

Whether a
relationship exists
between the mind
and the brain



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For centuries, philosophers and scientist have been trying to solve the problem of the mind-body (brain). The most prolific of the minds has wandered sleeplessly, trying to solve the mind-brain problem, yet, the mysteries behind our skulls remain hidden. This paper is an attempt to address the causality problem of the mind and the brain. Firstly, an overview over the philosophical theories will be done. Subsequently, evaluation of certain scientific findings which may hold the answer will be carried out. Finally, the essay will end with a conclusion about these findings.

Part of the problem is whether one, (the mind or the brain), could plausible exist given the existence of the other. If this is the case, how are they associated? Does a relationship exist or are they two distinct realms. Many philosophers and scientists have made an attempt to explain and resolve the mind-brain problem. Two major philosophical theories have been proposed as a solution; dualism and monism. Followers of the dualistic theory argue that there are two fundamental entities – mind and brain. The mind and the brain functions separately, without interchange. Conversely, monistic advocates, instead, argue that there is only one reality and the mind and the brain are formed from, or reducible to, the same ultimate substance or principle of being. The former, however, is hard to contradict and/or support scientifically and therefore is not popular amongst scientists and psychologists (Valentine, 1992). However, in recent years, a third explanation, pluralism, has emerged. Pluralism is a mix of both monism and dualism. It argues that there is one fundamental reality but it may display different aspect of the reality.

In order to evaluate whether a relationship exists between the mind and the brain in the first place, we need to know if what the mind is. One explanation of the concept of mind is (1) “conscious experience and (2) the system or program that governs behaviour” (Valentine, 1992, pp. 21). For the simplicity, we will consider consciousness as the definition of the mind. However, we need to first explain what consciousness is. In psychology, consciousness is defined as our relative awareness of ourselves and our environments. Additionally, it is subjective for an individual, has changeable intensity and we have a sense of ourselves and our consciousness (Passer & Smith, 2007). Consciousness has been studied using modern tools such as fMRI or PET. These studies have showed activation in several brain areas for a stimulus that is normally associated with a certain brain area (Dehaene & Naccache 2001; Haier et al., 1992). Global workspace theory suggests that the otherwise independent brain regions functions as network enabled by the consciousness (Baars, 2002; Baars, 1997). Additionally, observational studies have indicated that certain brain injuries (blindsight, visual agnosia) have resulted in the loss of aspects of consciousness (Goodale, 2000; Kentridge et al., 2004; Weiskrantz, 2002). If we then assume that the mind is conscious experience, does the mind control the brain or is the mind a result of neural activity? Libet, Gleason, Wright and Pearl (1983) found that neural activity precedes conscious experience of indenting to act (the so-called readiness potential, RP). In a replication of this study by Haggard and Eimer (1999), awareness of movement followed a later module of the RP, the lateralized readiness potential (LRP). LRP represents the neural activity over the motor cortex in the hemisphere that controls the opposite side of the body. Haggard and Eimer (1999) suggested that awareness of movement

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may arise from neural processes linked to the selection of an action to follow a certain goal. Additionally, part of the medial frontal cortex has been identified as being responsible for intentional actions. Conversely, Haggard & Libet (2001) note that the delay of conscious experience to the actual experience itself may be due to the P-centre phenomenon (Morton et al., 1976 c. f. Haggard & Libet, 2001)., which originally refers to that the perceived onset of a acoustic words delays its actual onset, and seems to be drawn by the centre of the word. It is argued that this can be equally applied to internal events as intentions might also be extended in time. Haggard & Libet (2001, pp. 7), argue that “ the earliest stages of that process could perhaps precede the LRP onset”. However, new findings on cellular memory may oppose the notion consciousness being located only in the brain. A Japanese research group showed that an amoeba learned the patterns of a series of shocks at regular intervals and accordingly changed its behaviour in anticipation of the next one to come. Remarkably, the memory stayed for hours, even then the shocks stopped. A single renewed shock after a “ silent” period left the plasmodia expecting another to follow in the same rhythm it learned earlier (Saigusa, Tero, Nakagaki & Kuramoto, 2008). Additionally, these amoebas could also negotiate mazes and solve simple puzzles (Nakagaki, Yamada, Tóth, 2000). The implications of these studies could go so far that it could be argued that consciousness may arise from some cellular or sub-cellular level of organization rather than nerve circuitry. There have been cases where organ receivers have unexplainably “ inherited” traits which were not there prior to the transplantations. Although these cases are arbitrary and vague and there may be several other

plausible explanations, the stories are interesting and may lead to some serious scientific investigation at some point in the future.

On the other hand, conscious experience alone can not account for the mind as a majority of our behaviour also occur unconsciously. Jaynes (1986) listed several things such as, size, brightness, etc. that is preserved by our nervous system under widely varying environmental changes of light, distance etc. Additionally, consciousness is not necessary for learning. Conditioning, for example, is often subtly induced by some stimuli without our awareness. In fact, being conscious during conditioning hinders the effect of it once we are aware of the eventuality (Razran, 1971 c. f. Jaynes, 1986). If we, instead, discuss the concept of mind in terms of “ a system or program that governs behaviour” (Valentine, 1993, chapter 3, pp. 20), the mind can be attributed a totally different role. It is established that the frontal lobes has a major role in our personality. The prefrontal cortex has a superior role in the neuropsychological system. It has access to a vast amount of information that is stored and is processing in the brain. Additionally, it is able to directly and indirectly control activation of the cerebral resources. In particular, the dorsolateral region of the prefrontal cortex has been identified as being responsible for coordination, psychological control and executive functions. The motor and sensory network is closely weaved together with the area, which enables it to have full access to information about the condition of the own body and the surrounding world as well as having the opportunity to integrate with the environment. It has also a close relationship to the orbital cortex, which is associated with our thoughts, decision-making and behaviour influenced by emotional and social values of situations as it has a

high number of interconnections with the limbic system. Damage to the dorsolateral region is characterized by loss of the ability to take initiative, psychological independence and integrity. The patient becomes passive, impulsive and aimless. She is not able to mobilize and orient attention or thoughts in an organized manner. However, as prefrontal cortex is highly complicated, it has been difficult to closely investigate exactly what sort of psychological work that bark area executes, which has made this part of the brain a riddle to be solved (Eriksson, 2001). Considering these facts and the fact that the dorsolateral cortex is highly situated in the hierarchy of the brain, it could be argued that the area is the place where the mind resides. In this sense, the mind is an extension and the “superior” of the brain. Evolutionary speaking, this would make sense. According to Paul MacLean, three distinct brains emerged successively in the course of evolution and co-inhabit the human skull. These are, in evolutionary-time order, reptile brain, limbic brain and the neo-cortex (Holden, 1979). These three parts do not operate independently of one another; rather, they have established numerous interconnections through which they influence another (Passer & Smith, 2007). In a similar way, the mind might somehow evolved in parallel with the neo-cortex. Nevertheless, in brain surgeries on monkeys showed bluntness in all of aspects of their emotion. Myers (c. f. Eriksson, 2001) noted the animal’s loss of noises, facial expressions and, general, all forms of communication. The animal, generally, suffers from hyperactivity, mutism and behaves like an automat. However, the idea that the prefrontal cortex is the seat of the mind lacks any real scientific support or research as it would be very difficult to determine how it is possible as the mind is a non-physical

substance. Yet, future minds, with the assistance of perhaps new and more advanced technology may find a way to tackle this issue.

In sum, we have first used consciousness as the definition of the mind and tried to address the relationship of consciousness to the brain. Scientific evidence has supported the notion of brain activity causing consciousness. However, these studies have had some methodological issues which need to be dealt with. Additionally, we have established that consciousness alone may not account for the mind as many of our processes also occur outside awareness. Instead, we have identified the prefrontal cortex as the seat of the mind. However, this is hard to prove and explain at present time. In conclusion, the sort of a problem the mind and brain is makes it difficult to construe and study scientifically as it is hard to conduct decent experiments on. For now, science needs to mature further in order to answer whether a relationship exists between the mind and the brain along with the direction of the relationship.