

Of the Human Brain, Mind, and Soul

Capstone 492H Term Paper

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May 1, 2001

Prepared in MLA Style

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The human mind and its relationship to the brain and the soul is a fascinating mystery, being the subject of considerable and popular debate. The brain could be understood to be a biological machine, preprogrammed at conception in the genetic code within the chromosomes. It is the organ within the human body that serves as a control center for all physical, cognitive, and emotional activities, and spontaneous processes in the body. Within the brain, chemicals are programmed within the genetic code to be secreted in specific amounts at specific times throughout the individual's lifetime. These chemicals act dependently or independently, initiating various reactions (signal transduction pathways, for example). We also know that certain environmental stimuli can (on a preprogrammed basis) elicit certain chemical responses, such as the hormone cortisol, which is closely related to stress and has been implicated in numerous diseases (Conlan, 84-5, & 114) & (Santrock, 498). According to J. Allan Hobson, Professor of Psychiatry and Director of the Laboratory of Neurophysiology at Harvard Medical School: "The living brain is always chemically modulated. Changes in neuromodulation are experienced by us as shifts in our mode of perceiving, thinking, and feeling" (Hobson, 55).

The mind could be understood to be a product of the brain's activities and the individual's environment. Environmental influence is as significant as genetic influence, or potentially more so. The mind encompasses the behavioral aspect of life by interpreting, evaluating, and sorting experiences, then eliciting a response to them. The environmental

influence includes learned behaviors, and social and cognitive development of an individual. In this sense, the mind is like an extension of the brain, because it goes beyond the brain's basic chemical functioning, yet it is still dependent upon it. It is the psychological component of a person, where the brain is the biological component. Together, the psychological and biological components make up the brain-mind complex.

The relationship between the brain-mind complex gives rise to the soul. The soul represents our free will, which I define as the opportunity to choose between what we know as right and wrong by engaging in the process of moral reasoning, the highest level of cognitive thought, along with altruism, the unselfish interest in helping others. Maturation of the soul varies between individuals as a result of unique life experiences, and also an individual's personal desire to grow spiritually and learn from mistakes. Additionally, the soul could be considered a functional capacity of a complex organism rather than a spiritual essence that inhabits the body. It includes the ability to have relationships with other people and with God.

This essay will concentrate on the strategies of nonreductive physicalism, dualism, and reductive materialism of understanding the brain, mind, and soul relationship of human beings.

The dualism perspective is the belief that the brain and mind are two separate entities, and the interaction between them is likened to that between a non-physical entity (the mind) and a physical entity (the brain). Sir John Eccles stated: "It is the interaction of brain and conscious mind, brain receiving from conscious mind in a willed action and in turn transmitting to mind in conscious experiences"(Murphy & Malony, 88). According to radical dualism "the soul (or mind) is separable from the body, and the person is identified with the former" (Murphy & Malony, 24).

A traditional, dualistic Christian belief is that by a special act of creation, humans are endowed with a separate entity which is the soul. It is believed that the soul has separate existence and potentially even a separate realm of awareness and agency. The benefit of this perspective is that it doesn't require a rational or scientific understanding of a soul and its activities because it supposedly exists in another realm. It is presumed that we have a soul, and our understanding of it is dependent upon our theological preferences. "Physical or psychological realities are not presumed to be relevant to our understanding of the soul, nor are they thought to affect the soul's status or well-being" (Murphy & Malony, 99).

The dualistic perspective is excessively simple and seems somewhat archaic. The concept of a soul is more complicated than this position suggests, and what purpose would it serve if it was completely separate from the brain and mind? It is more logical to understand it as an emergent property of these two, because it implies relatedness of the brain, mind, and soul.

Nonreductive physicalism is the understanding of the human as a physical organism whose complex functioning, both in society and in relation to God, gives rise to 'higher' human capacities such as emotion, morality, and spirituality. According to Nancey Murphy and H. Newton Malony, "the tightening of the link between the mind and the brain does not in any way minimize the importance of the mind or of mental activity in general. It does not mean that the mind is a mere epiphenomenon of the physical activity of the brain" (Murphy & Malony, 89). The mechanism by which brain activity is determined by the mind might be likened to the relationship of hardware and software in a computer. "Mental activity and behavior depend on the physically determinant operations of the brain, itself a physicochemical system. When that system goes wrong or is disordered, there are changes in its capabilities for

running the system that we describe as the mind or as mental activity” (Murphy & Malony, 89). Furthermore, if certain behaviors are resultant of mental activity, it may cause temporary or perpetual changes in the physicochemical character and activity of the brain. “Thus, this ever-tightening link does not minimize the importance of the mind or the brain in this unitary complex system”(Murphy & Malony, 89). “According to this view, we regard mental activity as *embodied in* brain activity rather than as being *identical with* brain activity” (Murphy & Malony, 89). A more contemporary perspective of the nonreductive physicalism strategy proposes that mental activity and correlated brain activity are inner and outer aspects of one elaborate set of events which comprise conscious human agency (Murphy & Malony, 89).

The soul is not considered an essence that is separate from the physical person, but it is the sum of experiences that humans relate to and commune with God, and with one another in such a way “that reaches deeply into the essence of our creaturely, historical, and communal selves” (Murphy & Malony, 101). It arises out of experiences of personal relatedness, which is considered an emergent property of certain critical cognitive capabilities. Capacities considered critical to possess personal relatedness are language, a theory of mind, episodic memory, conscious top-down agency, future orientation, and emotional modulation (Murphy & Malony, 103). Personal relatedness is defined as uniqueness in 1) subjective processes of self-relatedness and self-representation, 2) inter-individual relatedness, and 3) relatedness to God. “An emergent property is a unique mode of functioning that becomes possible on the basis of both a significant increase in the capacity of some number of lower-level abilities and the interaction among these capacities”(Murphy & Malony, 102).

The following statement captures top-down causality of nonreductive physicalism:

“Mental processes that operate at the level of the cognitive, psychological, and psychosocial determine the course of the neurophysiological systems that instantiate them” (Murphy & Malony, 102).

Nonreductive physicalism is a reasonable approach to understanding the brain, mind, and soul relationship because it demonstrates interconnectedness between the three. They work together to make up the physical and spiritual person. These individual aspects cannot function completely on an independent basis. Malcolm Jeeves, Research Professor of Psychology at the Univ. of St. Andrews made a statement that supports this concept: “Few neuroscientists any longer believe that humans are composed of two distinct and separable parts, called brain and mind, or body and soul. With every neuroscience advance comes further confirmation of the inseparable bond between brain and mind” (Stannard, 131). From a theological perspective, it isn’t logical for the brain-mind complex and the soul to function separately.

The reductive/materialism perspective is atheistic and doesn’t recognize the soul as something separate. Sometimes referred to as a “pack of neurons” theory, the reductive/materialistic perspective views the person as a physical organism, whose emotional, moral, and religious experiences will all ultimately be explained by the physical sciences. There is no human distinctiveness with the unique possession of a soul or immaterial mind. Their belief is based on the idea that natural explanations are preferable to supernatural ones “because natural explanations produce more understanding than supernatural ones” (Schick, 1). The value of an explanation is determined by how much understanding it exhibits, and the amount of understanding produced by an explanation is measured by how well it classifies and unifies our knowledge. The extent to which an explanation classifies and unifies our knowledge can be

measured by different criteria of adequacy such as simplicity, scope, conservatism (a fit with an existing theory), and the ability to make successful novel predictions (Schick, 2).

“Supernatural explanations are inherently inferior to natural ones because they do not meet the criteria of adequacy as well” (Schick, 2). If there is no plausible natural explanation for some phenomena, it cannot be justified by the claim that God caused it. The inability to provide a natural explanation may simply be due to our ignorance of the operative natural forces (Schick, 2).

Peter Atkins stated: “Somewhere on the borderline between the invented and the real lies the question of the human spirit and its associated qualities, such as love and aesthetic appreciation” (Atkins, 2). He admitted that these “qualities, or at least their physiological appurtenances, exist” (Atkins, 2). He believes that the question is whether or not science can elucidate them, and quickly supports this with his idea that there is no evidence that science cannot (elucidate them). He described love as a complex emotion, that involves genetically controlled responses, hormonal excretions, and intellectual reflections and considerations (Atkins, 2). His most interesting statement was “Science can elucidate such a condition, even though it will probably never purport to be able to predict whether one individual will fall in love with another” (Atkins, 2).

Materialist/reductionists like Daniel C. Dennett, “hold that consciousness and will are wholly due to material” (Beardsley 1996), and the material is designed by evolution (or people) to serve useful functions. Dennett says consciousness is created by a ‘virtual machine’ in the brain. He also sees beliefs as virtual properties of brains similar to software in a computer (Beardsley, 1996).

The reductive/materialistic approach is, in a word, arrogant. Their beliefs are no more valid or superior than any theistic perspective and they are definitely irrational. If human beings really could solve their own problems, they probably wouldn't have so many of them to deal with. One of the humanistic (a.k.a.: materialistic) affirmations is the commitment to the application of reason and science to the understanding of the universe and to the solving of human problems. We can understand our universe only to the capacity that our human minds can comprehend. If one thinks about this, particularly from the perspective of modern physics, that affirmation is unrealistic. We understand our universe only in a language that describes our world as we know it, based on our experiences. This means that at the quantum level, for example, our language is inadequate to describe modern physics because it exists outside of our experiences. The only way to describe modern physics is in terms of mathematics. Activity at the quantum level is not like that of things we are used to seeing and describing in our usual language. We cannot even begin to describe this behavior, and we may never be able to. What this means in terms of understanding the brain, mind, and soul is that we may not be able to understand this relationship relative to our humanly experiences. I think this idea is most profound in Peter Atkins' admission of never being able to elucidate the prediction of whether individuals will fall in love. Additionally, reason and science to date hasn't successfully solved many human problems. They have made our lives different and more comfortable in a lot of ways. For example, antibiotics are a revolution in medicine, but there are now antibiotic resistant bacteria. Problems don't really go away, they repeat themselves or they appear in different forms. It seems that there must be some higher purpose to these struggles in life and a message implied: we are only human.

The nonreductive physicalism perspective is a contemporary strategy to understand the relationship of the brain, mind, and soul. It is a rational approach that implies relatedness of these three components. In conclusion, I am including some recent studies on the brain/mind of elderly persons and their behavior that illustrate the relatedness of the brain and mind.

“A significant aspect of the brain is that neurons no longer replace themselves” (Santrock, 490). However, the brain continues to have a remarkable capacity to repair itself, thereby losing but a small amount of its’ functional abilities in late adulthood years. One investigation illustrated the adaptive nature of the brain. It was found that growth of dendrites increased in the age bracket from the forties through the seventies. “Dendrites are the receiving part of the neuron or nerve cell. They are especially important because they make up approximately 95 percent of the neuron’s surface. But in very old people, (in their nineties) dendritic growth was no longer taking place”(Santrock, 490). Therefore, dendritic growth might compensate for neuron loss through the seventies, but not when individuals reach their nineties. Lack of dendritic growth in the elderly may be due to a lack of environmental stimulation” (Santrock, 490). A study completed by Stanley Rapaport (1994), chief of the neurosciences laboratory at the National Institute of Aging, compared the brains of younger and older individuals who engaged in the same tasks. The older brains literally rewired themselves to compensate for losses. If one neuron couldn’t do the work, neighboring neurons compensated for it. It was concluded that as brains age, task responsibilities can be shifted from one region to another (Santrock, 491). Another ongoing study of the brain is being conducted on approximately 700 nuns in a convent in Mankato, MN. Examination of the donated brains, along with some others, suggests that the brain has a “remarkable capacity to change and grow, even in old age” (Santrock, 491). “The

Sisters of Notre Dame in Mankato lead an intellectually challenging life, and brain researchers recently have found that stimulating the brain with mental exercises may cause neurons to increase their dendritic branching” (Santrock, 491). These examples demonstrate that the brain and mind function together, rather than independently.

Another study which was completed on nursing home residents illustrated the importance of the patient’s feelings of control and self-determination as a factor related to health, and even survival. In this study, a group of elderly nursing home residents were encouraged to make more day-to-day choices and thus feel they had more responsibility for and control over their lives. They were able to choose what they ate, when visitors could come, what movies they watched, and who would visit them. A similar group in the same nursing home was assured by the administrator how caring the nursing home was and how much the staff wanted to help them, but they were given no options for control over their lives. After eighteen months, the residents who had responsibility and control were happier than the group who was reassured of care. They also showed “significantly better improvement in their health than did the ‘dependent’ group” (Santrock, 498). The most significant finding was that after 18 months only half as many nursing home residents in the ‘responsibility’ group had died as in the ‘dependent’ group. Perceived control over one’s environment may literally be a matter of life or death.

Judith Rodin (1990) says that individuals who perceive an increased sense of control are more likely to feel that their actions can make a difference in their lives. Consequently, they are more apt to take better care of themselves by incorporating a healthy diet and participating in exercise. Those who feel a reduced sense of control are likely to feel that what they do will not make a difference and won’t bother to try. Additionally, it is believed that “the perception of

control can have a direct effect on the body. For example, being in control reduces stress and its stress-related hormones. When stress-related hormones remain elevated, there is more wear and tear on the body. High blood pressure, heart disease, arthritis, and certain types of ulcers have all been linked with excessive stress” (Santrock, 498). This research is a strong illustration of the relatedness of the brain and the mind and it suggests that they are dependent upon each other.

Finally, studies on religion in old age indicated that religious practices, including prayer and scripture reading, and religious feelings were associated with a sense of well-being, especially for women and individuals over the age of 75. Additionally, there are other studies that relate higher self-esteem in older adults with a strong religious commitment. Religion is known to provide some important psychological needs in older adults, such as dealing with impending death, finding and maintaining a sense of meaningfulness and significance in life, and accepting the losses associated with old age. The religious community provides a social environment for older adults and an opportunity to help and teach others, which gives the individual a sense of purpose.

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