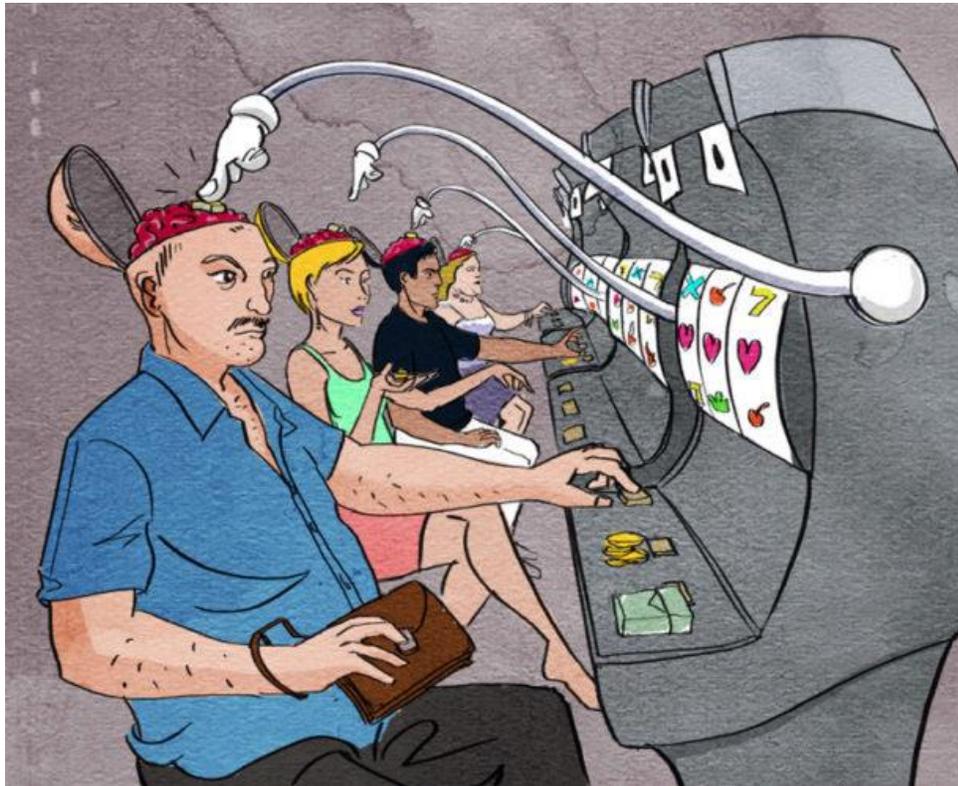


**Daily Life with Christ-79. Understanding brain addictions: how behavior rewires the brain like drugs: E.g., The Gambler's Brain.**

### Brain Activity While Gambling Cont.

In our brain, there is a series of circuits that are called the reward system. This system links various scattered brain regions involved in memory, movement, pleasure and motivation. When stimulated, the neurons release dopamine, which gives the body satisfaction and encourages a habit to form. After continuous release of this hormone, the body makes less of it, and the brain craves more of it. For a gambler, this means participating in riskier ventures. Experts used to think of addiction as dependency on a chemical, they now define it as repeatedly pursuing a rewarding experience despite serious repercussions.



This series began as a New Year's Special aimed in helping us better understand the nature of brain addictions: why it is so difficult to stick to diligently resolved commitments of New Year's Resolutions, year after year after year—even for those who love the LORD and the Word of God.

We are now within the last few articles on brain addictions. Beginning with this article, we move from drug-induced brain addictions to behavior-induced brain addictions. We will examine four types of behavioral addictions: gambling, junk food, pornography, and video games. We will see that behavioral addictions rewire the brain in much the same way as dangerous drugs. Scientifically, we know that certain behaviors change the brain in very similar and destructive ways as does drugs.

Scientists are now viewing brain pathology (the science of the causes and effects of brain diseases) in compulsive gamblers and drug addicts in much the same way. Both the Gambler's Brain and the Cocaine Head include many of the same brain abnormalities. This means that we can no longer think of an addiction simply as a dependence on a particular chemical; it also includes behavioral addictions.

Gambling can be defined as putting something of value—usually money—at risk in the hopes of getting something of greater value. According to American Gaming Association statistics, commercial casinos in America earn more than 35 billion dollars every year. Likewise, revenue in gaming facilities on Indian reservations exceeds 25 billion dollars per year. And those numbers don't even include Internet gambling, which is the fastest growing part of the industry.

About 85% of U.S. adults have gambled occasionally in their lives, and the vast majority don't experience any significant problems. An occasional bet, like an occasional drink, poses no problem for most people. However, an estimated 4-6 million people in the United States experience problems as a result of their gambling, and about 2 million met the criteria for pathological gambling or gambling disorder.

For a long time, psychiatrists considered pathological gambling to be primarily a problem with impulse control, rather than an addiction. Now gambling disorder is classified as a behavioral addiction, based on studies demonstrating that pathological gambling and drug addiction share a number of similarities, ranging from similar behavioral symptoms to similar neural substrates.

Both drug addiction and pathological gambling are characterized by persistence in the behavior despite negative consequences and an inability to stop. The Diagnostic and Statistical Manual of Mental, the standard classification of mental disorders, provides lists of symptoms that mental health professionals have identified as robust behavioral features that should be considered when diagnosing a disorder. The lists of behavioral symptoms associated with drug addiction and with gambling disorder are remarkably similar.

For example, one of the behavioral symptoms associated with drug addiction is “recurrent substance use resulting in a failure to fulfill major role obligations at work, school, or home.”

Similarly, one of the behavioral criteria for diagnosing gambling disorder is whether the person has jeopardized or lost a significant relationship, job, or educational or career opportunity because of gambling.”

Another behavioral symptom of drug addiction is “persistent desire or unsuccessful efforts to cut down or control substance abuse.” Again, we see the same symptoms associated with gambling disorder: “has made repeated unsuccessful efforts to control, cut back, or stop gambling.” Moreover, compulsive gamblers also experience symptoms of tolerance and withdrawal. These withdrawal effects include intense cravings, restlessness, irritability, headaches, insomnia, sweating, and shaking.

Recall the three areas of the brain that are altered with drug addiction: the VTA, the nucleus accumbens, and the prefrontal cortex (see Daily Life with Christ-59 at <http://www.fbcweb.org/Doctrines/010418.pdf>). Through brain imaging, we see the same kind of effects in what is known as the Gambler’s Brain: strong cravings from dopamine, a numbed nucleus accumbens (pleasure center), and an inhibition of the prefrontal cortex (thinking, making good rational decisions). In fact, activation of the prefrontal cortex was significantly reduced in pathological gamblers compared with non-gamblers, and they interpreted this result as evidence for an impairment in prefrontal inhibitory control—which is the same kind of impairment that is present in drug addicts. Moreover, consistent with drug users, chronic gamblers often need to gamble larger and larger amounts of money to feel the same rush of excitement—much like drug addicts who need more drugs to feel high.

Just as traits associated with drug addiction are inheritable, the same is true of pathological gambling. The evidence comes from studies of identical twins who were much more likely to become pathological gamblers than fraternal twins. There is evidence that the same gene may be involved in those who are more vulnerable to alcoholism and gambling. It is likely that the gene is related to a dopamine receptor.

Treatment for pathological gambling includes behavioral modifications. Many people find the 12-step program like Gamblers Anonymous to be helpful because they provide behavioral support and accountability. Also drugs, like the opioid antagonist naltrexone, have been used because they block endogenous opioids and therefore blocks the high associated with gambling. And blocking that high makes gambling less appealing and therefore easier to resist.

God has given us such a wonderful gift we call the brain. It provides the physical basis for our immaterial/spiritual thinking and affections. It enables us to enjoy proper thoughts and proper affections. To undermine the health of the brain is to undermine one’s ability to have proper thoughts and proper love for God, for others, and for the gift of life. A diseased brain is one that is dominated by cravings from the VTA, a numbed pleasure center, and an inhibited thought life in the prefrontal cortex.

It is a rather sobering thought that it is possible for us cause disease in our own brains by our behaviors, brain disease that eerily resembles drug-induced diseases in drug users. Let us redouble our efforts to give ourselves to the Lord—body, soul, and mind—so we can live and thrive in the joy of His love and grace:

**Romans 12:1** I beseech you therefore, brethren, by the mercies of God, that you present your bodies a living sacrifice, holy, acceptable to God, *which is* your reasonable service. <sup>2</sup> And do not be conformed to this world, but be transformed by the renewing of your mind, that you may prove what *is* that good and acceptable and perfect will of God.

Based on the scientific study of behaviorally induced brain diseases, the “renewing of your mind” takes on more physical and spiritual significance. What we actualize in our behavior will affect our brain, which will then affect our mind and with it the ability to enjoy proper knowledge and proper love—as opposed to living out our daily lives with impaired judgment because we are controlled by irrational urges that cannot satisfy a numbed pleasure center (nucleus accumbens).

Thank God that Jesus Christ and Whole Truth provide us with the freedom and abundant life that avoids the aberrations that so plague man, both unbelievers and believers.

For Him,

Pastor Don