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SPIRITUALLY WIRED: THE SCIENCE OF THE MIND AND THE RATIONALITY OF BELIEF/UNBELIEF

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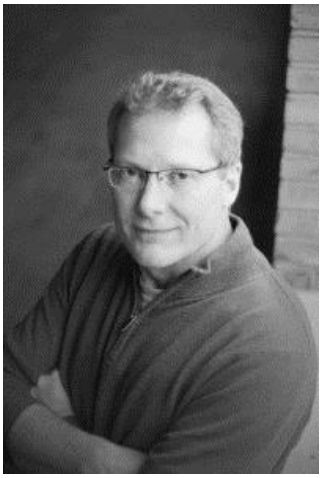

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Resumo

Neste artigo, examino uma sequência de argumentos de base psicológica que visam minar a crença religiosa racional. Defendo que esses argumentos, do "capacete de Deus" ao gene de Deus, exageram quanto aos indícios disponíveis e não conseguem fundamentar suas conclusões. Além disso, o que há de ciência cognitiva da religião mais bem fundamentada em termos empíricos, embora ainda em sua infância, é neutra com respeito à racionalidade da crença religiosa. Concluo com uma discussão dos impulsos cognitivos para a descrença e defendo que, por analogia, deveríamos evitar (epistemicamente) julgamentos acerca da racionalidade da crença ou descrença religiosa.

Palavras-Chave: Gene de Deus. Capacete de Deus. Faculdade de Deus. Ciência cognitiva da religião. Experiência de quase morte. Ateísmo. Autismo. Racionalidade da crença em Deus. Racionalidade.

Abstract

I canvass a suite of psychologically-based arguments which aim to undermine rational religious belief. I argue that such arguments, from the God helmet to the God gene, overstate the evidence and fail to establish their conclusions. Moreover, the empirically better-supported cognitive science of religion, though in its infancy, is neutral with respect to the rationality of religious belief. I conclude with a discussion of the cognitive impulses to unbelief and argue, by analogy, that we should (epistemically) refrain from judgments of the rationality of religious belief or unbelief.

Keywords: God gene. God helmet. God faculty. Cognitive science of religion. Near-death experience. Atheism. Autism. Rationality of religious belief. Rationality.

1 YOU JUST BELIEVE THAT BECAUSE

As a first-year university student I had a humanities professor who dismissed the truth of Christianity, which he claimed was invented whole cloth by St. Paul, in a single, sneering, unsubstantiated anecdotal diagnosis. St. Paul, then known as Saul of Tarsus, converted to Christianity while on a mission to hunt down and then imprison or even kill the first Christians; indeed, Saul witnessed and approved of the stoning of St. Stephen. On his way to Damascus, Saul, "still breathing out murderous threats against the Lord's disciples," was surrounded by a sudden and brilliant flash of light that knocked him to the ground. Then he heard a majestic voice say, "Saul, Saul, why do you persecute me?" When Saul asks the divine voice to identify himself, he hears this reply, "I am Jesus." In a single ecstatic vision, Saul "sees" and hears God, understands that Jesus is God, and learns that Jesus' disciples are God's people (body). In 2 Corinthians 12:4, perhaps reflecting on this vision, Paul reports that he "was caught up to paradise and heard inexpressible things." One explanation of Paul's ecstatic experiences is that God himself overwhelmed him in spirit and truth. Another explanation, the one offered by my first-year humanities professor, was that Paul, who admitted to having a painful thorn in the flesh, was suffering from temporal lobe epilepsy (TLE); St. Paul's "visions" were nothing but neural misfirings commonly experienced when undergoing an epileptic seizure. St. Paul just believed that Jesus was God in the flesh because of a complex partial seizure of his temporal lobe.

My professor relied on an easy but dubious way to win an argument: play the "You just believe that because…" card. Consider some examples. "You just believe in raising taxes [in spite of the evidence that wealth redistribution is ineffective] because you're a Socialist." "You just believe that your feelings are important [as opposed to the really good reasons I just gave you] because you're a woman." "You just believe that the earth is only 10,000 years old [in opposition to compelling science] because you're a fundamentalist." By showing the (nonrational or psychological) causes of one's belief (you believe that *because*), you think you've undermined or diminished the rationality of the person holding the belief. You condescendingly claimed that your opponent (or friend or even wife, for that matter) rejects obvious evidence because their ideology or gender or religion made them do it. *They* are irrational, you triumphantly imply, their belief caused by psychological impulses. *You*, on the other hand, are coolly rational,

basing your belief on a sober assessment of the compelling evidence. You think to yourself that by revealing their psychological impulses to believe (instead of your rational way), you've shown them to be irrational. You declare yourself the winner.

There are a lot of "You just believe that because…" claims in areas related to God and the mind. Most famously, Freud argued that religion is a psychologically infantile form of wish-fulfillment: in the face of an uncaring cosmos we feel helpless and guilty and so invent a father-like god who grants us security and forgiveness. Freud, in paraphrase, 'You just believe in God because you have not grown up and faced reality without your psychological crutch.' Contemporary Yale psychologist Paul Bloom offers an explanation of belief in gods based on malfunctioning psychological systems; he goes on to claim that religion is "an incidental by-product of cognitive functioning gone awry" (Bloom, 2005). Biologist Richard Dawkins similarly argues that "the irrationality of religion is a by-product of a particular built-in irrationality mechanism in the brain" (Dawkins, 2006). You can hear Bloom and Dawkins saying, "You just believe in God because of a malfunctioning cognitive faculty."

We will soon examine the claim that God is nothing but a brain spasm because religious experiences are simply neural processes in the brain. "You just believe in God because the neurons in your brain's temporal lobe were overstimulated." And a claim based on the so-called God gene, which alleges that some humans are, and others are not, genetically disposed to spiritual beliefs. 'You just believe in God because your genes predisposed you to do so.' Uncover the neurological, psychological or genetic substrata of a belief and you've thereby undermined it.

When we separate out some of the hysterical chaff, we can focus on the well-established cognitive science wheat. And then we can ask if that wheat, properly understood, undermines rational religious belief.

2 PROOF OF HEAVEN

Let's start with a quick look at dismissals of near death experiences (in which possibly brain-dead individuals claim to have experiences of God): 'You just believe that because your stressed-out nearly dead brain was awash in chemicals.'

In 2008, rare and deadly bacteria began feasting on the brain of Harvard neurosurgeon, Eben Alexander. While he valiantly resisted the hidden invaders, slowly but surely the bacteria proved overwhelming. Alexander's brain eventually succumbed, and he slipped into a deep coma. For seven days he was constantly monitored by his physicians, who clinically documented his decline: his neocortex, the part of the brain that makes us human, had completely shut down. His rector and friend, Rev. Michael R. Sullivan, was called to his side, prepared to read him his last rites. Just as Alexander's doctors were on the verge of shutting off his life support system, he sprang back to consciousness.

Before entering the hospital, Alexander did not believe in God; "No scientific proof," he said. When Alexander woke up from the coma he was a convinced believer in God and the afterlife.

His account was published in a cover story in *Newsweek.* During his coma, while his brain was turned off, Alexander's consciousness left his body, or so he claimed, and traveled into an inexplicably beautiful world guided by a startlingly beautiful woman. His consciousness, freed from his brain, wandered freely through a muddy darkness and into an embracing light. Here is what he experienced:

> Toward the beginning of my adventure, I was in a place of clouds. Big, puffy, pink-white ones that showed up sharply against the deep blue-black sky.
>
> Higher than the clouds — immeasurably higher — flocks of transparent, shimmering beings arced across the sky, leaving long, streamerlike lines behind them.
>
> Birds? Angels? These words registered later, when I was writing down my recollections. But neither of these words do justice to the beings themselves, which were quite simply different from anything I have known on this planet. They were more advanced. Higher forms.
>
> A sound, huge and booming like a glorious chant, came down from above, and I wondered if the winged beings were producing it. Again, thinking about it later, it occurred to me that the joy of these creatures, as they soared along, was such that they had to make this noise — that if the joy didn't come out of them this way then they would simply not otherwise be able to contain it. The sound was palpable and almost material, like a rain that you can feel on your skin but doesn't get you wet.
>
> Seeing and hearing were not separate in this place where I now was. I could hear the visual beauty of the silvery bodies of those scintillating beings above, and I could see the surging, joyful perfection of what they sang (all quotes and reference are to Alexander, 2012).

At the end of his journey, his lovely guide spoke to him without sound and without words. She said, "You are loved, deeply cherished, forever. There is nothing you have to fear. You will always be loved, and there's nothing that you can do wrong."

Finally she told him that he had to return to this world, to this life. And then he woke up.

Alexander had the richest most real experience of his life at precisely that time when the part of his brain involved in consciousness, thought, memory and emotion was completely turned off. His deepest thoughts and most profound emotions, which would coalesce into his deepest memory, occurred without the support of his brain. He journeyed in brain-free consciousness into a newer, larger, better world and, so he claims, experienced God's love face-to-face.

Prior to his own experiences of the next world, he had always poo-pooed claims of out-of-body experiences, believing them to be completely scientifically explicable—perhaps near death the brain is flooded with neurochemicals which indelibly produce these remarkable sensations.

But, Alexander wondered, how could he have had such experiences when the neural superstructure of such experiences had completely collapsed? He didn't have a *place* within his body to produce such experiences.

And so Alexander came to believe, was forced, really, by his experience to believe, in the eternity of our souls, that there is a bigger and better and longer life after this life, and that God is waiting to embrace us.

After interviewing Alexander, Oprah Winfrey exclaimed, "I just talked to the man who saw God."

There were, of course, the predictable skeptical and sarcastic responses to Alexander's alleged proof of heaven. Max Read, editor and blogger, says that this is "possibly the most embarrassing cover story *Newsweek* has ever run." He proceeded to deconstruct, line by line, Alexander's account of Heaven by comparing it with first-

hand accounts of tripping on LSD or mushrooms.[1] Sam Harris, famed atheist, writes: "Alexander's account is so bad—his reasoning so lazy and tendentious—that it would be beneath notice if not for the fact that it currently disgraces the cover of a major newsmagazine." Alexander's conversion, he mocks, "required a ride on a psychedelic butterfly."[2] Oliver Sacks, professor of neurology and renowned author, joined the skeptics.[3] Such out-of-body experiences, he argues, are illusions that prey on precisely the same portions of the brain that process and store very real experiences—they seem real because they occur in the real experience portion of the brain and are stored in the real memory portion of the brain. Such illusions, then, have the inescapable feel of reality; such memories of a spirit world are indistinguishable from the memories of a long ago trip to Disneyworld. Alexander's illusions were nothing more than neurological events in his poorly functioning brain.

The pre-coma Alexander may have written something similar.

3 NEAR-DEATH EXPERIENCES

So-called near-death experiences (NDE) have occurred around the world and throughout human history. Alexander's account fits a standard pattern that typically includes reports of pure bright light, floating out of one's body, and a journey often through a tunnel into another dimension (usually, but not always, Heaven). Along the way, one often meets spiritual beings who guide one into the next world and, after conducting a review of one's entire life and then securing one's forgiveness, guide one back again into one's body. NDEs seem more real than this-worldly experiences; our world is but a faint shadow of this bigger, better, more substantial, "realer than real," world to come. The colors and flavors and feels of the afterworld are vastly more vivid and powerful and enticing than those in one's relatively flat and dingy and bland earthly life. And so one returns to one's body in the mundane world only very reluctantly, often with a sense of duty after having been instructed to return and tell what they had seen and heard and felt—Heaven, usually, and God and love.

1 Max Read, "*Newsweek* Cover Story or Internet Posting About Drugs? A Quiz," *Gawker*, October 8, 2012, gawker.com/5949892/newsweek-cover-story-or-internet-posting-about-dugs-a-quiz.
2 Sam Harris, "This Must Be Heaven," *The Blog*, October 12, 2012,www.samharris.org/blog/item/this-must-be-heaven.
3 Oliver Sacks, "Seeing God in the Third Millennium," *The Atlantic*, Dec. 12, 2012.

The standard skeptical account of Alexander-like near-death experiences holds that such vivid NDEs are the last gasps of a dying brain on earth, not the first gasps of a new life in heaven. That sense of peace and tranquility, the sensation of passing through a tunnel toward the light, and the feelings of warmth and even of being unconditionally loved are, so this account goes, nothing more than the afterglow of a super-stimulated brain awash in chemicals. Due to the stress of dying, the brain goes into hyper mode – with neurons prodigiously firing and chemicals releasing everywhere. Loss of blood flow to the brain might narrow visual sensations, thus explaining the "perceptions" of a tunnel. The brain is bathed in endorphins, the body's naturally produced morphine, creating a euphoric high.

NDEs prompted a recent study which examined the EEGs of rats which had been forced into cardiac arrest. For the first thirty seconds after "death" the EEGs showed "a transient and global surge of synchronized gamma oscillations, which display high levels of interregional coherence and feedback connectivity as well as cross-frequency coupling with both theta and alpha waves," which, translated into lay-speak means that a whole lotta stuff, hyper-consciousness, was going on inside those little but "highly aroused" rat brains. Did the EEGs record the brain activity of those little vermin as they excitedly crossed over into the mammalian promised land, forgiven finally for spreading the plague and being disproportionately terrifying to human beings? Or did they show, once and for all, that while NDEs may seem realer than real, they are nothing but doped-up illusions? Did the rat experiments induce a rat high or did they convey their subjects to the basement of rat heaven? The experimenters' sober conclusion: "By presenting evidence of highly organized brain activity and neurophysiologic features consistent with conscious processing at near-death, we now provide a scientific framework to begin to explain the highly lucid and realer-than-real mental experiences reported by near-death survivors."[4] Again, translated into layspeak: "We don't have any idea what the rats were thinking, sensing, or feeling during their NDEs or how their NDEs relate to human NDEs (how could we, really?) but, WOW, maybe we can begin to explain away the illusory experience of survivors of NDEs." Or

[4]Borjigin, Jimo et al. "Surge of Neurophysiological Coherence and Connectivity in the Dying Brain." *Proceedings of the National Academy of Sciences of the United States of America* 110.35 (2013): 14432–14437. *PMC*. Web. 10 Aug. 2015.

something like that.

Alexander and other survivors of NDEs need not deny the transient and global surge of synchronized gamma oscillations. If the mind/brain is involved in cognizing the NDE, which is by all accounts mind-blowingly awesome and life transforming, one might expect EEG readings that are off the charts. If a person were, for the first time, having to wrap her ordinary mind around an extraordinary Reality, one that is realer than real, neuroscientists might see "high levels of interregional coherence and feedback connectivity" as well as "cross-frequency coupling with both theta and alpha waves" (heck, maybe a few other waves, as well). Given that we think the world with our mind/brains, any human experience would be mediated by mind. So, if one did cross over to the other, awesome side, the brain would be in frantic overdrive trying to grasp it.

Are NDEs proof of heaven, as Alexander claims, or are they all in the mind, as his detractors claim? Did Alexander touch the Really real or was it, as Sacks claims, a profound hallucination? These questions raise this important issue: are our god beliefs merely brain events or do they, at least in certain circumstances for some people, put us in touch with a Reality outside of our minds?

4 THE GOD HELMET

Near-death is not the only way people have experiences of God; there are other, considerably less dangerous options. Consider the so-called "God Helmet" developed by neuroscientist, Michael Persinger. A pilgrimage to Persinger's laboratory at Canada's Laurentian University might culminate in a vision of God. The God helmet, so it is claimed, artificially induces an experience of God by electromagnetically stimulating the brain (with no known involvement on the part of the Almighty). Persinger alleges that the God helmet shows that all claims to have experienced God are nothing but the effects of electromagnetic stimulations in the brain. "God" is nothing but the result of transient electrical massages of the brain. As Persinger puts it, "Instead of God creating our brains, our brains created God."

In Persinger's laboratory, white-coated technicians escort each subject through a massive steel door and into a sterile acoustic chamber. They are seated in a comfortable

chair and then told they are participating in a relaxation study. The technicians snugly fit a motorcycle helmet, outfitted with electromagnetic solenoids, on their heads. The techies exit, leaving the subject sealed alone in a completely silent, completely dark chamber. Electricity begins flowing into the helmet's four magnetic coils on each side of the head, passing through the electrodes attached to the subject's temples and into their temporal lobes, electro-massaging a small portion of the subject's brain.

The scientists monitor and record brain waves, but the good stuff is reserved for the subject. When the subject's temporal lobes are electromagnetically stimulated, they report various spiritual experiences including sensing the felt presence of God (or other spiritual beings such as angels, ancestors and ghosts); up to about 80% of Persinger's subjects reported a "felt presence." Some report feeling a sense of cosmic harmony or oneness. Has Persinger identified, isolated and stimulated the neural "God spot," that part of the brain that creates *ex nihilo* God beliefs?

You can purchase your own commercially produced God Helmet online for just $145 plus $5 shipping (USA); you can even download plans and make your own God Helmet. With the God Helmet one gets the goods—inner peace, tranquility and a sense of harmony--but without religion's costly rituals such as rising early for and wasting time at dull worship services, expensive tithing, tedious prayer, and demanding fasting (not to mention, among many other extreme rituals, massive scarification, fire walking, multiple skin piercings, teeth chiseling, and flagellation). One gets God, so to speak, without all that religious baggage.

Yet maybe not. The God Helmet does not work for everyone and maybe even for no one. While Persinger claims it worked for 80% of his subjects, a Swedish lab was unable to replicate his results.[5] The lead scientist, Pehr Granqvist of Uppsala University, attributed Persinger's astonishing "success rate" to suggestibility and in two ways. First, he claimed that either Persinger or his technicians created in certain suggestible subjects an expectation of a spiritual experience (suggestibility is part and parcel of our native desire to please—manifested in our unconscious eagerness to perform as expected). Second, Granqvist claimed that Persinger's leading questions elicited hoped-for responses concerning felt presences. In Granqvist's lab double-blind ruled the day:

[5]Granqvist P., *et al*. *Neurosci. Lett.*, published online doi:10.1016/j.neulet.2004.10.057 (2004).

neither his subjects nor the technicians who worked with them were aware of the purpose of the study; the subjects could not have been susceptible to and the technicians could not have provided subtle clues of the study's purposes. The Granqvist study showed no appreciable spiritual effects for participants who were electromagnetically stimulated. Astonishingly, fully half of the subjects in Granqvist's control group (this group wore a God Helmet but received no electromagnetic stimulation whatsoever) reported strong religious experiences! Finally, Granqvist argued that the electromagnetic fields involved in Persinger's experiments, with magnetic fields weaker than those of a refrigerator magnet, were too weak to have any meaningful effect on the brain.

Granqvist's study has led to rounds of increasingly strident responses. Persinger insisted on his scientific bona fides ("It was, too, double blind"), claiming that Granqvist did not set up his experiment properly. Granqvist and his team demurred. We'll leave it at that.

Suppose, for the sake of discussion, Persinger is right and Granqvist is wrong: the God Helmet works.

Setting aside problems of replication and suggestibility, Persinger's results are less sensational and stunning than one might expect. While 80% felt a personal presence in the room (recall, gods, ghosts, ancestors, other people, etc.), did anyone really "see" God? Psychologist Susan Blackmore reported a decidedly different profound and positive God Helmet experience; she wrote that it was one of "the most extraordinary experiences I have ever had." But a profound, positive and even extraordinary experience is not the Beatific vision. In fact, only about 1% of those involved in Persinger's studies claim to have felt the presence of god. One might expect more than 1% to randomly feel the presence of God simply by sitting in a soundless, pitch black room while participating in a relaxation study (or even to feel a "sensed presence").

Finally, suppose that Persinger has actually succeeded in occasionally inducing visions of God through the electromagnetic stimulation of the brain. Should that undermine rational belief in God?

Given that we are embodied creatures, ones for whom thinking is mediated by

brains, we should not be surprised to learn that the brain is deeply implicated in every sort of belief, including god beliefs. Moreover, religious believers with a strong sense of creation should willingly concede the goodness of the body and, thus, of embodied cognition (which holds that we think with our whole bodies (part of which is the brain)). We are not ghost-like spirits who float above physical reality forming beliefs without the (usually believed to be corrupting or distorting) influences of the body. As creatures of the dust, we are part and parcel of the physical world, and so process our experiences through our very physical brains; we may be more than brains but we have brains and our very human, creaturely cognition is deeply tied to our brain's neural processes. As with, say, perceptual or memory beliefs, particular portions of that brain are much more likely than others to be implicated in or to mediate god beliefs. Perhaps under very special circumstances those portions of the brain, if stimulated appropriately, can even generate god beliefs.

Most of our embodied neural processors are involved in very ordinary cognitions. Consider those involved in perceptual cognition. When I look at a tree and form the belief, "There's a tree before me," I do so partly because some portion(s) of the brain are involved in perception (and partly because there is a tree out there, which I see). That's how ordinary perception works—when I see a tree (a real tree, out there, outside of my mind), it causes visual information to pass through my eyes through my retinal nerves into the visual portion of my brain, which induces various chemical and neural processes, which in turn generate a sensation of a tree and an accompanying tree belief. Of course, we know very little about how all of this works. But we do know that the perception of a tree involves trees, eyes, nerves, the brain, chemicals, neurons and neural processes, inner sensations and beliefs.

Perhaps one day a clever neuroscientist will succeed in electromagnetically inducing in the perceptual portion of my brain, without my seeing a tree, a very real visual sensation of a tree. If so, I'd find myself believing (wrongly), "There's a tree before me."

Should this electromagnetic creation of a perceptual sensation and corresponding belief undermine the rationality of all of my perceptual beliefs?

I think it's clear that on this particular occasion my perceptual belief, "there's a

tree before me," is not rational because it was produced by the direct electromagnetic stimulation of my brain (and not by seeing a tree). The neuroscientist and I would have a good laugh together with me marveling that a machine could so effectively and powerfully reproduce the sensations that I have when I actually perceive something. And I will understand somewhat better the fact that my perceptual encounters with the outside world electromagnetically stimulate portions of my brain in ways that produce inner sensations and even beliefs.

Should I also conclude, from that one electromagnetically induced illusion, that all of my perceptual beliefs are illusory?

I think not. While I might be surprised that under very special laboratory circumstances perceptual sensations and beliefs can be induced in me without instigation from the physical world (say, a tree or a dog), I shouldn't think that this entails that all of my perceptual beliefs have been induced in me without instigation from the physical world. Why would I think that? Why suppose that I should stop trusting my perceptual faculties?

Likewise, I won't stop trusting my memory faculty even if a clever neuroscientist should successfully induce in me a memory, or my moral faculty even if a neuroscientist should successfully induce in me a moral belief. And I won't stop believing that my wife loves me even if a clever neuroscientist should induce in me both a very real sense of other persons or of being loved. And it shouldn't trouble me if I were to find out that clever neuroscientists had done any of that in other persons, even if done in lots of them.

How might such neuroscientific findings undermine rational god beliefs? Not through the discovery that in very unusual circumstances, those involving the direct stimulation of a person's brain, one can induce god beliefs. Of course, a god belief produced in that very unnatural way, without any outside connection to the external reality it affirms, would not be rational. But then neither would thusly produce tree or memory beliefs. Consider the tree belief: if I know that my tree belief was produced directly through the electromagnetic stimulation of my brain (thus not by seeing a tree), then that belief is irrational. That particular tree belief is rationally undermined by my awareness that it was directly caused by the helmet and not by seeing a tree. Likewise, if

I know that my god belief was electromagnetically induced without any reliable connection to a god, then *that* belief is irrational. *That* particular god belief is rationally undermined by my awareness that it was caused by a helmet and not by god.

But does that undermine *every* tree or god belief? Why should such a unique laboratory experience undermine the rationality of them? What about my prior God beliefs? And what about everyone else's god beliefs? Would my and a few others' electromagnetically induced beliefs undermine them with respect to their god beliefs?[6]

To undermine the rationality of all religious believers, we'd need some reason to think that most religious beliefs were produced by something like direct electromagnetic stimulations of the brain (not, ultimately, caused by God). Maybe they are—perhaps regular shifts in the earth's tectonic plates have caused electromagnetic eruptions sufficient to induce in large numbers of people various god beliefs throughout most of the world and through human history. Maybe atheism is on the recent rise because the earth's crust has sufficiently stabilized so that it emits fewer electromagnetic stimulations to the god part of the brain.

"Perhaps" and "maybe" and "if," though, are not good science. Unless and until someone has shown that most god beliefs are electromagnetically produced without any recourse to god, a few, extraordinarily induced god beliefs are not sufficient to undermine the rationality of every religious believer.

We're very far from Perception Helmets, Memory Helmets and Moral Helmets. We're probably even further from Other Person Helmets and Feeling Loved Helmets. As of yet, there's no reason to believe in a God Helmet (one that induces, beyond randomness, a sense of God). At best Persinger has invented the Occasionally Awesome Feeling That Sometimes Involves a Sense of Others Helmet. And even if any of the above were to be invented, they would undermine just one's immediately produced belief, not trust in the cognitive faculties that are involved in their production. In order to cease trusting perception or memory, say, one would need good reason to think that most perceptual or memory beliefs were produced by direct electromagnetic stimulation and not by, say, a tree or an event from one's past.

[6] More complete versions of this argument can be found in my 2014, ch. 7. See also Clark and Barrett, 2010 and 2011. See also Schloss and Murray 2013.

And in order to cease trusting one's god faculty, one would need good reason to think that most god beliefs were produced by something like direct electromagnetic stimulation and not by god. Until that's been shown, neuroscientific claims to have undermined the rationality of belief in God lack sufficient support.

5 THE GOD GENE

In 2004, Harvard educated molecular biologist Dean Hamer published his sensationally titled, *The God Gene: How Faith Is Hardwired into Our Genes* (all reference and quotations from Hamer, 2004). The book was featured on the November 29, 2004 cover of *Time* magazine with the provocative subheading: "Does our DNA compel us to seek a higher power? Believe it or not, some scientists say yes." In his book, Hamer claims that he has located the gene, the God gene, responsible for human spirituality (the VMAT2 gene). The God gene, he claims, codes for the release of certain intoxicating brain chemicals that, when released, produce spiritual feelings. In the article he says, "I'm a believer that every thought we think and every feeling we feel is the result of activity in the brain. I think we follow the basic law of nature, which is that we're a bunch of chemical reactions running around in a bag." God is all in our genes.

In his study, Hamer assessed his subjects' religiosity using the "self-transcendence" portion of the Temperament and Character Inventory (TCI), which measures spirituality, vaguely understood as considering oneself an integral part of the universe. While his scale did not assess belief in a higher being, it did allow assessments of self-forgetfulness (one's ability to be immersed in the moment), harmony (identification of oneself as a part of the universe as a whole), and mysticism (one's degree of openness to the unexplained). Some sample true-false questions which aim at understanding one's level of self-transcendence include:

1. I often become so fascinated with what I'm doing that I get lost in the moment – like I'm detached from time and place.
2. I often feel so connected to the people around me that it is like there is no separation between us.
3. I am fascinated by the many things in life that cannot be

scientifically explained.

4. Often I have unexpected flashes of insight or understanding while relaxing.

5. I sometimes feel so connected to nature that everything seems to be part of one living organism.

Hamer next argued that various mood-regulating chemicals in the brain, monoamines (including serotonin and dopamine), are responsible for the positive and sometimes euphoric feelings of self-transcendence which he associates with spirituality.

Suppose he's correctly identified monoamines as key to the chemical reactions running around in the human bag that are positively associated with spirituality. His next step was to find the genetic basis of the production of monoamines (no easy task given that humans have 25,000 protein-coding genes).

Hamer examined his subjects' DNA samples in search of the genes that produced self-transcendence in people. He lighted on the gene known as VMAT2, which is involved in coding for proteins that make up monoamines. Since monoamines, he believed, are positively correlated with self-transcendence, he had found the self-transcendence gene. And, after sending the book to a publisher, the self-transcendence gene became the God gene. God is in our genes. According to Hamer, this and not a faithful and free response to the Transcendent, is why people believe in God.

Such sensational claims smack of genetic determinism—the claim that just as we have genes that determine the shape of our noses, say, or baldness, so, too we have genes that determine every aspect of human behavior from being a loner to having a vicious temper. The murderer might claim that he was genetically disposed to violence (and so couldn't help himself). A recent study discussed whether or not there is a gene for thrill-seeking. We read (and often believe), "There's a gene for that," a gene for, say, generosity, shyness, courage or compassion. But such claims are completely unsupported by science and ignore the significant role that environment plays in influencing human behavior. Moreover, genetic determinism violates our deepest sense of human dignity and free will. Our genes and environment may incline us toward certain behaviors and beliefs, but they don't compel or cause those behaviors and beliefs. At least there's no scientific reason to think they do.

Hamer had previously made a rushed, over-simplified and unsubstantiated claim about genes and behaviour. In 1993 he sensationally reported a genetic link to male homosexuality in a region of the X chromosome. Although Hamer would temper his claim to 99.5% certainty with "suggest," "seems to indicate" and "probably," the media incautiously rushed in claiming that science had discovered the gay gene (not entirely without some serious support from Hamer's study). No other researchers could replicate his results. But his own personal cautionary tale didn't stop Hamer from rushing *The God Gene* into publication without sufficient nuance or qualification.

The argument of the God gene was based on an ambiguous, unreplicated and unrefereed study. Even if substantiated, it measured a slight genetic tendency toward a very vague spirituality—unity, harmony, and mysticism; it said little or nothing, because people weren't assessed, about belief in God. Carl Zimmer, in his blistering review of Hamer's book in *Scientific American*(2004), suggested changing the title to *A Gene That Accounts for Less Than One Percent of the Variance Found in Scores on Psychological Questionnaires Designed to Measure a Factor Called Self-Transcendence, Which Can Signify Everything from Belonging to the Green Party to Believing in ESP, According to One Unpublished, Unreplicated Study*.

There is simply no reason to believe that "You just believe in God because your genes made you do it."

6 THE GOD-FACULTY

The God gene, the God Helmet and scientific "explanations" of near-death experiences are the most controversial and sensational ways of explaining God away based on the science of the brain. In every case the science is unsettled and yet it is often asserted as settled (with disastrous consequences for rational belief in God). There is, however, more a firmly established and widely held science of the brain and God—the cognitive science of religion, the science of the relationship between the mind and religious beliefs and practices. Cognitive science suggests that the brain is hardwired in such a way that people are inclined toward god-beliefs. Normal brains incite normal people in normal circumstance to belief in God. God beliefs are the perfectly ordinary and natural products of perfectly ordinary brain processes.

Suppose you are driving on the highway and are nearly run into by a speeding, swerving car. You instantly form a belief in agency—not in the car but in a person (in a car) with the ability to act of their own accord. Non-agents, like blades of grass in the wind or the fender of a car when hit by another car, just passively respond to forces. Agents, on the other hand, like humans and zebras and even amoebae, actively respond to various stimuli. But you do more than think of agency, you also quickly ascribe responsibility (respond-a-bility, might be better).

Now suppose the car is forced to stop at a red light and you pull up alongside. While you angrily glare at the driver you see the look on her face. Based entirely on her facial expressions, you instantly attribute fear and anxiety to the driver. What started as a mere attribution of agency immediately shifted to an attribution of intention and purpose (which, again, shifted upon seeing her face). You "read" the face (correctly), forming an immediate belief about the other driver's mental state. You look around the car's interior for clues: you see a child with blood on his face and arm, and you go on to infer that the driver is rushing her son to the nearby hospital. Your anger dissipates, replaced by sympathy.

Attributions of agency and intention equip us to *instantaneously*—that is, non-inferentially--form the beliefs we need to respond properly in a wide variety of circumstances. We don't infer agency and we don't reason to intention and purpose. We don't have an inner dialogue in which we argue ourselves into the belief that various sounds, sensations or experiences are caused by agents. We don't think, "Hmm, what could that be? The car whooshed by and most of the time when cars whoosh by me, they are directed by agents. You seldom read in the news about cars operating entirely on their own. So, probably, that car was directed or misdirected by an agent." We simply find ourselves detecting agents. A car whooshes by nearly clipping our bumper and we instantly find ourselves with an agent belief.

And then we act accordingly. What moved you to action? Your Agency Detection Device (ADD).[7] When we hear a strange and unidentified sound or have a human- or animal-like visual sensation, we think of a being that can act, perhaps one that can harm us. ADD is instigated sometimes with only the slightest stimulation,

[7] For a full account of the cognitive science of religion, see Barrett, 2004 and Atran 2002.

immediately (that is, non-reflectively or non-inferentially) producing beliefs in an agent. Being able to quickly respond to dangerous situations has obvious health benefits: sluggish responders are likely to end up dead. Our ancestors who were given to reflection in such circumstances—"Let's think about this carefully. Only one out of ten times does this sort of noise precede the entrance of an enemy who wishes to steal my food. Thus it is vastly more likely that this is not one of those times. On the other hand…."—would likely remove themselves from the gene pool. Nature instead has outfitted us with cognitive faculties that produce immediate response/beliefs independent of reflection precisely because of the urgency of these sorts of situations. Moreover, these faculties free up cognitive resources to do other things. Similar to breathing lungs and beating hearts, nature has equipped us with automatic believing and response processes that are essential to our survival.

We find ourselves almost as quickly believing (without inferring) the agent's intentions, feelings or purposes. If it's a person, we might instantly judge that person's anger, sadness or elation.

If it's a lion or tiger or bear, we instantly judge its intentions and then act, usually without reflection (typically we think hostile intentions and RUN!!!). We automatically judge human intentions—by the look on their face, the shrug of their shoulders, their gait—and then we act in response. Irresponsible teenager showing off for friends or scared mother afraid for her child? Unknowing or just unconcerned? Injured or arrogant? Studies show that human beings are, overall, pretty good at reading people's intentions from their faces.

Of course, a sensitive ADD is going to produce many true beliefs that elicit appropriate fight or flight responses; but it is also going to produce some *false positives*. ADD sometimes cries "Wolf!" Although ADD is a pretty reliable belief/action cognitive faculty, because of its hair-trigger sensitivity, ADD has been called the Hypersensitive Agency Detecting Device (HADD)

Awaking our slumbering ADD is not sufficient to move us to act. Do we stand there and hold our ground or flee to fight another day? Is it enemy, predator or friend? In addition to ADD, we are equipped, as noted, with the ability to grasp another person's inner or mental life based on what we see of their face and body. This

cognitive faculty has various names from Theory of Mind (ToM) to Mindreading. ToM doesn't settle for the simple postulation of mindless agency; ToM searches out the agent's intentions or purposes. Only if we are able to effectively postulate the agent's intention can we rationally act. Only by judging if they are angry or hungry or friendly, can we act accordingly. As soon as you started ascribing beliefs and desires to the agent in question, you kicked cognition into another gear called Theory of Mind (ToM). Your Agency Detection Device ascribed agency to the sound, and then Theory of Mind took over as you tried to understand the reason the agent was acting: is the agent looking for shelter or looking for food? Again, while at times ToM ascribes purpose to things that couldn't have intentions (to faces in the clouds, the distribution of stars in the sky (astrology), or to the plumbing noise that woke you up), it is an enormously useful cognitive faculty for instantly ascertaining purpose (which, in turn, allows us to quickly and effectively act in response).

In the normal course of human life, we perceive human forms, human faces, and human voices, and ADD automatically, non-reflectively attributes human agency as the source. "That's an agent," we think. Then a second cognitive system responsible for generating inferences related to mental states—the Theory of Mind (ToM)—is activated and automatically fills in details about the (human) agent's likely beliefs, desires, emotions, and so forth. That agent has intentions. By simply looking at another person's face, we are pretty good at judging their anger, fear, embarrassment or sadness. From the intonation in another's voice, we can detect irony and sarcasm. By watching a person walk we can "see" that they are joyously buoyant or weighed down by the world depressed.

ToM, like ADD, isn't infallible, of course. We make mistakes, and people lie and hide their real feelings. Nonetheless, most normally functioning human beings are pretty good at "mindreading"—instantly judging another person's thoughts, feelings and desires.

The Agency Detecting Device and Theory of Mind, fine as they are, are anything but infallible. Imagine walking through the woods at dusk and hearing a noise off to your left. You quickly turn and see, off in the distance, a face staring menacingly at you from afar. Your fears become palpable as your adrenaline pumps and your heart

rate increases. You wonder about that person's intentions (wayside robber or fellow traveler?). Your sweating brow indicates that you are erring on the side of caution—robber, not friend. You shine your flashlight directly on the face and see it for what it really is: a gnarly knot in a tree. Your fears slowly subside, but it will be a while before your blood pressure returns to normal. ADD and ToM, in this case, got it wrong.

We see agents when they're not there and we attribute intentions when they're not present (sometimes to things or events that don't have intentions). We hear a rustling bush and think *lion*. We see a lion and think *hungry*. We see a friend approaching but think *enemy*. Our crops get flooded and I think *I am being punished.* And so on and so on. It is precisely this misattribution of agency and intention that some cognitive scientists think produces belief in gods.

How did human beings get from agents and intentions all the way up to gods?

Some cognitive scientists speculate that ADD (of the hypersensitive variety) and ToM combined, through a series of misfirings, to produce beliefs in gods. Occasionally, sounds, shapes, patterns, or movement trigger a 'HADD-experience,' an attribution of agency that is inconsistent with any known natural agents such as humans or animals. In these situations, the activity of HADD may lead to the postulation of a different sort of agent such as a god. According to this view, misattributions of agency and misapplications of intention or purpose generate beliefs in gods.

If belief in God is simply the hypersensitive misattribution of agency, little wonder that, as noted, psychologist Paul Bloom contends that religious belief is "an incidental by-product of cognitive functioning gone awry." The psychological impulses that drive belief in God, according to Dawkins and Dennet, reveal God to be an illusion or a delusion (Dennett 2006; Dawkins 2006). Instead of responding to these assertions of irrationality directly, let me switch to a discussion of atheism.

7 ATHEISM

While belief in God is well studied, atheism has not received much attention. I suspect this is due to the following: the vast majority of those who work on these topics are atheists or agnostics who view religious belief as false and even bizarre. Given this

assumption, the project of psychological explanations of religion is to explain how otherwise rational people could hold obviously false beliefs. Unlike religious belief, their own beliefs (agnosticism or atheism), so the narrative goes, are products of coolly rational reflection—the triumph of reason over superstition. The project then is to seek out the malfunction that produces religious belief; atheism gets a free pass.

But if there are primal urges, neuronal impulses, or psychological drives that influence and even cause belief in God, couldn't there be similar causes of unbelief? Or are only theists neurotic?

While it would be nice to be able to settle the rationality or irrationality of belief in God in one fell swoop, Dawkins and Dennett have not done so. The god-faculty is not, for the most part, fiction-generating. ADD and ToM are both perfectly ordinary and truth-conducive. Every time you walk through the mall and see a person and make a judgment about them, you are using those faculties. More often than not, ADD and ToM produce true beliefs. ADD and ToM have occasionally produced false beliefs—we see, as Stewart Guthrie argues, faces in clouds and sometimes turn clouds into gods (Guthrie, 1995). But unless we wish to proclaim that we are all irrational for thinking there are other people, then we shouldn't think the faculties involved are fiction generators.

If atheism, on the other hand, were the product of a fiction generating mechanism and one were made aware of this fact, one would be irrational in maintaining one's atheism. Interestingly, recent studies suggest just such an irrationality contraption.

One critic of Eben Alexander's afterlife story, Oliver Sacks, has his own story of an unusual contact. Sacks was once hiking alone in the mountains of Norway when he happened upon an enormous and cantankerous bull. The bull startled him, and as he fled, he fell down a steep cliff landing with his leg twisted beneath him. With his dislocated knee in excruciating pain, he fashioned a splint from his umbrella and anorak and began his lonely and painful descent. On the way, believing himself to be near death he began feeling helpless and increasingly desperate. His body was screaming "Give up," and his mind was beginning to agree. He was just about to stop and rest when he heard "a strong, clear, commanding voice, which said, 'You can't rest here —

you can't rest anywhere. You've got to go on. Find a pace you can keep up and go on steadily.'" Yielding to the voice, he found the strength to carry on in spite of the crippling pain in his useless leg. He writes, "This good voice, this Life voice, braced and resolved me. I stopped trembling and did not falter again."[8]

Where some might have come to believe they had heard the still, small voice of God and given thanks, Sacks, instead, claims the voice was a hallucination. He attributes his hallucination to perfectly ordinary and not uncommon cognitive processes.

But suppose it wasn't a hallucination.

If there is a God, one who occasionally speaks to people in dire circumstances like those Sacks found himself in, there is a plausible scientific explanation for Sacks' unbelief. Autistic individuals, studies have shown, lack the mental tools necessary for relating to a personal God. And Sacks may have suffered from a mild form of autism. Autistic individuals, who may suffer from very mild to very severe forms of autism, lack the ability to impute thoughts, feelings, and desires to personal agents. This undergirds their lack of empathy which hinders, to varying degrees, their ability to enter into normal interpersonal relationships. The loving parent may speak to them, reach out to them, and embrace them, but the autistic child may be incapable of recognizing and responding to them.

In short, autistic individuals have difficulties cognizing a personal relationship with God (if there is a God). God may speak to them, reach out to them, and embrace them. But they find it difficult to recognize a personal God.

Is it possible that Sacks was afflicted with such a condition? Sacks suffered his entire life from a malady called prosopagnosia, more popularly called "face blindness." Those who suffer from face blindness lack the ability to recognize or remember faces, sometimes even the faces of members of their own family or close friends. Every time they look at their mother, for example, they may see a stranger; they may recognize their mother's smell or distinctive gait but they simply cannot recognize their mother's, or anyone else's, kindly gaze. Sacks himself was often incapable of recognizing his own face in a mirror. Interesting as this may be, here is the key point for our discussion: face

[8] All references and quotations are from Sacks 2013.

blindness is common among people with autism spectrum disorders. Face blindness may be associated with the autistic individual's lack of empathy. How can you tell what a person is thinking or feeling when you can't distinguish a face from an object, recognize the person speaking to you, or "read" a face? And if you can't tell what a person is thinking or feeling, you can't respond to them as persons.

Sacks has described himself as mostly a loner and his shyness as a "disease." Given his face blindness, difficulties in communication, and lonerism, one might (as an amateur psychologist) conclude that Sacks is a high-functioning autistic, perhaps suffering from Asperger's syndrome.[9] If you were to make such a diagnosis, you would join company with some of Sacks's friends, some of whom are likely trained psychologists. In an interview, he states: "I was and remain somewhat shy. I don't readily open conversations; I certainly think difficulty recognizing people plays a part there. I have been said to suffer social phobia [or] Asperger's [but I think] that overstates it."[10]

I am not a psychologist and my point is not to diagnose Sacks. My point is to make this point: if Sacks were autistic, he might be incapable of responding to a personal God.

This is science speaking. Autistic individuals, to varying degrees, find it very difficult to grasp the personal clues—verbal and non-verbal expressions of thoughts, feelings, and desires—that are so essential to personal relationships; and so, if there is a God and he is speaking, autistic individuals may be unable to understand and respond.[11]

Suppose that God had, in fact, spoken to Oliver Sacks in his still, small voice. If Sacks is autistic, he might be constitutionally incapable of recognizing and responding to God's voice.

Recent studies demonstrate a correlation between atheism and autism—one is vastly more likely to be an atheist or agnostic if one is autistic. The higher up one is on the Autism Spectrum, the more likely one is to be an atheist. Psychologists Ara

[9] Symptoms of Asperger's syndrome, a form of autism, include, among many other things, difficulty in social interactions, inability to read and respond to normal social cues, and difficulty in making friends.
[10] Maia Szalavitz, "Q&A: An Interview with Oliver Sacks," *Time: Health & Family*, October 27, 2010, healthland.time.com/2010/10/27/mind-reading-an-interview-with-oliver-sacks/#ixzz13ehl5WZn
[11] See Clark and Visuri, forthcoming; and Baron-Cohen, 1995.

Norenzayan, et. al. contend that "mentalizing deficits"—the inability to "see" the beliefs, feelings and desires of other persons--incline autistic individuals towards atheism (Norenzayan, 2012). Since people with higher scores on the Autism Spectrum Quotient had a reduced ability to mentalize, they claim that mentalizing deficits mediated increased tendencies towards atheism and agnosticism (Caldwell-Harris, 2011). As noted, recent work in cognitive science of religion shows the centrality of mentalizing (which we called above "ToM") to typical religious beliefs. If God is personal, then a properly functioning ToM may be necessary for belief in God; mentalizing deficits, therefore, may hinder or even prevent belief in God.

8 WHO IS RATIONAL?

Religious beliefs are sometimes mediated by properly functioning cognitive faculties (theory of mind and agency detecting device) and atheism is sometimes mediated by a cognitive malfunction—a defective theory of mind characteristic of autistic individuals. Are theists, therefore, rational and atheists, therefore irrational?

We should agree, I think, that if one's atheism were indeed mediated by a mentalizing deficit, then one's belief would be irrational (if one were apprised of the real cause of one's belief). But we simply have no idea whether or not any particular person's belief was produced by a malfunctioning ToM; we can't peer into another person's mind to determine if they had been prevented from believing something true by virtue of a malfunctioning cognitive faculty. And if we can't know if a particular person's belief was mediated by a cognitive defect or by, for example, deep reflection on the problem of evil, we cannot know if any particular person's atheism is rational or irrational.

Likewise, we can't know, in the case of the theist, if her belief was mediate solely by a hypersensitive agency detection device or a properly functioning theory of mind responding to the promptings of a personal god. CSR has not and could not show anything like that at all. It may show what cognitive faculties are involved in thinking about God. And it can suggest how religious beliefs *might have* arisen in some of the earliest human communities. Yet, the cognitive and evolutionary psychology of religion knows nothing of the origin and sustenance of the religious beliefs of the ancient

Hebrews, St. Paul, Mohammad, Confucius, or my grandmother. Very different people in very different circumstances. Moreover, we have no idea if the origin of their beliefs was the misfiring of ADD and ToM, reflection on the nature of the cosmos, or an encounter with the divine. If one is an atheist, one will reject the latter option out of hand. So be it. But the atheist's personal beliefs are irrelevant to the rational warrant of the religious believer.

We think God with our brains. A science that isolates and identifies those parts of our brains should not come as a surprise. Some parts of our brains may on occasion produce, without divine instigation, god beliefs. But learning of the infallibility of one's otherwise reliable cognitive faculties does not defeat one's rationality in holding beliefs produced by that faculty. My perceptual faculties sometimes produce hallucinations but I needn't reject the deliverances of my perceptual faculties. One can't know if ADD and ToM are misfiring with respect to God beliefs unless one already knows that there is no God. In order to undermine one's rationality, one would have to show that the cognitive faculties involved can misfire and that there is no God.

What about the atheist's rationality? Even if the atheism-autism connection were indisputably established, we simply cannot know, in any particular case involving any particular individual, the cognitive processes involved. The studies at most show general tendencies of groups of people, tendencies which tell us nothing at all about any particular member of the group. Here's another way of putting it: not all men are from Mars, not all women are from Venus. And another way: not all women are bad at math and not all men are good at math.

9 CONCLUSION

Instead of judging the rationality of those with whom one disagrees, I suggest listening to the stories of particular people to humanize and individualize both religious belief and religious unbelief. For example, most autistic individuals are religious believers with religious beliefs and practices formed and shaped in ways that have been influence by their cognitive styles—their dislike of groups leads some to dislike standard worship services and huggy religious practice; their sensitivity to noise leads some to avoid noisy-clappy praise services; their need for isolation leads some to more

quite, contemplative religious disciplines; and their active rationalizing-systemizing faculties, lead some to a more impersonal, moral force than to a personal God. Some autistic individuals are unbelievers; some of that unbelief was likely mediated a mentalizing deficit. But every person is an individual with her own very contingent cognitive makeup within a very particular social context. So each autistic individual should be treated as an individual not psychopathologized by being lumped into a group. Since we don't have access to the inner springs and mechanisms involved in any individual's cognition, I suggest a shift from judgment to understanding: away from judging the rationality of a individual's religious beliefs or unbelief away toward understanding a person's life and story (from her perspective). As a wise man once said, "Judge not that ye be not judged."

With respect to the rationality of atheism and agnosticism, Norenzayan, Gervais and Trzeniewski offer wise counsel: "We emphasize that our data do not suggest that disbelief solely arises through mentalizing deficits; multiple psychological and socio-cultural pathways likely lead to a complex and overdetermined phenomenon such as disbelief in God" (Norenzayan, 2012). This is surely the conclusion to be drawn. Such dynamics are also necessary to include in autism studies, embracing the fact that also people on the autism spectrum are individuals. Changing equals for equals, we can say the same about the theist: "We emphasize that our data do not suggest that belief solely arises through HADD and ToM; multiple psychological and socio-cultural pathways likely lead to a complex and overdetermined phenomenon such as belief in God."

Since we can't see inside another's mind to see either their beliefs or their mental shortcomings, humility, not judgments of another's rationality or character seems the order of the day.

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