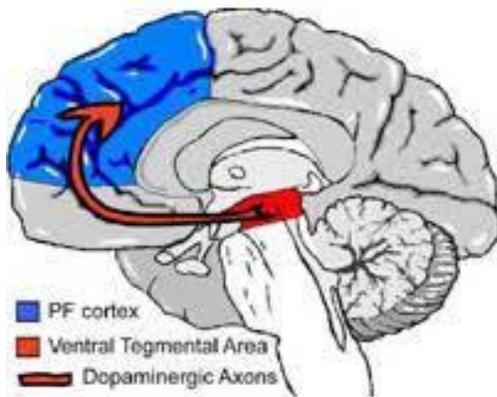


Daily Life with Christ-62. Understanding brain addictions (2)—our “dope-producing” VTA (ventral tegmental area).



Undoubtedly, most of us have been touched by brain addictions in one way or another—either in our own experience or in a loved one. While there are many spiritual and psychological factors in the development of brain addictions, this study focuses on how such addictions physically change the brain and thus affect a person’s mental state, emotional life, and behavior. The physical changes in the brain explain, in part, why it is extremely difficult for a person with a brain addiction to give up his addiction, even if the addiction is destroying himself and his family. As a child, I myself have witnessed the perniciousness of alcoholism among family members. I have watched the helplessness of an individual as he “irresistibly” chose the bottle over his love for his wife and children and even to the destruction of his own health. It is indeed a horrendous thing to behold. While everyone is responsible for what he actualizes and thus sews into his character and cravings, it is not only a matter of pure willpower. There are physical components involved, powerful chemicals produced in and by the brain, that can play havoc with the mental life, emotional life, and behavior.

Of course, the addictive brain (the changed/abnormal brain, a brain that irrationally craves something that it knows is self-destructive) is not limited to alcoholism. The basic bio-neurological change that takes place in the alcoholic also takes place in the brains of those addicted to substances such as cocaine, nicotine, caffeine, food, sugar, pornography, video games, et al. The chief difference between someone who is addicted to caffeine versus cocaine is that the results of the former are not as damaging as the latter. On a biochemical level, the craving a person has when he keeps eating due to cravings not related to hunger (and when he knows he should stop) takes place in the drug addict or alcoholic, except in the latter the craving is much more salient, far more powerful. Of course, there is nothing wrong or addictive about eating or drinking moderately, or if I may say “rationally.” It is when the person keeps eating or drinking from non-rational urges that give evidence of an addictive brain. It is the existence of the cravings to keep eating or drinking (when there is not even pleasure in the food or drink) that signals that the pre-frontal cortex (place of rationality) has been hijacked by chemicals produced in the brain. In other words, there are chemicals in the addictive brain that results in the

impairment of the pre-frontal cortex (the rational part that deliberates on consequences). For example, many of the same “dope-producing” (dopamine) cravings in addictive brains are taking place in Christians who cannot seem to stop eating at the all-you-can-eat buffet after church service even when they are no longer hungry as in the unbeliever (or believer) who is a drunk or drug addict in the back alley. This series is designed to help us understand the physical aspects of the irrational brain cravings to enable us all to recognize and break free from brain addictions.

I noted in previous essays five aspects of the mental life: cognitive unconscious, the conscious, the pre-frontal cortex, the nucleus accumbens, and the ventral tegmental area (VTA). Let us note the VTA in this article (see attached illustration). The VTA is part of the reward system. It is in the midbrain, at the top of the brain stem. It is located very near the middle of the head just slightly above the ears, a few inches behind and a little below the nucleus accumbens. It is important to note that brain cells in the VTA project to both the nucleus accumbens and the prefrontal cortex and therefore can influence both pleasure and self-control.

One of the most interesting things about the cells in the VTA is when they fire and when they don't. It is important to note that the activity level in the VTA is not associated with reward. Rather, the neurons fire when reward is expected. When VTA neurons fire, they release a chemical neurotransmitter called dopamine, which plays a central role in addiction. Dopamine has rightly been labeled as the addiction molecule. Studies have shown that all drugs of abuse lead to a significant increase in dopamine when they are taken. Dopamine plays the key role in every addiction known to man—from addiction to alcohol, cocaine, cigarettes, to gambling (cf., what is known as the “gambler's brain”).

For a long time, scientists assumed that dopamine was associated with pleasure and liking, but recent evidence has suggested that that view is wrong. Evidence comes from patients with Parkinson's disease, which is associated with damage to cells in the midbrain that produce dopamine. Parkinson's patients have abnormally low levels of dopamine, and because dopamine also plays a major role in motor control, Parkinson's patients typically exhibit movement-related problems. But even though these patients have low levels of dopamine and associated motor problems, they still experience normal levels of pleasure. So, it appears that dopamine is not about pleasure or liking. Many scientists now believe that dopamine release is associated with wanting or craving, rather than liking. This kind of wanting or craving is an impulsive urge, not a thoughtful long-term goal. Recall, that long-term thinking takes place in the prefrontal cortex. Recall that the “dope-producing” VTA is connected to the cortex and thus undermines rational thinking. The prefrontal cortex is the CEO of the brain as it plays the central role in the life of the mind, and which is designed by God to control addictive behavior and set goals. The dopamine from the VTA can seriously compromise and thus undermine man's unique rational abilities. Note in the diagram how they are connected. Most are very well aware of how increased cravings can weaken inhibition from the prefrontal cortex, and thus undermine rationality and self-control. The greater the amount of dopamine the greater the craving.

In the next essay, I will discuss the two major factors from the VTA that make addictions incredibly difficult to break. The goal, of course, is to get back to a healthy mind, which, by the way, is undermined by the anti-intellectualism in some of contemporary Christianity. Anti-

intellectualism always creates sensatism, which undermines the believer's ability to live a robust and thriving life of the mind in the Lord—to love God with all of one's mind.

Matthew 22:37 Jesus said to him, "You shall love the LORD your God with all your heart, with all your soul, and with all your mind.'

In Esse,

Pastor Don