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Letter to the Editor
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Insufficiency of Neuroscientific Data to Determine a Theory of Religious Experience

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Letter to the Editor

In the new interdisciplinary research program named neurotheology, researchers are trying to explain religious experiences by employing neuroscience. They believe that neural processes within the brain are the cause of religious experiences. Two competing approaches are presented in this program. The first approach, with an empathetic view on the reality of religious experience, focuses on the brain images during praying to explain religious experiences by neural changing. The second approach, seeks to show that religious experiences are the result of dysfunction of the neural system, therefore one can count them as illusions. In the following, we first shed light on each of these approaches and then argue that the scientific data is insufficient to reach the goal of these two approaches. In other words, it is the interpretation of the experimenter or test subjects that determines whether the religious experiences are illusions or imply an external truth.

Andrew Newberg has provided brain scans of Franciscan nuns, Buddhist practitioners and Pentecostal practitioners while they worship and meditate [1]. Based on the results of his researches, he believes that, first each part of the brain constructs a different perception of God. Second, every human brain uniquely reconstructs its perception of God [1].

One of the significant properties that he emphasizes to justify the formation of spiritual concepts in the brain is the property of "neuroplasticity", which is related to flexibility and the capability of extensive changes in the path of synapses. Newberg shows that different types of worship affect different parts of the brain. However, based on brain scans, the most important areas that are active in most worshipers are the frontal lobe (especially the prefrontal part) and the parietal lobe (Figure 1) [1].

The second approach in neurotheology uses data of neuroscience to argue against theism. Proponents of this view contend that there is no such thing as a religious experience but some disturbing images are produced in unhealthy brain. For example, epileptic patients sometimes think that they have direct communication with God and perceiving His presence. It has also been shown that decreased oxygen and glucose in the brain changes the conscious state and creates a feeling similar to religious experiences. In another example, Michael Persinger invented a device that stimulated the temporal lobe and caused a sense of spiritual experiences in the subjects [2]. This device is known as the "God Helmet".

Here we rise a specific critique about the latter approach. In neuroscience, the fact that stimulation of some neurons causes pain, cannot guarantee that there is no external cause for the pain. Based on the maps that Wilder Penfield discover on the cortex, now we know which point on the cortex is responsible for (for example) the little finger. So, when experimenter stimulates that point, the subject feels it on her finger. According to this fact, however, no one concludes that the finger's pain is impossible that is caused by things outside the brain. In other words, the fact that we can create pain through manipulating the brain does not imply that all sort of pain is an illusion. In addition to pain, we can employ this reason for mental images as well. Thus, when the stimulation of a brain part creates a state similar to religious experiences, it cannot be concluded that no external factor has an effect on the creation of religious experiences.

Furthermore, there is a fundamental drawback to both approaches in order to clarify this drawback, we should introduce the concept of "under determination" in the philosophy of science. Under determination means that empirical data are sometimes insufficient to select a scientific theory among several competing theories [3]. Suppose O_1, O_2, O_3 are observational data, and T1 and T2 are two scientific theories that are both equally successful in explaining those data. Here choosing

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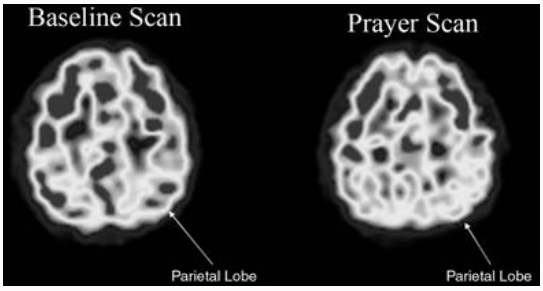

Figure 1: Brain scan of a nun at rest and during prayer showing decreased activity in the parietal lobe that may be associated with the loss of the sense of self.

one theory among T1, T2, either requires more data or requires subjective selection. The typical example in the history of science is the choice between central earth theory of Ptolemy and central sun theory of Copernicus. They were theoretically rivaling for about 150 years so that their prediction of planets motion and time of eclipses were almost equally accurate. It was after this period that, with the invention of the telescope and the addition of further observations, Copernicus' theory prevailed over Ptolemy's theory.

Here, too, Newberg and Persinger both use data from brain images but draw conflicted results. So this data is not enough to provide a complete theory of religious experience. It is often up to the experimenter or test subject to interpret images or interpret the state of consciousness. This interpretation is more influenced by the ethnicity, culture, and underlying beliefs of the test subject than by a signal or a chemical drug composition. Therefore, the feeling of God's presence or the rejection of God's existence, based solely on neuroscience data is a type of question-begging fallacies.

The different interpretations mentioned above have been identified in experiments. For example, Franciscan nuns report the experience of nearness to God, and Tibetan monks report the experience of oneness with God in their worship, while the same areas in their brain were active during worship [4].

These cases show that neural correlation in religious experiences cannot be considered as the cause of these experiences.

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