

# The Mind, the Brain, and God

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## Abstract

With all the research on mind/brain connections these days — *Your brain in lust or love! While gambling or feeling envious! While meditating, praying, or having an out-of-body experience!*— it's natural to wonder about Big Questions about the relationships among the mind, the brain, and God.

For instance, some people have taken the findings that some spiritual experiences have neural correlates to mean that the hand of God is at work in the brain. Others have interpreted the same research to mean that spiritual experiences are «just» neural, and thus evidence against the existence of God or other supernatural forces. These debates are updated versions of longstanding philosophical and religious wrestlings with how God and nature might or might not intertwine.

What's your own gut view, right now, as a kind of snapshot: Do you think that God is involved in some way in your thoughts and feelings? In your most intimate sense of being?

In this essay, we'll explore what mind, brain, and God could be, how they might interact, and what studies on the neuropsychology of spiritual experiences can —and cannot— tell us.

**Keywords:** neuropsychology; spiritual experiences; Theology.

## Resumen. *Mente, cerebro y Dios*

Con toda la investigación actual sobre las conexiones mente/cerebro —*¡el cerebro lujurioso o enamorado! ¡el cerebro apostando o sintiendo envidia! ¡meditando, rezando, o teniendo una experiencia extracorporal!*—, es natural plantearse las grandes preguntas acerca de las relaciones entre la mente, el cerebro y Dios.

Por ejemplo, algunas personas han interpretado los resultados de investigar los correlatos neuronales de algunas experiencias espirituales en el sentido de que la mano de Dios está obrando en el cerebro. Otros han interpretado esa misma investigación en el sentido de que las experiencias espirituales son «solo» neuronales, y por tanto pruebas contra la existencia de Dios u otras fuerzas sobrenaturales. Estos debates son versiones actualizadas de antiguas luchas filosóficas y religiosas sobre si Dios y la naturaleza interactúan y de qué manera.

¿Cuál es tu punto de vista intuitivo, ahora mismo? ¿Crees que Dios está involucrado de alguna manera en tus pensamientos y sentimientos? ¿En tu sentido más íntimo del ser?

En este ensayo, vamos a explorar lo que la mente, el cerebro y Dios puedan ser, cómo pueden interactuar, y lo que los estudios sobre la neuropsicología de las experiencias espirituales pueden —y no pueden— decirnos.

**Palabras clave:** neuropsicología; experiencias espirituales; teología.

### Summary

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| The Interdependent Mind and Brain | No Soul?                          |
| Proofs and Disproofs              | Summing Up                        |
| Is the Mind «Just» the Brain?     |                                   |

## What the Words Mean

The more profound the subject, the murkier the discussion. There's a lot of fog and illogic in books, articles, and blogs about the potential relationships among the mind, the brain, and God. In this territory, it's particularly important to be clear about key terms—like mind, brain, and God.

So—by *mind*, I mean the information represented by the nervous system (which has its headquarters in the *brain*—the three pounds of tofu-like tissue between the ears). This information includes incoming signals about the oxygen saturation in the blood and outgoing instructions to the lungs to take a bigger breath, motor sequences for brushing one's teeth, tendencies toward anxiety, memories of childhood, knowing how to make pancakes, and the feeling of open spacious mindfulness. Most of mind is outside the field of awareness either temporarily or permanently. Conscious experience—sensations, emotions, wants, images, inner language, etc.—is just the tip of the iceberg of mental activity. The nervous system holds information much like a computer hard drive holds the information in a document, song, or picture. Hardware represents software.

Immaterial information is categorically distinct from its material substrate. For example, often the same information (such as Beethoven's 9<sup>th</sup> Symphony) can be represented by a variety of suitable material substrates (e.g., sound waves, music score, CD, iPod). Therefore, at one level of analysis, Cartesian dualism is correct: information and matter, mind and body, are two different things. Nonetheless—as we will see—at another, higher level of analysis, it is clear that the mind and the nervous system arise interdependently, shaping each other, as one integrated process. (And perhaps at a lower level of analysis—that of quantum phenomena—information and materiality are inextricably woven together; but I'm not going there in this essay!).

Mind, as I define it here, occurs in any creature with a nervous system. Humans have a mind—and so do monkeys, squirrels, lizards, worms, and dust mites. More complex nervous systems can produce more complex minds.

But just as there is a spectrum of complexity of the nervous system, from the simplest jellyfish 600 million years ago to a modern human, there is a similar spectrum of complexity in the mind. Or to put it bluntly, there is no categorical distinction between the mind of a millipede and a mathematician. The difference is one of degree, not kind. (And how many mathematicians—or anyone, for that matter—could move dozens of limbs together in undulating harmony?).

By *God*, I mean a transcendental Something (being, force, ground, mystery, question mark) that is outside the frame of materiality; *materiality* includes matter and energy since  $E=mc^2$ , plus dark matter/energy, plus other wild stuff that scientists will discover in the future. God is generally described in two major ways: as an omniscient and omnipotent being «who knows when a sparrow falls», or as a kind of Ground from and as which everything arises—with many variations on these two views, plus syntheses and divergences.

By definition, while God may intersect or interact with the material universe, it is in some sense other than that universe—otherwise we don't need another word than «universe». For example, if someone says that God is the same thing as nature, that begs the question of whether God exists, distinct from nature.

## The Interdependent Mind and Brain

Let's review three facts about the mind and the brain.

First, when your brain changes, your mind changes. Everyday examples include the effects of caffeine, antidepressants, lack of sleep, and having a cold. More extreme examples: concussion, stroke, brain damage, and dementia.

Without a brain, you can't have a mind. The brain is a *necessary* condition for the mind. And apart from the hypothetical influence of God—which we'll be discussing further on—the brain is a *sufficient* condition for the mind. Or more exactly, a proximally sufficient condition for the mind, since the brain intertwines with the nervous system and other bodily systems, which in turn intertwine with nature, both here and now, and over evolutionary time; and as you'll see in the next paragraph, the brain also depends on the mind.

Second, when your mind changes, your brain changes. Temporary changes include the activation of different neural circuits or regions when you have different kinds of thoughts, feelings, moods, attention, or even sense of self. For example, the anterior (frontal) cingulate cortex gets relatively busy (thus consuming more oxygen) when people meditate; the caudate nucleus in the reward centers of the brain lights up when college students see a photo of their sweetheart; and stressful experiences trigger flows of cortisol into the brain, sensitizing the amygdala (the brain's alarm bell).

Mental activity also sculpts neural structure, so changes in your mind can lead to lasting changes in your brain. This is learning and memory (as well as lots of other alterations in neural structure below the waterline of conscious awareness): in other words, *neuroplasticity*, most of which is humdrum, like

remembering what you had for breakfast, or getting more skillful at chopsticks with practice.

Examples of neuroplasticity include:

- Meditators have a thicker anterior cingulate cortex and insula (a part of the brain that tracks the internal state of the body); a thicker cortex means more synapses, capillaries (bringing blood), and support cells.
- Cab drivers have a thicker hippocampus (which is central to visual-spatial memory) at the end of their training, memorizing the spaghetti snarl of streets in London.
- Pianists have thicker motor cortices in the areas responsible for fine finger movements.

Within science, it has been long presumed that mental activity changed neural structure —how else in the world could any animal, including humans, learn anything?— so the idea of neuroplasticity is not news (though it's often erroneously described as a breakthrough). What *is* news is the emerging detail in our understanding of the mechanisms of neuroplasticity, which include increasing blood flow to busy neurons, altering gene expression (epigenetics), strengthening existing synapses (the connections between neurons), and building new ones.

This growing understanding creates opportunities for *self-directed neuroplasticity*, for using the mind in targeted ways to change the brain to change the mind for the better. Some of these ways are dramatic, such as stroke victims drawing on undamaged parts of the brain to regain function. But most of them are the stuff of everyday life, such as building up the neural substrate of well-controlled attention through meditative practice. Or deliberately savoring positive experiences several times a day to increase their storage in implicit memory, thus defeating the brain's innate negativity bias, which makes it like Velcro for negative experiences but Teflon for positive ones. (You can learn more about self-directed neuroplasticity in my book *Buddha's Brain*).

Third, the mind and brain co-arise interdependently. The brain makes the mind while the mind makes the brain while the brain makes the mind... They are thus properly understood as one unified system.

### Proofs and Disproofs

Lately, numerous authors have tried to rebut beliefs in God (e.g., *The God Delusion*, by Richard Dawkins), while others have tried to rebut the rebuttals (e.g., *Answering the New Atheism: Dismantling Dawkins' Case against God*). The intensity of these debates is often startling; people commonly talk past each other, arguing at different levels; and the «evidence» marshaled for one view or another is often hollow. (A delightful exception is the dialogue between Andrew Sullivan and Sam Harris).

For example, it's an error to conflate religion and God. Whether religions are wonderful or horrible or both is not evidence for or against the existence of God. Critiques of religion (e.g., the Crusades, fundamentalism) are not disproofs of God. It's also an error to think that biological evolution is evidence for the nonexistence of God. Just because a creation story developed thousands of years ago turns out to be inaccurate does not mean that God does not exist. Evolution does not need to be attacked in order to have faith in God.

Then there are so-called proofs of the existence of God within the material universe (e.g., burning bushes, miracles, visions, psychic phenomena). But that «evidence» must be experienced via the brain and mind. Therefore, in principle, that experience could simply be produced by the mind/brain alone, without divine intervention. (You could assert that God is known by some transcendental faculty outside of materiality, but then you'd still have to explain how the knowing achieved by that transcendental faculty is communicated to the material brain, so you are back to the original problem, that the ordinary brain could be making up information purportedly derived from a transcendental source.) So you can't prove the existence of the transcendental through material evidence.

On the other hand, since any God by definition extends beyond the frame of materiality, nothing in the material universe can disprove its existence. You could endlessly rebut apparent evidence for the existence of God, but those rebuttals can not in themselves demonstrate that God is a fiction. At most, they can only eliminate a piece of apparent evidence, but in terms of ultimate conclusions, so what? As scientists say, the absence of evidence is not evidence of absence. Further, a God outside the frame of materiality (particularly a playful one) could amuse herself by fostering rebuttals of seeming evidence for her existence in order to bug some people and test the faith of others: who knows? Most anything could be possible for a transcendental being, ground, something-or-other.

Bottom-line: You can't prove or disprove the existence of God. So the fundamentally scientific attitude is to acknowledge the possibility of God, and then move on to working within the frame of science, which is plenty fertile as is, without resorting to God.

Let's explore an illustration of how these issues often play out in the media.

### **Is the Mind «Just» the Brain?**

Recently a friend sent me an article on the National Public Radio (NPR) website, titled «Study narrows Gap between Mind and Brain» about some new research. The investigators had found that suppressing neural activity in a part of the brain (on the right side, near where the temporal and parietal lobes come together) changed the way that subjects made moral judgments: they became less able to take the intentions of others into account.

The study itself is interesting, and takes its place in a growing body of research on the neuropsychology of moral reasoning and behavior. But the

article about it on the NPR site contains comments from a scholar from a leading university that are worth examining. He is initially quoted as saying: «Moral judgment is just a brain process». Hmm. What does the «just» mean? He could have said something like, «Moral judgment involves processes in the brain», but instead he seemed to assert that the psychological subtleties of ethics, altruism, hypocrisy, and integrity, are *just* epiphenomena of the brain. Whether this is exactly what he meant or not, let's consider this idea in its own right: that our thoughts and feelings, longings and fears, and subtle moral or spiritual intimations are «just» the movements of the meat, to put it bluntly, between the ears. This is a common notion these days, but there are numerous problems with it.

First, neural processes certainly do underlie mental processes. For example, as the study showed, normal right temporal-parietal function underlies reflections about the intentions of others in moral reasoning. But those *neural activities are in the service of mental ones*. That's their point. We evolved neural structures and processes in order to further psychological adaptations that conferred reproductive advantages, which is the engine of biological evolution. Mind is not an epiphenomenon of brain: mind is the *function* of the brain, its reason for existence.

Second, *mental processes pattern neural structure*. Morality-related information—in other words, mental activity—has shaped the brain of each person since early childhood. As Dan Siegel puts it, the mind uses the brain to make the mind. In a basic sense, it would be just as accurate to say that «the brain is just the mind writ in neural tissues».

Third, the neural substrates of conscious mental activity are continually changing in their physical details (e.g., neurons involved in a substrate, connections among them, and neurochemical flows). This means that the thought « $2 + 2 = 4$ » on Monday maps to a different neural substrate than it does on Tuesday; in fact, that math fact would have a different substrate if you rethought it only a few seconds later on Monday! Similarly, reflections on the Golden Rule on Monday will have a different neural substrate than on Tuesday. Consequently, *it is the meaning of the thought that is fundamental, not its neural substrate*. Taking this a step further, the ideas that two and two are four, or that we should treat others as we would like them to treat us, can be represented in many sorts of physical substrates, including marks on a page, patterns of sound waves, and magnetic charges on a computer hard drive. Here, too, it is the information, the meaning, that is the key matter, and the physical substrate, whether brain or something else, recedes in significance.

Fourth, and most fundamentally, *the mind and the brain co-dependently arise*. It's kind of silly to make one causally senior to the other. Psychology shapes neurology shapes psychology shapes neurology, and so on. These two are distinct—immaterial information is not material neural tissues—but they are also interdependent and cannot be understood apart from each other. There is indeed a dualism between mind and matter, but they also form one coherent system. When people try to de-link mind and brain, and then argue

that one rather than the other is primary — *The mind is really just the brain at work!* or *The brain is really just the mind at work!* — there is usually some sort of agenda going on: typically either an attempt to argue a strongly materialist, even atheist view, or to argue a fundamentalist spiritual view. But arguments about the primacy of either mind or brain are just not productive: all they produce is smoke and heat, but no light.

### Do Neural Correlates Mean There's No Soul?

The last sentence in the article on the NPR site really caught my eye: «If something as complex as morality has a mechanical explanation, [the scholar said], it will be hard to argue that people have, or need, a soul».

First, to repeat the point made in the section just above, it's simplistic to claim that morality has a «mechanical explanation» —in other words, that morality boils down to «just» the operations of the material (= mechanical) brain— simply because there are neural correlates to moral experience and action.

Second, to the heart of the matter, the closing sentence refers to the view, held by different religions and philosophies, that the fundamental source of morality —and by extension, human goodness, compassion, altruism, kindness, etc. — is transcendental, such as a proposed soul, divine spark, or Mind of God. In the culture wars of the last few decades, studies on the neural substrates of the loftier realms of experience and behavior (including the one discussed here, on moral judgment) have been taken as evidence by some that we don't need transcendental factors to account for those aspects of a human life —and by extension, that such transcendental factors do not exist: in other words, that «people do not have or need a soul». Let's try to unpack this.

Human psychology alone —without reference to transcendental factors— can fully account for morality, or it cannot. (And as we've seen, that psychology is inextricably intertwined with our neurology.) Separately, either there are transcendental factors or there are not. If we do not make the assumption that morality is based on God, then *evidence that morality requires only a mind and brain is not evidence against the existence of God.*

You see a similar fallacy in the cultural conflicts over the implications of biological evolution. If one believes that «God created Man», then evidence that modern humans gradually evolved from hominid and primate ancestors sounds like an argument against the existence or importance of God. Those who think that evolution would somehow eliminate God consider evidence for it to be a kind of blasphemy, so some school boards have tried to slip creationism into science textbooks.

Yes, the evolutionary account of life on this planet does undermine the story of God the Creator in the book of Genesis, but that's just one portrayal of the nature of God. Setting aside that particular portrayal leaves plenty of other ways that God could work in the world. Evidence that God did not create Man is not evidence that there is no God: in principle, God could exist

and not have created Man. In other words, a reasonable person could believe both that evolution has unfolded without being guided by the hand of God *and* that God exists—and similarly believe that morality does not require God and that God exists. It is a category error, and a deeply unscientific one, to think that evidence *for* the neuropsychological substrates of morality is evidence *against* a soul (or against other transcendental factors).

In this light, one does not need to resist evidence for evolution, or for the neuropsychology of morality or spiritual experiences. This point has significant social implications, because the resistance to scientific findings out of a fear that they somehow challenge faith has dramatically lowered scientific literacy in America. For example, in the 2008 biannual survey by the National Science Board of scientific understanding, only 45% of respondents agreed that, «Human beings, as we know them today, developed from earlier species of animals». This percentage is much lower than in Japan (78%), Europe (70%), China (69%), and South Korea (64%). Similarly, only 33% of those surveyed agreed that, «The universe began with a big explosion».

### Summing Up

To be clear: I am not asserting that there is or is not God; nor am I asserting that, if God exists, he/she/it/none-of-the-above plays a role in mind, consciousness, or morality. I *am* asserting that attempts to draw inferences from neuropsychology about God's existence or role in human affairs are usually a waste of time. At most such inferences can refute a particular theory about God's role in life—such as God is necessary for human morality, or for the existence of our species altogether. But that leaves all sorts of other theories about God that are not yet disproved—as well as the fundamental matter that God is by definition categorically outside the realm of proofs or disproofs within the material universe.

God may or may not exist. You have to find your own beliefs in that regard—and brain science will not help you.