**Non-reductive Materialistic View of The Mind-body Problem**

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“I think, therefore I am” – René Descartes.

Once stated by one of the most influential philosophers in the history, Descartes, the only certain undoubtable property is the doubting soul itself. Descartes concludes that the human soul is an immaterial entity, detached from the physical world. Thereby the wise philosopher stumbled upon a problem that remains unsolved - the problem of mind and body, the interactive relationship between the mind and the body or more specifically, the brain. At present time two approaches to the problem are relevant due to the growth of neuroimaging technology, the visual illustration of brain activity. Namely, reductive and non-reductive materialism. The reductionist approach holds that the mind is simply a by-product of mere biological processes located in the brain. On the contrary, non-reductive materialism holds that though mental properties are physically based, they could never be reduced to neutral states (Brysbaert & Rastle ,2009). Practically, recent cases in courts report the use neurological data to provide evidence for/against events of lying (Francken & Slorsb, 2018). Theoretically, the concept of the mind in psychology has been reduced increasingly as brain’s scan techniques develop, resulting in poor conceptualization of these brain scans as photographs of the mind (van der Linden, 2020). Taken together, the relevance of discussing the possible approach to the body mind problem is undeniably important to both science and society. This essay argues in favor of a non-reductive materialistic approach to the body mind problem by outlining the theoretical and practical issues as well as a framework to this problem.

Evidence of the influence of biological and physical forces on the mind, do not imply a literal location in the body. The mind has long known to be rooted in the physical world with the first concrete evidence discovered at the 18th century, when a railroad worker underwent vast personality changes following brain injuries to the frontal lobe (Jacob, 1850). This does not mean however, that a part of the human’s minds is *located* in the frontal lobe. To illustrate, Dennett (1992) conceptualized the mind as the centre of gravity of objects, explaining how the mind is tied to but not found in the brain. The centre of gravity of an object is the average location of the wight of an object, a central concept in Newtonian physics. Remarkably however, the centre of gravity, has no *real* existence. It is an abstractum. The centre of gravity is thus continuously changing by the physical properties of the object. There is merely a tight link between the *real* object and its centre of gravity, the *abstract.* Analogously, so are the body and mind connected. The mind is an umbrella of abstractums such as emotions, intelligence, cognition and more. Now, assume neurology finds the complete neural networks of the mind. Thereafter, scientists find the atoms and the chemical process through which the network operates. *This* is not the mind nor the consciousness, but an interpretation. In the same way physics *infers* the centre of gravity of an object, neurologists *infer* the mind based on chemical properties. An atom doesn’t constitute the centre of gravity of an object just as an atom doesn’t reflect mentality. While the mind is affected and rooted in the *real* world, it is and always will be, an abstractum.

The inability of science to rise subjective consciousness out of models of perception establishes the ultimate proof that the mind is grounded, but not found in the physical world. Modern sciences, as psychology, pursuit objectivity by means of methodology. Namely, reducing phenomena into defined parts studied in controlled environments, allowing neutral observations. Objectivity should therefore result in an unbiased concept that is “clean” from any subjectivity. This is not applicable to the subjective experience of a conscious being, the being’s qualia. Firstly, the mere assumption of consciousness means that there is something that is like to *be* conscious. To illustrate, let us use bats’ consciousness (Nagel, 1974). As bats’ brains process impulses in the form of echoic information, bats can discriminate *physical* properties such as shapes that alternate their response and conscious experience- comparable to humans’ visual perception. Consequently, in the event of scientifically studying bats’ qualia, a fundamental contradiction of subjectivity and objectivity occurs. No amount of study into the perceptual systems or the brains of bats will ever allow us the qualia, conscious experience, of a bat. At the most, humans, can merely study how it is like for *humans* (and NOT bats), to be bats. Imaging perceptual experience that we cannot produce is thus hopeless. This argument applies to the reductionist research into the mind, neuroimaging. Regardless of the extent to which science will ever be able to document the brain, by no means will it ever reflect the qualia of a human. Objective methodology can only lead to objective, and not subjective, understandings.

Neuroimaging does not produce pictures of the brain. Neither is it, as argued by reductionism, a reflection of mental components of the mind. This is due to three issues in the translation of a mental concept to a neuroimaging finding (Francken & Slorsb, 2018). To demonstrate let us use “memory” as an example. Firstly, the concept “memory” is translated from “common sense cognitive process” (CCC) to a “scientific cognitive concept” (SCC). SCC memory according to psychological theories, consists of three types: short, long and working memories. A notable loss is evident here. Compared to each component of the SCC memory alone, common sense memory covers significantly more sematic meaning. Furthermore, this reduction requires the *subjective* selection of a specific scientific theory, from which a specific definition is deduced. Next, assume the working memory (WM) is chosen as the SCC. Secondly, by experimental tasks, the neurological and the behavioural mechanisms of WM, are studied. The “Wisconsin card-sorting task” requires matching cards based on their physical properties such as colour, given feedback alone (Berg, 1948, cited in Francken & Slorsb, 2018). This task is used in neurological research for investigating both “task-switching” ability and WM. The question of which of the two abilities is measured, manifests an important complication in the translation of SCCs to cognitive tasks. The SCC is concluded from the behaviour and brain scans observed while solving the task. Neither abilities are reflected in the brain scans directly, but are interpreted *subjectively* by the researcher. If WA and “task switching” would indeed be two distinct constructs of the human mind, two different and observable activation patterns in the brain would be directly seen in brain scans with no need for interpretation. Thirdly, the selection of a brain imaging technique. The researcher chooses a method with which the brain is analysed. Problematically, different methodologies produce different conclusions. A striking example of this problem is findings of brain activity in a dead salmon fish, when certain analysis of fMRI scans was used (Bennet, Baird, Miller, & Wolflord, 2009). In sum, findings obtained by the end of this reductionist and subjective process, are (mis)used to supplement conclusions regarding the nature of mental concepts as memory, or more absurdly, regarding the human mind.

This essay offers a logical review of the conceptual and practical support for materialistic-non-reductive framework for the body mind problem. Firstly, the theoretical foundation to how the mind is simultaneously physical and non-reducible. Secondly, the theoretical contradiction between the subjectivity of the mind and the objectivity of science as support of the essay’s thesis. Lastly, the practical inability of neuroimaging to reflect mental concepts. Therefore, contribution is made to the theoretical view of the mind by science. The reasoning above additionally constructs a suitable scheme of conceptualization for the interaction between the mental and the physical. By providing critical evaluation of neuroimaging, future misuse of scientific findings in the public sector, such as in the justice system, is prevented. It is ultimately thus the method of doubt that is emphasized above all, assisting both Descartes and this essay’s author use to foster the philosophical and psychological view of the mind.

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