

Consciousness (Response to the Hard Problem)

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Consciousness has an extensive history in human understanding of the self and the world. The word “consciousness” comes from Latin *conscientia*, literally meaning shared knowledge. Consciousness has been a research topic in fields of philosophy of mind, psychology, neuroscience, and cognitive science. In general, it can be described as a characteristic of the mind, including qualities such as subjectivity, self-awareness, and perception between the self and the world. It has been argued that John Locke was the first philosopher to define consciousness in modern terms in his famous *Essay Concerning Human Understanding*, although Rene Descartes was arguably the first philosopher to use it outside of the traditional scopes of understanding.

Among recent empirical findings on consciousness is an experimental investigation in which perception changes independently of the stimulus. Logothesis and his colleagues (Logothesis 1998) trained monkeys to pull different levers for different patterns, while monitoring the ongoing neural activity in monkeys’ visual system. When different patterns were presented to different eyes simultaneously, monkeys kept switching back and forth between the two levers even though the sensory input remained the same. In the lower visual areas 80% of the neurons did not shift with the percept, but further along the occipital-temporal pathway 90% shifted with the percept. This indicates that the occipital-temporal pathway (ventral stream) largely serves as the neural basis of visual consciousness. These findings were further extended and redefined using modern brain imaging technologies. Impressive correlations between neural activation and indications of perceptual experiences have been established by Kanwisher (2001). These neural correlates are all found in the ventral stream, signifying the identification of the neural basis of visual consciousness in the ventral stream.

An ongoing question for debate in empirical findings is if the difference between conscious and unconscious activation of the ventral pathway is just a matter of the degree of activation. Kanwisher (2001) proposes that, based on the evidence from ERP (Event-Related Potential) studies using the attentional blink paradigm, that neural activation of meaning is no less when the word is blinked than when it isn’t, suggesting that it is not lower neural activation strength that

accounts for lack of awareness. The ERP studies support the idea that the difference between conscious and unconscious activation is a matter of neural synchrony at fine timescales. Another idea is that the difference between seen and “unseen” (seen but not attended to) stimuli might be a matter of interaction between the classic visual stream and the areas of parietal and frontal cortex that control attention.

Consciousness can be divided into access and phenomenal. Access consciousness has to do with access of information in our minds for verbal purposes, reasoning, or behavioral control. When we perceive, introspect, or remember something it is all workings of Access consciousness. Phenomenal part deals with experience itself – sensations, colors and colored forms, emotions and feelings. In 1996 Chalmers formulated the Hard Problem, which deals with the issue of “how to explain consciousness in terms of its neurological basis” (Block). An easy problem, as opposed to the Hard Problem, would concern the function of consciousness. The Hard Problem was identified by Nagel (1974) and further analyzed in Levine (1983) (Block). Thomas Nagel proposed the idea that consciousness and subjective experience cannot be reduced to brain activity. This position is discussed in his most famous article “What is it like to be a bat?” published in 1974 in *The Philosophical Review*. “I believe that there is a necessary connection in both directions between the physical and the mental, but that it cannot be discovered a priori” (Nagel).

There are various perspectives on consciousness, and particularly on the Hard Problem. Among those are Eliminativism, Philosophical Reductionism (Deflationism), Phenomenal Realism (Inflationism), and Dualistic Naturalism. Eliminativism deals with the view that consciousness does not exist (Dennett 1979; Rey 1997), thus there is nothing for the Hard Problem to be about. Deflationism moves closer to common sense by allowing consciousness to exist and it can be conceptually analyzed in non-phenomenal terms, based on behavior, functional, representational, and cognitive analyses. Inflationism views consciousness as a substantial property that cannot be conceptually reduced in non-phenomenal terms, which is compatible with empirical scientific reduction to neurological or computational properties of the brain. The Dualistic Naturalism view proposes that there are naturalistic alternatives to Cartesian dualism – a deeper level of reality that is the naturalistic basis of both consciousness and neuroscience.

The questions that the Hard Problem asks are: how could one property be both phenomenal property and cortico-thalamic oscillation; and how is it possible for something subjective to be something objective – first person vs. third person. The Thalamus is a relay station between sensory input and the cerebral cortex. The inputs are processed by the thalamus, and “converted” into a cortex readable format. The strong bond that the thalamus shares with the cerebral cortex is

expressed by the thalamo-cortico-thalamic circuits, and it is these circuits that are believed to be involved in consciousness.

There are two points of view as to how consciousness relates to the brain. The first one is that a phenomenal property is a neural property; the second is that a phenomenal property has a neural basis. The first claim would be a Deflationist position, while the second is an Inflationist or a Dualistic Naturalist position. Essentially, the first claim says that there is nothing about consciousness that cannot be explained using non-phenomenal terms, for example – biological or neurological terms. The second claim is saying that there is a certain neural basis to consciousness, but that neural basis does not explain consciousness in its entirety. As stated by Block (2004), there are two reasons for thinking that the Hard Problem has no solution – actual and principled failure. The actual failure is that no one has been able to think of even a highly speculative answer to the Hard Problem; the principled failure is that the materials we have available seem ill suited to providing an answer. Nagel stated that an answer to the Hard Problem would seem to require an objective account that necessarily leaves out the subjectivity of what it is trying to explain. The claim that a phenomenal property is a neural property seems more mysterious than the claim that a phenomenal property has a certain neural basis. In his paper, *The Problem of Consciousness*, McGinn (1991) notes that neural phenomenal are spatial, although at first phenomenal appears to be non-spatial.

The rest of this paper is going to propose a new model for consciousness, attempting to explain how it interacts with the brain as well as provide a possible answer to the Hard Problem.

Arguably, every individual with a mind and a body exists in at least two realities – physical and mental. Physical reality is objective, while mental reality is subjective. The basis for stating that both, physical and mental, are realities is the fact that both influence one's behavior as well as one's thoughts. For example, damage to the brain or the spinal cord will result in severe alterations of one's behavior, which signifies the physical reality. If one suffers from a mental degenerative disorder, such as Alzheimer's disease, it will heavily affect the otherwise normal behavior, which signifies the reality of the mental world inside the physical world. Consider an individual that has undergone some very bad emotional experience. This experience will shape the mental reality, and further alter the behavior in order to prevent such an experience to occur again. This illustrates the reality of the physical world inside the mental world. While thinking about the experience, one may come to a deeper understanding of the matters that surround the situation, getting a greater insight that otherwise was not achievable via physical manipulations. Such mental manipulations signify the mental reality.

The relationship between the physical and the mental is reciprocal. From physical experiences we learn and obtain new sensations. These experiences are then analyzed by the mind, further facilitating understanding of matters involved in such an experience. Deeper and more profound understanding of a particular matter, especially a social one, results in alterations of behavior that can avoid a lot of potentially awkward or even dangerous situations. If a dangerous situation is avoided in the physical world, the result is once again mentally processed. Such an experience can be a rewarding one, as one was able to avoid danger by simply thinking of matters beforehand.

The mind can be divided into three components – conscious, subconscious, and unconscious. The conscious mind is the mind that executes various cognitive and self-regulating processes; subconscious is the support mind – purely mechanical and without awareness; the unconscious mind is simply the conscious mind that has been shut off. Conscious and subconscious are the two minds of interest in establishing this model, suggesting that the conscious mind resides in the pre-frontal cortex, while the subconscious mind is the rest of the brain.

The pre-frontal cortex is responsible for a wide variety of cognitive processes, such as thinking, decision making, and executive functions. The executive functions include differentiation among conflicting thoughts, good and bad, better and best, same and different, as well as consequences of actions and activities, prediction of outcomes and expectations, and socially-acceptable control. Depending on the degree of damage to the pre-frontal cortex, severe alterations to personality will occur. A classic case of Phineas Gage illustrates such an issue. Another example is a psychosurgical procedure called lobotomy. It consists of cutting the connections to and from, or simply destroying, the pre-frontal cortex. This procedure often results in major personality change, or even mental retardation, and was used in the past to treat such disorders as schizophrenia, clinical depression, and various anxiety disorders.

The rest of the brain, the subconscious mind, carries out mechanical procedures, such as remembering, and perceptual and motor functions. The parietal lobe allows us to maneuver our balance; occipital lobe allows us to see; temporal lobes store memories. Damage to the inferior parietal and frontal lobes has long been known to cause visual extinction in which subjects appear to lose subjective experience of certain stimuli on one side of the visual field. Kanwisher (2001) found that the very same ventral stream pathways are activated regardless of whether conscious processing is present or not. Stimulus of which the subject may not be aware is still being processed by the brain. This illustrates the “meaningless” (without consciously-attributed meaning) functional purposes of the subconscious mind.

Phenomenality is a functional property of consciousness. To draw an analogy, seeing is a functional property of the occipital lobe. Phenomenality, then, is the result of conscious processes that have a particular neural basis, just like seeing has a particular neural basis in the occipital lobe. It can be defined as a particular kind of organization or comparative process that includes inquisitive conceptual thinking, based on past experiences, to understand or “make sense” of the given input. Inquisitive conceptual thinking means thinking that includes application of known concepts to inquire deeper into the presented stimuli, in other words – to attribute a meaning to the situation. For example, if your friend is waving at you, the presented stimulus is the waving. It takes inquisitive conceptual thinking to realize that the concept of waving is a form of communication, from which you can inquire that your friend wants you to come over. Phenomenality intertwines with epistemology – the study of knowledge. Just as knowledge can be defined in neurological terms, suggesting that there is some storage of memories and concepts that are logically traversed to make inquiries, phenomenality can be defined neurologically by examining the neural structures in the pre-frontal cortex. This neurological definition, however, will not give an insight into the abstract understanding and meaning carried out by phenomenality, thus including only the physical reality component, but leaving out the mental reality one.

To create an abstract analogy that will illustrate the mental component, spatial properties of physical reality can be considered. The physical reality consists of three dimensions – x, y, and z. Each of these dimensions is at a 90 degree angle to each other one. To follow through with the analogy, the mental reality can be said to be another spatial dimension, which is also at 90 degrees to x, y, and z. This dimension is no longer a physical one, but a mental – parallel to physical – one. It is a subjective dimension, while the other three are objective. Just as a physical experience contains a spatial or a visual component, a mental experience may contain those as well. As a response to McGinn’s statement that phenomenal is non-spatial, I state that phenomenal, in fact, can be spatial, as well as visual and verbal. REM (Rapid-Eye Movement) during sleeping has been found to correlate with the experience of a dream. Dreams often contain spatial experiences of being somewhere, visual experiences of seeing people and objects, and verbal or otherwise communicative experiences. There is a neural basis for the phenomenality of these experiences, but it does not account for the meaning. In this, the answer to the first question of the Hard Problem emerges.

The neural activity, expressed as a cortico-thalamic oscillation, is just that in the physical reality, while the phenomenality of it is the subjective meaning that occurs in the mental reality. Both processes are parallel and are in conjunction with each other. The Thalamus, then, can be said to be a physical link between the two realities, implying that there is a mental link present as well. The study of the

mental link and the mental reality includes spiritual practices, such as Buddhism and shamanism. Spirit itself is another word for mind. Spirituality, then, is a systematic study of the mental reality, just as science is a systematic study of the physical reality.

Computationally, this model can be seen as computer hardware – the physical – and computer software – the mental. On a physical – neurological – level we see hardware; magnets and electrodes; chipsets and silicon. However, by simply looking at a particular computer’s hardware we can draw no conclusions about what is in the mind of that computer. We obtain no insight into the phenomenality that lies beyond. The phenomenality itself is expressed by the operating system and all the programs that run on it; virtual reality; internet. As in the analogy above, it can be said that the virtual reality spatially exists at a 90 degree angle to the physical reality.

To answer the second question of the Hard Problem, first- and third- person views need to be defined in terms of the subjective and objective. A first-person experience consists of a subjective interpretation or experience of some given events. The experience is personal, and means different things to different people, completely depending on individual phenomenality. In a third-person view there is an intermediate step between the first-person subjective interpretation of some events and the events themselves. The intermediate step is an outside body, or simply put – another individual, that possesses his or her own phenomenality. Third-person view is experienced when events are interpreted by an outside mind, followed by the interpretation being communicated verbally or otherwise. Thus the result, in the first-person view, is an interpretation of an interpretation. In terms of the subjective and objective, the definitions are as follows. First-person view is a subjective experience of an event; third-person view is an objective experience of a subjective experience of an event. To further illustrate the definition, consider an example:

I am looking at a table. My phenomenality subjectively interprets the object. It is my table, so all the past memories of me writing papers, playing computer games, and recording music are associated with it. I am receiving a first-person experience of the table. As you are reading this, you are experiencing my table in third-person. Your phenomenality is receiving an objective experience of my subjective experience with the table, followed by your personal subjective interpretation of what that table may be like. The above example illustrates how something first-personal can be something third-personal, thus answering the second question of the Hard Problem.

An inflationist dualistic naturalist position that this model takes is able to coherently illustrate the solution to both question of the Hard Problem, putting itself into the “highly-speculative answer” category. The mind is not a mysterious

matter; it is simply outside of the physical understanding. Buddhist monks have been burned alive while meditating by Mongolian invasions of Tibet; these same monks have been known to achieve levitation. Shamans are known as communicators with the spirit world, and as already established – spirit is the mind. Spiritual practices such as Buddhism and shamanism are merely mind exploration practices, which transcend the limits of the untrained mind. As stated by Nagel – there is a connection between the physical and the mental, but it cannot be known a priori. And indeed – the connection must be experienced and understood subjectively before it can be known.

References

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