called **empathy** and is one way to promote social coherence. One might have thought that to feel empathetic for someone, we would have to "tune down" our precuneus's obsession with our self. It turns out that the opposite is true: studies have shown that the precuneus exhibits enhanced activity when people are thinking or doing empathetic things (Johnstone & Cohen 2019). The ability to be empathetic could easily have been highly adaptive as early humans began to live in larger and more integrated groups.

The precuneus is the apparent arbiter of whether we act selfishly or altruistically. The fact that the same part of the brain can switch our social trajectories in either direction certainly explains how young children can be selfish to a companion one day and generous the next. It might also explain how easily human societies can switch between cooperative and selfish versions as discussed in Essay 11.

The Self and Religion

It turns out that the mechanisms creating our sense of self also generate, as a side effect, an increased predilection to accept religious concepts. There are two components to this:

1) *A Conscious Fear of Death*: By 3 years of age, human children have accepted that their "self" is a key part of who they are: they presume that this has always been so and will continue to be forever (Rochat 2010). Then, jovial Uncle Ed dies. The family dog gets run over by a car. Given their theory of mind, the observant children suddenly realize this could also happen to them. While both animals and people are hardwired to avoid being killed, only humans, as far as we know, can imagine the whole gory sequence in great detail! And when they do, they cannot help but wonder what would happen to their self. Until the conscious recognition of death, children assume their self will be eternal. But what if it is not? For most people, and especially children, this can be a terrifying question.

It does not take much creativity to surmise that one's self might be materially different from the body. It consists of thoughts and feelings and memories, not an observable structure like a finger or a nose. What if the self is actually some non-material essence, call it a "spirit" or "soul", that enters your body before you are born and separates from it when your body dies? This would solve the paradox!

But it generates a new question: where do human souls go when their bodies die? Well, in for an inch, in for a mile: if we accept that the self is immaterial, so might be the place where souls go after death of their bodies. Heaven and Hell are easy concepts once you accept immaterial souls. And then there is another option, reincarnation: maybe when a soul leaves one dead body, it soon goes into the infant body of another. There are other scenarios, but you get the point.

Accepting these proposals can be very comforting. Many people will adopt them without further evidence. But others may be skeptical. Wouldn't it be nice if there were some evidence that the soul *is* immaterial and *can* separate from the body? We take up this possibility next.

2) *Transcendent Experiences*: Throughout recorded history, people have been having transcendent experiences (Johnstone & Cohen 2019; Cohen & Johnstone 2024). A common form is an "out of body experience" in which a person suddenly finds themself looking down from a height at their own body, but otherwise having no sensation of it. This is often interpreted as evidence that the human soul is independent of the human physical body.

In other cases of perceived transcendence, one's own body isn't visible, but again there is no sensory input from it. It is as if one has left the body and merged with the universe. This experience is usually accompanied by a powerful sense of happiness and pleasure. It is often interpreted afterwards as having provided the person with a connection to some greater truth, although the specification of that truth is usually provided *after* the experience.

Transcendent experiences in healthy people are most often triggered by the ingestion of some drug (usually a toxin created by a plant to discourage herbivory), practiced meditation designed to suppress the sense of self, or both. Some people with damaged brains become more likely to have such experiences, and people who were physiologically close to death, but survived, often report them. There also appears to be a genetic component, and thus some people and their relatives are more likely to have transcendent experiences (Cohen & Johnstone 2024; Johnstone & Cohen 2019).

Recent studies using tools that can monitor which parts of the brain are active when its owner is engaged in certain kinds of mental activities have identified the right precuneus as the most likely seat of transcendent experiences. Significantly, these experiences correlate with major *decreases* in neural activity in this region (Cohen & Johnstone 2024). Another tool, trans magnetic stimulation, has been used to suppress neural activity in the right precuneus and this can trigger transcendent experiences (Blanke & Metzinger 2009). Other studies have shown that the euphoria often felt during transcendent experiences is due to the concurrent release of oxytocin and dopamine (Johnstone & Cohen 2019). These authors note that because these hormones are released when a mother suckles her child or a couple have satisfying sex, they promote bonding. They suggest this is why people experiencing transcendent experiences feel they are bonding with the universe.

Reduced precuneus activity during transcendent experiences makes sense because without continuous sensory input, the precuneus cannot update the current sense of self. This generates a feeling of selflessness, which not surprisingly is cited as a major goal of meditation. Without the dominant intrusion of the self, the transcendent person is only conscious of recent or imagined external contexts. And the relevance of these contexts to one's self is absent: the contexts seem to

be there in their own right.

It thus appears that both a conscious fear of death and transcendent experiences are side effects of the mechanisms by which our brains generate our sense of self. It is the latter that enables us to use the theory of mind to envision ourselves dying. And when the normal mechanisms are impeded by drugs, damage, or meditation, the sensory inputs required for a conscious sense of self are impeded, and we are left with a remaining consciousness, detached from our bodies.

Artifact or adaptation?

So, are the "cosmic truths" supposedly revealed during out of body and transcendent experiences simply artifacts of a dysfunctional precuneus? Given that I know of no scientific evidence for souls, Heaven and Hell, or reincarnation, this conclusion would undermine the one remaining "fact" to support most religious beliefs. It is not easy to convince people who have had these experiences that they are illusions; when they have them, they feel it is so right and convincing.

Even here, there is room for skepticism. As noted, oxytocin and dopamine are largely responsible for the feelings of love and bonding that we feel after having sex with someone we care about. It makes us feel that this love is true and eternal. But by the time you get to my age, you have learned that this post-coital euphoria can be misleading and is no guarantee of some "cosmic truth" of eternal love. So, I confess, I am equally skeptical of transcendental euphoria as a guarantor of cosmic truth.

OK, JJ: *you* may be skeptical, but then why is religion so prevalent in human societies? Robin Dunbar (2020) has argued that religion in early human societies was critical to promoting cohesion and cooperation. Given that the precuneus can switch so easily between selfish and empathetic strategies, I could see that making charity, for example, a key condition for later admission to Heaven, could easily promote social cooperation. So even if the religion were justified on the basis of brain dysfunction, it still might be evolutionarily adaptive.

And on the darker side, consider how many times in history that religion has supported and justified selfish and hierarchical societies. Religious leaders in the south of the United States cited all kinds of biblical justifications for the enslavement of Black people. I listed in Essay 10 many other ways in which religion has supported the exploitation of subordinate people by dominant ones. This may have been detrimental to the exploited people, but it definitely increased the evolutionary fitness of the dominants.

While the precuneus's side effects likely have little influence on the evolutionary trajectory of a religion, they fulfill the necessary condition that enough people believe in that religion. Were they absent, either some other evidence of the supernatural would be required, or the religion would have to be forced on the population. In any case, they *are* there and religions are flourishing.

The Future

As I write this, we are deluged daily with new advances in the field of artificial intelligence. We can now ask Google a question and instantly get an answer based on the software having summarized 400 articles. Personal assistant software and robots are improving their capabilities

at an incredible pace. So, one cannot help but wonder what will happen when the AI engineers develop a computer or robot with a conscious sense of self (Butlin et al. 2023; Tait et al, 2023). Will it have a theory of mind and if so, what happens if it realizes it might be mortal? Might we end up having to deal with a bunch of robotic religious zealots? Science fiction writers have already explored possibilities for computers and robots taking over and getting rid of humans. I always thought that was pretty amusing, but now I am not so sure....

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