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Christianity and Fear: The Neuropsychological Processes Involved in the Relationship Between Fear and Religion

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ABSTRACT:

Religion frames the lives and minds of individuals who practice the Christian faith. Regarding the mind, this statement can be understood both figuratively and literally. The thought processes of human beings who claim to believe in God are strongly influenced by their perspective of Deity and what they think God's primary characteristic is. While some view God as loving, others view God as mainly angry and punishing. The way this question is answered by an individual reveals much about his or her neurocircuitry and which brain structures are most active and developed. These circuits and structures then impact the behaviors and responses of the individual, especially in dealing with tasks that involve religious undertones.

Christianity and Fear

The Neuropsychological Processes Involved in the Relationship Between Fear and Religion

by Courtney (Welch) Horstman

Religion has been an integral part of human society since the beginning of time. It impacts the way people live, the way they relate to one another, and the way they think about the world and their own lives. Although religion is largely a qualitative component of the human psyche, it can be analyzed and understood through the means of neuroscience. Studies in the field of neuropsychology have revealed patterns of neural circuitry and elements of brain structures that are associated with one's perceptions of Deity. Specifically, these studies have addressed the issue of fear in Christianity. Is God an all-loving and compassionate being? Is God an angry being, seeking to punish and harm humanity for its wrongs? These are vital questions each individual member of the Christian faith must answer, and the answer given has a significant impact on how the brain wires itself and how it responds to mistakes and temptations.

BRAIN STRUCTURES RELATED TO LOVE AND FEAR

Fear is the emotional response triggered by the potential risk for harm or danger.[1] There are specific structures in the brain that contribute to an individual's psychological experience of fear. The structures that are strengthened when fear circuits are activated are developed at the expense of the development of the Anterior Cingulate Cortex (ACC), the brain structure whose primary functions are to make judgements and formulate the emotions of empathy, love, and compassion.[2] Within the mind of a Christian, the question of God's primary characteristics influences the amount of gray matter within each of these structures. The greater the fear, the greater the development of the amygdala. The greater the love involved in one's perspective of God, the greater the development of the Anterior Cingulate Cortex.[3]

The Anterior Cingulate Cortex (ACC)

The Anterior Cingulate Cortex (ACC) of the brain is revered as the "neurological heart" of an individual.[4] This is the structure in which the brain reviews both emotions and judgement and is then able to respond with an informed decision. This gives the ACC an important role in the regulation of emotions and in the controlling of anxiety.[5] It is the juncture point between the limbic system and the brain structures involved in judgement, which are the Dorsolateral Prefrontal Cortex (DLPFC), the Orbitofrontal Cortex (OFC), and/or the Ventromedial Prefrontal Cortex (VMPFC).[6] This structure holds an individual's capacity for empathy and compassion, allowing him or her to see beyond self-preservation. The ACC also deals with morality and justice, which gives an individual his or her sense of right and wrong.[7]

1 Esperidião-Antonio, V., Majeski-Colombo, M., Toledo-Monteverde, D., Moraes-Martins, G., Fernandes, J. J., de Assis, M. B.,…Siqueira-Batista, R. (2017). Neurobiology of emotions: An update. *International Review of Psychiatry, 29*(3), 293-307. Doi: http://dx.doi.org.go.asbury.edu/10.1080/09540261.2017.1285983

2 Jennings, T. R. (2013). The god-shaped brain: How changing your view of God transforms your life. Downers Grove, IL: InterVarsity Press.

3 Ibid. 38 & 54

4 Ibid. 38

5 Inzlicht, M., Mcgregor, I., Hirsh, J. B., & Nash, K. (2009). Neural markers of religious conviction. *Psychological Science, 20*(3), 385-392. Doi: http://dx.doi.org/10.1111/j.1467-9280.2009.02305.x

6 Jennings 38

7 Ibid. 38

The Amygdala

The Amygdala is the fear center of the brain. In the face of danger, the Amygdala triggers the "fight or flight" response.[8] It is also activated by emotionally significant stimuli, along with emotional learning and memories.[9] This brain structure sends signals throughout the body and reinforces the idea that one's environment is not safe. For those whose religion is fear-based, the Amygdala is activated upon thoughts of God and of God's characteristics.[10]

The ACC and Religion

Through a study that was published in 2009, psychologists Michael Inzlicht, Ian Mcgregor, Jacob B. Hirsh, and Kyle Nash sought to understand the relationship between religion and the Anterior Cingulate Cortex.[11] Throughout their experiment, which involved twenty-eight participants completing several religion-themed questionnaires and an Electrophysiological test, the level of error-related negativity (ERN) was measured. ERN indicates the intensity of negative emotions that result after a mistake is made, and it is a neural signal produced in the ACC. The participants who scored as being more religiously zealous compared to the rest of the sample actually had lower levels of ERN activity in the ACC, which indicates an increase in positivity.[12] This study reveals the effects religious beliefs can have on neurological firing within the brain, along with the strong connection between the Anterior Cingulate Cortex and an individual's perspective of religion.

THE FORMATION, EXTINCTION, AND RESTORATION OF NEURAL PATHWAYS

The thought patterns of individuals have stood the test of time because they are, evidently, patterns. Neural circuitry is strengthened upon activation and deteriorates upon neglect.[13] The agents involved in this phenomenon are the proteins Brain-Derived Neurotrophic Factor (BDNF) and Pro-Brain-Derived Neurotrophic Factor (ProBDNF). The brain's ability to be resilient and undergo this process of growing and pruning neural circuits is called neuroplasticity.

8 Ibid. 54-56
9 Esperidião-Antonio et al. 298-299
10 Jennings 63-69
11 Inzlicht, Mcgregor, Hirsh, & Nash 385-392
12 Ibid. 387
13 Jennings 55-56

Brain-Derived Neurotrophic Factor (BDNF)

In his book *The God-Shaped Brain*, T.R. Jennings uses the analogy of Brain-Derived Neurotrophic Factor as a "fertilizer" for the brain.[14] The etymology of Brain-Derived Neurotrophic Factor reveals that it is a protein factor made by the brain for the purpose of strengthening neurons.[15] It also increases neural circuit connections and improves the learning ability of the brain.

ProBDNF

ProBDNF is an uncleaved version of BDNF, and, rather than promote the growth of neurons, ProBDNF can cause fatal damage to neural structures of the brain.[16] Although this characteristic may be understood in a negative light, such as ProBDNF being the cause of dementia or simply the reason one does not remember something learned during elementary school, ProBDNF can be helpful in the unlearning of fear. It provides a source of hope for those who recognize their thought patterns as being unhealthy and destructive, especially regarding one's thoughts and perspective of Deity.

Neuroplasticity

Neuroplasticity is considered the saving grace of the brain. It is the brain's ability to form and reconstruct its neurocircuitry; it is the resiliency component that allows the brain to recover from damage or unhealthy neural circuits.[17] By working with BDNF and ProBDNF, the brain is able to heal itself from neuroticism, from addiction, from fear circuits associated with religion and one's view of God, and more. In addition to unraveling these unhealthy circuits of distorted perspectives, the brain has the capacity to rewire itself and formulate healthy circuits that promote compassion, empathy, and a view of God that is built upon love and is free of fear.

NEURAL ACTIVATION AND RELIGION

Psychologists Marie Good, Michael Inzlicht, and Michael J. Larson recently conducted a study in order to test the neurological effects of making mistakes

14 Ibid. 55
15 Ibid. 55
16 Ibid. 55-56
17 Ibid. 55-56

in light of one's perspective of God.[18] In this study that was published in 2015, 108 students from Brigham Young University were put into three experimental groups. The first group meditated on God's love, the second group meditated on God's punishment, and the third group, in order to make distinctions between a focus on love (as in the first group) vs. other positives in regard to one's relationship with God (i.e., relief from anxiety), meditated on the idea of religion being a source of peace. Essentially, the third group served as a comparison group. The purpose of this experiment was to determine whether or not one's impression of God primarily as loving or as punishing would impact an individual's neurological response to "religious" mistakes.[19]

Error-Related Negativity (ERN)

Similar to the first study discussed, the effect observed within these experimental groups was error-related negativity (ERN). ERN is a neural signal from the Anterior Cingulate Cortex that indicates emotional responses to mistakes, along with one's performance monitoring.[20] The higher the ERN after an error, the higher the intensity of emotional response within the brain.

God's Love vs God's Punishment

The group that focused on God's love in the experiment resulted in having lower levels of ERN upon making mistakes on the task at hand, which had strongly religious themes. This decrease in ERN indicates a lesser amount of anxiety as well, for anxiety levels are strongly influenced by the ACC.[21] By contrast, those who focused on God's punishment had higher levels of ERN. This indicates greater activity in the ACC, which correlates with greater anxiety, increased negativity, and, consequently, a decrease in well-being.[22] The results from the comparison group that focused on religion as a source of peace were similar to those of the group that focused on God's punishment. This similarity suggested to the researchers that the higher levels of ERN might not have been caused by thoughts of God's punishment but rather such distress was prevented by thoughts of God's love as the "buffer," or that the thought of God's punishment did not elicit the amount of discomfort they had anticipated in their subjects.[23] Consequently, a positive view of God seems to be associated with more positive neural circuits and, therefore, a greater sense of peace and well-being. A fear-based view of God can therefore be associated with greater anxiety, the development of fear circuits, and increased negativity due to the absence of a positive view of God or as a result of the fear-based view of God.

CONCLUSION

Although religion is intended to be a source of meaning and comfort in the lives of those who practice Christianity, it can sometimes be a source of fear. The neural circuits that are activated in the minds of believers depends on their view of God's primary characteristics. When God is viewed as an angry and punishing God, the Amygdala and other brain structures related to fear are activated and strengthened. When God is perceived as loving, the Anterior Cingulate Cortex is strengthened and responds by increasing one's capacity for compassion and empathy. The ACC also has greater potential to regulate emotions, control anxiety, and allow an individual to make choices that are not dictated by fear. The stronger the religiosity of an individual, and the stronger the focus on God as loving, the lower the error-related negativity will be in the face of mistakes. This neural signal, which is produced in the Anterior Cingulate Cortex, is an indicator of anxiety and negativity levels within the brain. That being said, those who perceive God as loving are less anxious and are more positive with healthier neural circuits, while those who focus on God as primarily punishing—or who simply do not view God as *primarily* loving—are prone to have more anxiety, negativity, and unhealthy neural circuits. One's perspective of Deity alters the entire wiring of the brain. Although these neural circuits are impressionable due to certain proteins in the brain and the phenomenon of neuroplasticity, it is no doubt that they can significantly influence the daily lives of individuals and their perceptions of reality.

18 Good, M., Inzlicht, M., & Larson, M. J. (2015). God will forgive: Reflecting on God's love decreases neurophysiological responses to errors. *Social Cognitive and Affective Neuroscience, 10*(3), 357-363. Doi: 10.1037/t01244-000

19 Ibid. 358-359

20 Ibid. 358

21 Ibid. 360

22 Ibid. 360

23 Ibid. 360-361