

Physicalism vs. Dualism: Can Consciousness Be Fully Explained by Physical Science?

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Abstract. This paper examines the enduring metaphysical and epistemological problem of consciousness through physicalism and dualism. Physicalism, supported by extensive neuroscientific evidence, maintains that consciousness is entirely contingent upon or identical to physiological processes. Empirical findings from neuroimaging, brain injury studies, and psychoactive modulation support a systematic dependence of mental phenomena on neural substrates. However, the “hard problem of consciousness” exposes an explanatory gap between physical descriptions and phenomenal experience. Jackson’s knowledge argument and the philosophical zombie’s argument underscore this gap, suggesting that physicalist accounts may be ontologically incomplete. Dualism, while preserving the irreducibility of qualia, is hard to explain the mind-body interaction and concord with the physical principle of causal closure. Alternative frameworks, including panpsychism and illusionism, attempt to reconcile these tensions but introduce new conceptual challenges. The paper concludes that neither paradigm offers a wholly satisfactory account of consciousness. A comprehensive resolution may require a radical reconsideration of both the physical and the mental. This would resemble the paradigm shifts represented by quantum theory. Consciousness, therefore, remains the unresolved problem at the intersection of philosophy, neuroscience, and metaphysics.

Keywords: Consciousness, Physicalism, Dualism

1. Introduction

The nature of consciousness, or the innate, personal sense of being, recognizing red, feeling pain, or enjoying chocolate, is one of the most important and long-lasting mysteries in human history. This subjective experience, referred to as qualia, forms the essential foundation of human existence, despite its inherently elusive nature. The principal inquiry regarding the holistic comprehension of subjective reality via the brain’s physical mechanisms resides within the ongoing philosophical dichotomy between physicalism and dualism. Physicalism, the dominant paradigm in the scientific disciplines, posits that all entities in the universe, including consciousness, are fundamentally physical or contingent upon the physical, thereby allowing for comprehensive explanation through physical inquiry. Dualism asserts that consciousness is a non-physical entity or characteristic separate from the brain’s physical substrate. There is a strong and growing body of evidence from neuroscience that supports physicalism. However, a thorough analysis uncovers a substantial

problem with concepts that obfuscate the relationship between objective neurological states and subjective perceptions. This gap leads to dualistic intuitions, which, even though they have a lot of metaphysical problems, directly address the hard problem that physicalism seems to be unable to solve.

2. The case for physicalism

The argument for physicalism is robust, grounded in empirical evidence that elucidates a distinct and accurate correlation between mental states and brain states. It is easy to do: watch how the physical system changes and write down how the mental domain changes in a way that is similar to how the physical world changes. Contemporary neuroscience, which includes neuroimaging modalities such as functional magnetic resonance imaging (fMRI) and positron emission tomography (PET) scans, constantly shows that specific conscious experiences correlate with particular brain activities [1]. The fusiform face area is linked to how people see faces, while the amygdala controls how people feel fear and other emotions. This is not just a passive link; a causal intervention changes the link into a dependence. Transcranial magnetic stimulation (TMS) and analogous therapies can temporarily modify or augment brain activity in a specific area, leading to foreseeable and frequently substantial changes in consciousness. Activating the visual cortex can cause phosphenes, which are flashes of light that aren't caused by anything outside the body. Damage to Broca's area, which is important for language production, can make it hard to speak for a short time. This clearly shows that changing the physical substrate changes the conscious experience, showing that there is a link that goes beyond chance.

Cases of brain injury and the effects of psychoactive substances clearly show how much the mind depends on the brain. The remarkable case of Phineas Gage, whose personality shifted drastically from responsible and mild-mannered to impulsive and irreverent after a tamping iron injury to his prefrontal cortex, was an early and compelling illustration of the physiological basis of personality and self-regulation [2]. Damage to the hippocampus, which is located deep in the temporal lobe, may prevent the formation of new conscious memories and causes anterograde amnesia. This situation makes it clear what parts of the brain are needed for conscious awareness of one's own history. In the same way, taking psychoactive drugs—chemicals that are only physical—changes the brain's complex chemistry, which has a big effect on consciousness. It is clear that there is a direct link between physical molecules and subjective feelings. Opioids are bound to opioid receptors to create feelings of euphoria, while LSD interacts with serotonin systems to create complicated hallucinations. If consciousness were an independent, non-physical entity, what explains its complex and systematic responsiveness to the brain's physical state? Now, in light of compelling evidence, physicalists arrive at the most straightforward and economical conclusion that consciousness is not merely linked to, but is fundamentally identical to, or at least entirely generated by, the brain's activity. J. J. C. Smart, a philosopher, said that if mental experiences and brain states were not the same, it would be a "positively irrational" cosmic coincidence for them to be so closely related.

3. The challenges for physicalism

Despite its empirical robustness, physicalism encounters a substantial philosophical challenge, famously termed the "hard problem of consciousness" by philosopher David Chalmers. This dilemma differentiates what he designates as the "easy problems" from the hard problem itself. The primary challenges consist of comprehending how the brain synthesizes information from multiple senses, allocates attention, delineates cognitive processes, and differentiates between various inputs.

These problems have to do with carrying out functions. They are scientifically complicated, but they fit in well with the traditional way of explaining things physically, which involves finding a mechanism and explaining how it works. The hard problem has to do with the nature of subjective experience itself. What is the reasoning and methodology through which this intricate electrochemical information processing generates an internal, qualitative, subjective experience? What component of C-fiber activation in the brain provokes emotional responses in individuals? How does the visual system's processing of a particular wavelength of light enable the differentiation of a red object while simultaneously invoking the subjective, ineffable essence of redness? One can comprehend all the physical elements of the visual system, such as the retina and the optic nerve; however, this objective, third-person knowledge appears inadequate in clarifying the first-person experience of redness. Joseph Levine calls this the "explanatory gap." Even if there is a perfect link between a brain state (B) and an experience (E), one might still ask, "Why does B correspond with E, instead of the absence of experience or an alternative experience, like the taste of chocolate?" Current scientific methodologies, aimed at clarifying structures and functions, seem insufficient in addressing the discrepancy between physical descriptions and phenomenal experiences.

Frank Jackson's "knowledge argument" effectively illustrates the insufficiency of physical information. It is a thought experiment. Jackson pictures Mary, a well-known neuroscientist who has lived her whole life in a room with only black-and-white walls and a black-and-white TV. She has learned a lot about how color vision works through television. She knows a lot about how the body works, such as the exact wavelengths of light, how retinal cone cells respond differently, the neural pathways to the visual cortex, and the brain states that are linked to seeing red. Jackson then asks an important question: when Mary finally leaves her room and sees a red tomato for the first time, does she learn anything new? Jackson convincingly argues that she does—she experiences the sensation of seeing red. He asserts that this newfound understanding pertains to a non-physical fact—the qualitative essence of experience—which was absent from her extensive physical knowledge. If Mary learns something new from the experience, then physicalism, which says that all facts are physical facts, must be wrong. The physical characterization of the world, despite its power and magnitude, seems to neglect the most immediate and tangible aspect of human existence: subjective experience.

Physicalists have energetically confronted these matters. Some, like Daniel Dennett, take a "revisionist" or "illusionist" view and say that the hard problem is a kind of cognitive illusion [3]. In his work, Dennett suggests a "multiple drafts" model, positing that consciousness is not a singular, central stream but a concurrent process of content fixations distributed throughout the brain. The so-called "hard problem" of qualia does not exist because qualia are intrinsic qualities that do not exist; instead, they are merely tendencies to exhibit and articulate specific states. Some physicalists respond to the knowledge argument by saying that what Mary learns is not new factual knowledge but a new skill, like being able to see, remember, and picture the color red. This is a different kind of "knowing-how" than "knowing-that." But for many people, these answers seem to go off topic. Describing how prejudice works or why people report things is an easy way to deal with functional issues without getting into the difficult topic of personal experience. The physicalist explanations may be enough to explain the instruments in the orchestra and the score being played, but they don't seem to say anything about the most important thing: the existence of music itself.

4. The case for dualism

The enduring and vexatious attributes of the hard problem reinforce dualism, which posits that mind and matter are intrinsically distinct substances, as illustrated by Cartesian substance dualism, or at the very least, two autonomous categories of properties, as seen in contemporary property dualism. René Descartes, the foremost advocate, posited that the mind is a non-extended, thinking substance (*res cogitans*), fundamentally distinct from the body, which is an extended, non-thinking substance (*res extensa*). Chalmers and other modern property dualists say that there is only one substance, which is the physical. This substance has both physical properties (like mass and charge) and mental properties that cannot be broken down (like the feeling of pain or the sight of green) [4]. The principal evidence for dualism resides not in a laboratory setting, but within the subjective experiences of consciousness. What sets thoughts, feelings, and sensations apart from objects studied by physics, chemistry, and neuroscience is that people can directly access them. Neurons, synapses, and sodium ions all live in a public, objective, third-person space and can be measured. Pain's pulsating quality, thought's deliberate nature, and memory's wistful ache are intimate, subjective experiences that possess a qualitative essence unexpressed by physical representations. This intuitive, phenomenological distinction constitutes the foundation of dualist doctrine.

The notion of "philosophical zombies" serves as a coherence argument in favor of dualism [5]. A philosophical zombie is a made-up creature that looks exactly like a conscious person down to the smallest details, like skin cells and synaptic arrangements, but has no subjective experience at all. There is no experience of being a zombie. Chalmers says that if one can logically picture a zombie, then consciousness cannot supervene on the physical world. Instead, its existence must mean that there is another reality in the world that is not physical. The argument posits that if consciousness is genuinely and intrinsically physical, then a physical replica would inherently possess consciousness. The ability to conceive of a non-conscious state implies that awareness is an extrinsic component within the actual universe. Although the existence of zombies is unsubstantiated, the scenario's plausibility illustrates that the connection between the physical and the mental is not a logical imperative, thereby contesting the fundamental physicalist assertion that the mental is merely a byproduct of the physical.

5. The challenges for dualism

Nonetheless, dualism encounters significant challenges. One of the most formidable challenges is the interaction problem [6]. If the mind and brain are separate substances, or if mental attributes are inherently non-physical, what is the nature of the mind-brain interaction? Descartes famously suggests that the pineal gland is the place where things happened, but this only indicates where the problem is, not how to fix it. How can a thought that is not extended, not physical, and does not have mass or energy make a neuron fire? This seems to go against basic laws of physics, like the conservation of energy, which says that energy cannot be created or destroyed but only changed. If a non-physical mind can energize the brain and make it do something, it would be creating energy out of nothing. On the other hand, if a physical event (like stubbing your toe) causes a mental event (like feeling pain), it seems that energy is lost from the physical system. Modern science asserts that the physical universe is causally closed; therefore, every physical event possesses a sufficient physical cause [7]. From a scientific point of view, suggesting a non-physical cause for a brain event is both unnecessary (it goes against Occam's razor) and bad for one's overall understanding of physics. This makes dualism scientifically empty because it does not make any testable predictions or mechanistic

explanations beyond the correlations that physicalism has already covered [8]. At the same time, it creates a “causal dangler” that doesn't have a clear position within a naturalistic framework.

6. Other approaches

Because both traditional physicalism and dualism have big problems, some philosophers have tried to find ways to avoid the usual conflict. Panpsychism offers a radical resolution to the hard problem by positing that consciousness is an inherent and omnipresent aspect of physical reality [9]. Elementary particles have basic properties, such as mass and spin. They might have a very basic kind of proto-consciousness or experience. This idea says that human consciousness does not just happen by itself from nonliving matter; rather, it comes from a huge, interconnected web of more basic mental traits. This resolves the intricate issue of raw emergence encountered by physicalism, as consciousness predated it, and it circumvents the interaction problem of dualism, given that mind and matter are two facets of a singular, fundamental reality from the outset. Nonetheless, panpsychism faces its own “combination problem”: how do the multitude of minute experiences, such as the fundamental sensations of electrons or quarks, integrate to create the complex, unified stream of consciousness of an individual or animal? The merging of minds into a new, more complex consciousness is just as mysterious as how consciousness comes into being from a state of non-being.

Daniel Dennett and Keith Frankish are two philosophers who support the radical idea of illusionism. It is more dismissive. This perspective posits that the hard problem is not an authentic dilemma but rather a cognitive illusion arising from inadequate folk-psychological frameworks. The intuitive sensation of an “inner movie” combined with “qualia” constitutes a user-illusion produced by the intricate operations of the brain. There is no additional information regarding the sensation of pain beyond its functional roles: nociceptive input, cognitive appraisal, and behavioral responses such as wincing, along with the verbal expression “that hurts!” After elucidating all functions and behaviors, this paper has exhausted all explanations; the concept of an additional, ineffable qualitative attribute poses a philosophical dilemma. Although parsimonious, illusionism is deeply paradoxical, presenting a theory that seemingly contradicts the very data—the authenticity of one's own experiences—it claims to elucidate. It seems more like a way to deny the existence of the awareness enigma than a way to solve it [10, 11].

7. Conclusion

The conflict between physicalism and dualism persists at a significant impasse, highlighting the distinctive nature of consciousness as the singular phenomenon people profoundly comprehend yet cannot objectively observe. Physicalism is a better way to do things because it fits perfectly with the naturalistic view of modern science and gives a strong structure for empirical research. There is no doubt that there are brain correlations, and there is no doubt that cognitive neuroscience is making progress. But it doesn't work at the end because it does not explain how and why objective, quantitative processes lead to subjective, qualitative experiences in their current form. The explanatory gap endures as an insurmountable divide that contemporary physical theories, notwithstanding their descriptive efficacy, are unable to transcend. On the other hand, dualism accepts the inherent nature of subjective experience and addresses the hard problem by proposing a fundamental, non-physical dimension of reality. It recognizes the deep feeling that there is something about being human that can't be explained in a physics book. However, this improvement in understanding comes at a high cost, making the interaction problem more complicated and

making it impossible to test and predict scientifically. The best way to deal with this problem might not be to fully agree with what one thinks now, but to accept that one's understanding of both the "physical" and "mental" worlds could be very wrong. Quantum mechanics necessitated a profound reevaluation of reality that contradicted classical intuition; similarly, a nascent theory of consciousness may demand an analogous disruption, fundamentally transforming the discourse and exposing the hard problem as a manifestation of human's conceptual constraints. The question of whether consciousness can be fully elucidated by physical science constitutes the most intriguing unresolved inquiry in human exploration. The physicalist possesses the evidence, whereas the dualist upholds the inquiry; indeed, the inquiry itself—the enigmatic, irrefutable essence of inner illumination—may constitute the paramount proof.

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