Spring 2011

Understanding Drug and Alcohol Addiction from a Biological, Emotional and Relational Perspective

Katie Garrison
Carroll College, Helena, MT

Understanding Drug and Alcohol Addiction from a Biological, Emotional and Relational Perspective

Katie Garrison

Carroll College

This thesis for honors recognition has been approved for the Department of Psychology and the Honors Scholars Program by:

Dr. Joy Holloway (Director)

Dr. Brad Elison (Reader)

Dr. Chris Fuller (Reader)

Acknowledgements

I would like to thank my professors first of all for their time and energy, and their dedication to my thesis. Dr. Joy Holloway met with me weekly for the entire semester to help me discover what this paper was really about. I changed my focus so many times, and the project evolved tremendously. Joy encouraged me the entire time, inspiring me, and allowing me the freedom to let my creativity soar. I would also like to thank Dr. Brad Elison. He took on the last-minute challenge of helping me with some major editing, which transformed my paper into a piece of work I can be proud of. I would like to specially thank Joni Walton for her support and guidance during this whole process. She was not even one of my readers, but she gave me her time and advice. Joni Walton was a valuable resource for me in this research process. Dr. Chris Fuller was one of my readers, who I would like to thank for guiding me along in this process. Lastly I would like to thank my family, specifically my mother, who listened to my thoughts as I explored this topic. We would hike and talk and explore ideas together; she was critical in guiding me along this research process.

Dedication

I dedicate this thesis to my family. Their love and support has made me who I am today. The struggles we have faced together allow us to know the depths of our love for one another.

Abstract

Drug and alcohol addiction is a very controversial issue in America today, and it is extremely common in our society. Evidence suggests that biological and physiological brain mechanisms are involved in drug and alcohol addiction, and that emotional and psychological development also play a key role. Furthermore addiction can be seen in terms of interpersonal relationships: the family system involved and the individual's relationship with his or her drug of choice. Lastly, addiction can be understood in terms of effective treatment and what it takes for a person to recover. The purpose of this thesis was to explore various perspectives on drug and alcohol addiction, in order to develop a better understanding of the nature of this disease. Findings indicated that there are significant differences in the brain structure and function of individuals with an addiction when compared to non-addicted individuals. Research studies and personal interviews suggest that there also seems to be a strong connection between negative emotions and the development of a substance abuse problem. Additionally, it was determined that the effects of an addiction can influence entire family systems causing significant dysfunction (Black, 1981). The findings in this paper indicate that addictions are extremely complex and the bio-physiological, emotional, and relational aspects of an addiction all are important factors in understanding this disease.

Table of Contents

Introduction

Drug and alcohol addiction is a very complex problem, and one that has been studied from a variety of perspectives. The characteristics typically associated with addiction are found in the Diagnostic and Statistical Manual of Mental Disorders. According to the DMS-IV-TR, "the essential features of Substance Dependence are a cluster of cognitive, behavioral, and physiological symptoms indicating that the individual continues use of the substance despite significant substance-related problems. There is a pattern of repeated self-administration that can result in tolerance, withdrawal, and compulsive drug-taking behavior" (APA, 2000).

Historically, addiction has been associated with a moral defect or a lack of willpower. Alcoholism is mentioned in the Bible, referring to the negative consequences that alcoholics face due to their drinking, and still their insatiable desire for more (Proverbs 23:29-35, Revised Standard Version). In our society today, some still view addictions as a weakness or matter of will power. This can be seen in general attitudes of the public, media portrayals of addiction, and our stigma against people with addictions. Addictions may be associated with crimes and violence in our society, because many times criminal activity is drug or alcohol related (NIDA, 2008). The association between crime rates and drug and alcohol abuse negatively influences our attitudes about addiction in out society.

Research demonstrates that addictions come with a variety of emotional disturbances and co-morbid mental health issues such depression, anxiety, anger or

suicide ideation (Dennis cited in HBO *Addiction* 2007). These factors contribute to the severity of the disease, as well as our attitudes towards drug and alcohol addiction.

Another way to understand an addiction is in the context of the relationships that are influenced by it. This includes the intense relationship that an individual develops with his or her drug of abuse (Adams, 2008) and also the changes that occur within a family when an addiction is present in the household (Black, 1981). The presence of an addiction in a home dramatically changes the way a family functions (Black, 1981). By exploring addiction through the context of interpersonal relationships, the nature of this disease can be viewed from a larger perspective.

It is important to understand the nature of drug and alcohol addiction because it is such a pervasive problem in American society. According to the National Institute of Drug Abuse nearly 22 million Americans suffer from addiction (2008). America has one of the highest levels of substance abuse in the world, with approximately 30% of our population reporting a problem with addiction at some point in their life (Compton et al., 2001). Individuals suffering from drug or alcohol addiction represent all ages, all occupations, and all regions of the country. Addictions do not discriminate.

Addictions place a substantial burden on our society economically (NIDA, 2008). Currently our prisons are overflowing with drug offenders, and crimes due to drug offenses account for more than 80% of the increase in prison inmates since 1985 (NIDA, 2008). Medically, drug and alcohol addictions are also very costly. According to the National Institute of Drug Abuse, 14 percent of patients admitted to hospitals in America each year have an alcohol or drug addiction (2008). Also, 20 percent of the hospital costs covered by Medicaid are alcohol or drug related, and Medicare spends about $1 out of

every $4 on patients needing treatment for injuries or illness that are substance-abuse related (NIDA, 2008). Larry Gentilello, chief surgeon of the trauma unit at the Parkland Memorial Hospital in Dallas, Texas, explained in an HBO interview the devastating effects of drug and alcohol abuse that he sees in the emergency room (HBO *Addiction*, 2007). Gentilello stated that of the approximately 30,000 patients that visit the emergency room every year, nearly half of those are drug or alcohol related (HBO *Addiction*, 2007). Dr. Nora Volkow, from the National Institute of Drug Abuse, in a congressional testimony summarized the costly nature of addiction as follows, "Economic costs alone are estimated to exceed half a trillion dollars annually in the United States, including health, crime-related costs, and losses in productivity. However, as staggering as these numbers are, they provide a limited perspective of the devastating consequences of this disease" (2007).

Because of the multiple perspectives on drug and alcohol addiction, and the wide range of impacts it has, the purpose of this paper was to explore the nature of drug and alcohol addiction through a variety of sources in order to develop a comprehensive picture of this disease. With an expansive understanding of this problem, compassion will arise for those individuals who suffer from the disease of addiction. Drug and alcohol addiction was explored through a biological perspective of the brain mechanisms involved, from the viewpoints of emotions and relationships, and from the personal testimonies of individuals suffering from addiction. The recovery process was also explored to obtain a clear understanding of effective treatment and what the individual undergoes when in the process of recovery. With these components of addiction under

review, the goal was to understand the complex nature of drug and alcohol addiction to bring awareness, more effective intervention and compassion to those who suffer.

Methods

To paint a clear picture of the nature of drug and alcohol addiction, a number of perspectives were studied. The physiological and biological mechanisms of drug use and drug addiction were explored. The emotional components of addiction were also studied, including the realm of emotional development in childhood. A relational view of addiction was also explored, from the perspective of an addiction as a relationship with the drug of choice, and the effects that an addiction has on the family. Personal accounts of individuals in recovery from addiction were reviewed via tape recordings of two male members of Alcoholics Anonymous, a documented interview of an individual addicted to cocaine who participated in a research project (Childress et al, 1999), and personal interviews with two women in recovery from alcoholism. The process of treatment and recovery was then explored to help further understand the nature of drug and alcohol addiction.

Results

Physiological Effects of Common Drugs of Abuse on the Brain

Drugs of abuse are ingested partly for the pleasurable effects that they create. The feelings of pleasure associated with certain drugs of abuse—euphoria, relaxation, body sensations, even hallucinations—are the direct result of neurotransmitters being manipulated in the brain (Kalat, 2009). Drugs affect the synapses in our brains. The synapses are the sites between neurons where neurotransmitters are released. Drugs have affect neurotransmitters by either increasing their production, decreasing their reuptake back into the cell, or blocking the receptors on the post-synaptic neuron (Kalat, 2009). Each of these mechanisms produces basically the same result: more of the specific neurotransmitter in the synapse. The over-saturation of these chemicals in our brains is essentially what produces the sensation induced by drugs.

The main neurotransmitters that are affected by the ingestion of drugs are dopamine, norepinephrine, and serotonin (Kalat, 2009). These neurotransmitters are the "pleasure" chemicals. They produce feelings of euphoria, pleasure, and general arousal. Although each drug produces a slightly different effect, most drugs affect the mesolimbic dopaminergic pathway in the midbrain, specifically the inner limbic system (Kalat, 70). The limbic system is the emotional and impulsive region of the midbrain. The limbic system is deep within the unconscious, subcortical regions of the brain, and its axons stretch to all parts of the brain, including the frontal cortex.

Drugs of abuse like amphetamines, cocaine, MDMA (ecstasy), opiates, marijuana, hallucinogens, and even nicotine affect neurotransmitters in the brain, mainly in the mesolimbic system and anterior nucleus accumbens (Kalat, 2009). Amphetamines, or

stimulant drugs, increase the amount of dopamine being released at the synapses and cause feelings of arousal and alertness (Kalat, 2009). Cocaine also increases the amount of dopamine in the synapse, but it does so by blocking the reuptake of dopamine back into the cell. Cocaine ingestion thus produces a greater and longer lasting effect for dopamine, which produces feelings of happiness, excitement, and alertness (Kalat, 2009). Both cocaine and other stimulant drugs produce the result of excess dopamine accumulation in the synapses between neurons. The brain is literally saturated in these feel-good chemicals. The effects do not last for long, however. The neurons do not naturally produce more neurotransmitters while they are already present in such excess, thus when they eventually dissipate the brain is deprived of these neurotransmitters, causing the individual to feel a "crash" (Kalat, 2009).

MDMA, or ecstasy, affects the brain in a slightly different way from that described above in cocaine and amphetamines. At low doses it acts like a stimulant and increases the amount of dopamine in the synapses (Kalat, 2009). But at larger doses it produces serotonin instead, which has more of an effect on perceptions and cognitions. High doses of MDMA can be extremely damaging to neurons and the body in general. MDMA increases a person's body temperature and the amount of hydrogen peroxide in the brain, which can damage or even kill neurons (Kalat, 2009).

Hallucinogens such as LSD and psilocybin are similar to MDMA in that they affect serotonin, which alters perceptions and cognitions. But hallucinogens are actually made of chemicals that resemble the serotonin molecule and therefore mimic its effects (Kalat, 2009). They do not affect the release of serotonin; they act as if they *were* serotonin and "trick" the post-synaptic neuron into responding.

Opiates are drugs derived from the poppy flower. Opiates include heroin, morphine, and painkillers such as methadone. Opiates are used as painkillers because they act on the brain just like the body's natural endorphins do (Kalat, 2009). The body produces endorphins that attach to certain receptors in the central nervous system to relieve pain. Endorphins do not reduce pain by going directly to the peripheral source, e.g. the arm. They act on receptors in the brain to block the pain messages being sent to the brain. For this reason opiates can produce the same effects as endorphins. When opiates are ingested they bind to receptors in the brain and produce a relaxing and pleasurable feeling in the body.

Marijuana is a plant that contains cannabinoid chemicals (Kalat, 2009). Cannabinoids relieve pain and nausea and have natural receptors in the brain just as opiates do. Nicotine is a drug that is derived from the tobacco plant. Nicotine also has naturally found receptors that it can bind to in the brains. These receptors, called nicotinic receptors, are abundant in the reward center of the brain and also at the neuromuscular junctions at our muscles in the body (Kalat, 2009). In essence, our brains come pre-wired to respond to drugs such as nicotine and marijuana.

Alcohol affects the mesolimbic reward pathway just as other drugs of abuse do, but its main action is to inhibit responses in certain regions of the brain (Kalat, 2009). Alcohol produces a response in the neurotransmitter GABA, which is the brain's primary inhibiting chemical (Kalat, 2009). Alcohol also blocks the release of glutamate, the brain's excitatory chemical (Kalat, 2009). The net effect of this process is also inhibition. There is a general decrease in brain activity, especially in the controlling areas such as the

prefrontal cortex. This inhibition produces feelings of relaxation and "loosening up" feelings that are associated with drinking.

The biological processes in the brain that are affected by drugs and alcohol provide a rich understanding that can help explain the addictive quality of these drugs.

Biological Components of Drug and Alcohol Addiction

The nature of addictions is becoming better understood with advances in science and technology. Modern technology such as neuroimaging allows scientists to see inside the brains of addicted individuals and determine physiological differences in their brain functioning and structure. Through neuroimaging, beliefs about the nature of drug and alcohol addiction are changing dramatically. There is now evidence of physical cravings in the deep limbic regions of the brain (Childress et al., 1999) and significant structural changes at the molecular level after prolonged drug use (Spanagel & Heilig, 2005).

A study performed at the University of Pennsylvania in 1999 demonstrates the physiological cravings associated with drug addiction. The researchers investigated the limbic activation in individuals addicted to cocaine by showing them cues of their drug (Childress et al, 1999). PET scans were used to measure the cerebral blood flow (CBF) in the limbic regions of 14 detoxified male cocaine users and a control group of 6 cocaine-naïve participants. The subjects were shown videos or pictures of cocaine-related events (drug paraphernalia, the drug itself, people using the drug) and non-drug-related events. The images were just a flash—approximately 0.5 seconds long—so that the prefrontal cortex could not fully register the image. This is important because it demonstrates that cues can sometimes trigger a craving without the addicted individual being conscious of

it. The results of this study showed that the cocaine-users experienced increased CBF in the limbic areas (amygdala and anterior cingulate) and a decrease of CBF in the basal ganglia (inhibiting organ). The increase in blood flow signified a physiological craving. It correlated with the intense craving that an addicted individual felt when exposed to a drug-related cue in his or her environment. The study demonstrated the reflex-like response that the addicted individual feels for the cue. The response was similar to a reflex like the "kick" reflex when a doctor taps one's knee. It was an impulsive and automatic reaction. The comparison group in this study did not show similar patterns in these areas, and all other brain regions of the two groups did not differ (Childress et al., 1999). The authors of this study conclude that limbic activation is one component in cue-induced craving for cocaine.

Prolonged drug use has been shown through neuroimaging to result in significant changes at the molecular levels of the brain (Spanagel & Heilig 2005). When the brain produces dopamine as a direct result of drug consumption, the body stops making it naturally. Using PET imaging, Dr. Nora Volkow and Ting-Kai Li (2004) studied the brains of addicted individuals and found a significant reduction of dopamine D2 receptor dendrites (as cited in Spanagel & Heilig 2005).

Loss of brain tissue was also observed in patients with chronic alcoholism in a study performed by Margaret Rosenbloom, M.A., and others in 2003 (as cited in Spanagel & Heilig 2005). Using a new magnetic resonance technique known as DTI, these researchers observed a loss of both gray matter (the neuron bodies) and white matter (the axons that send messages to and from neurons) in patients with chronic alcoholism, mainly in the frontal cortex (as cited in Spanagel & Heilig 2005).

The prefrontal cortex is the area of the brain that deals with rational thought, impulse control, decision control, and weighing the consequences of our actions (Spanagel & Heilig 2005). The prefrontal cortex takes a long time to develop and isn't fully mature until we reach adulthood. Adolescents have not yet fully developed their prefrontal cortex, and as a result tend to be more impulsive and less able to judge the consequences of their actions (HBO *Addiction*, 2007). According to a collaboration of addiction specialists featured in the HBO documentary, *Addiction*, addiction almost always begins in adolescents between the ages of 15 and 25 (2007). In fact, "95 percent of adults dependent on or abusing alcohol started drinking before the age of 21" (HBO *Addiction* 2007). Adolescents do not yet have the override of the prefrontal cortex to control their impulses.

Genetics also play a crucial role in addiction, especially alcoholism. An adoption study by D.W. Goodman (1973) demonstrated that with male adopted children, it is the biological parent rather than the adopted parent that is more predictive of alcoholism (as cited in Begleiter et. al, 1984). A similar genetic finding by E. Johnson (1968) demonstrated that the concordance rate of alcoholism was almost twice the rate in identical twins as compared to fraternal twins (as cited in Begleiter et al, 1984). Alcoholism tends to run in families, and sons of alcoholic fathers are at the highest risk for developing alcoholism (Begleiter et al, 1984). A study measuring event-related brain potentials in the sons of alcoholic fathers reported deficits in the voltage of the brain wave P3 in boys who were at high risk for developing alcoholism because their fathers had alcoholism (Begleiter et al, 1984). The researchers noted that these findings were

obtained prior to the boys' first drink of alcohol, so they could not be due to alcohol consumption but were predictive of an alcohol dependency (Begleiter et. al, 1984).

Structural differences have also been observed in the brains of individuals who are at high-risk for developing alcoholism. Researcher Shirley Y. Hill and others (2001) found the volume of the right amygdala to be smaller in individuals who come from families with alcoholism (as cited in Kalat, 2009). Hill concluded that the physiological brain abnormalities were predictive of later drinking habits, since they were discovered in high-risk individuals who had not started drinking yet (2001).

Although there is no specific gene that has been discovered to be predictive for developing alcoholism, there is data that supports genetic factors of alcoholism as shown in physiological differences in individuals who are at high-risk for developing alcoholism (i.e., have a family history of alcoholism) when compared to control groups. According to a retrospective study by primary care physicians, subjects who reported a higher tolerance to alcohol and less of a physical response to alcohol, were more likely to develop alcoholism later in life (Daeppen et al, 2000). A similar study by Schuckit and Smith (1996) found that sons of alcoholics showed lower alcohol tolerance levels on an EEG and overall less physical symptoms of alcohol intoxication as compared to a control group (as cited in Kalat, 2009).

The biological evidence points to a variety of genetic and physiological components that may contribute to the development of an addiction and the prolonged effects of an addiction on the individual.

Emotional Components of Drug and Alcohol Addiction

According to the DSM-IV-TR the problem with drug and alcohol addiction has less to do with the actual effects of the drug, and more to do with the inability of the individual to stop using in spite of difficulties caused by the substance (DSM-IV-TR 2000). The question remains, what causes an individual to use drugs in the first place, and what causes him or her to continue using despite negative consequences?

The groundbreaking ACE (Adverse Childhood Experience) study examined nearly 9,000 people over a period of 12 years, and is one of the most important research reports about childhood trauma and substance abuse (Dube et al., 2003). This comprehensive study measured the relationship between childhood abuse, neglect and household dysfunction and the development of illicit drug use. The entire study examined 8613 adults who completed a survey with 10 categories of ACEs (Adverse Childhood Experience) (Dube et al. 2003). The ACEs included emotional, physical or sexual abuse; emotional or physical neglect; growing up with substance abuse in one's household; criminality among family members; mental illness among the household members; parental discord; and illicit drug use (Dube et al., 2003). The results of this study showed a strong correlation between aversive childhood experiences and illicit drug use later in life. With the addition of each new category of ACE, the likelihood of initiating drug use was increased 2- to 4-fold (Dube et al.2003). High numbers of ACEs also increased a person's likelihood of lifetime drug use. Drug addiction was not specifically measured in this study, however it was noted that high ACE scores increase a person's likelihood of ever having drug problems or being addicted to drugs.

Emotional disturbances are common in people who suffer from addiction problems. Peter J. Adams, author of *Fragmented Intimacy: Addiction in a Social world*, explains that people with drug addiction problems tend to see themselves as unworthy or unfit and they perceive the world as a hostile place (Adams, 2008). Individuals who suffer from addiction typically feel general and pervasive negative emotions, not associated with anything specific, but omnipresent (Adams, 2008). Feelings such as fear, resentment, and shame pervade the individual and his or her drug serves as a source of strength or comfort for them (Adams, 2008). This idea is parallel to the idea of self-medication, where the individual uses drugs to attain temporary relief from the negative emotions he or she feels. The drug allows for an escape from the hostile world he or she experiences. The momentary intoxication felt serves as a sanctuary from the deep, negative feelings that encompass the individual. "The difference is not in the type of emotions but in their extent. The demands of living in an addictive relationship plus the effects of intoxication prevent normal processes of resolution from occurring. What in a normal circumstance would be addressed and resolved, in an addictive context accumulates into one tangled unmanageable block that hangs deep within" (Adams 2008 p.91). Adams notes the individual's inability to cope with life's problems when involved in an addiction, and the overwhelming accumulation of negative emotions that this creates.

Drug and alcohol addictions are associated with multiple co-morbid mental health problems such as depression, anger, anxiety, suicide ideation, self-mutilation and other psychological disturbances (HBO *Addiction*, *2007*). Psychologist, Dr. Michael Dennis of Chestnut Health Systems, has experience with a number of individuals with drug abuse

problems coming into treatment facilities (HBO *Addiction*, *2007*). Dennis states that about one-third of his patients self-mutilate, and he describes the tremendous amount of anger or delinquent behavior that he sees with them.

The Role Relationships Play in Addiction

It is important to take a look at drug and alcohol addiction in the context of the relationships involved. An addiction itself can be examined in terms of a relationship the individual has with his or her drug of choice. An addiction can also be viewed in the context of the responses elicited from the family involved.

An addiction is extremely destructive within the family system (Black, 1981) and in all the other relationships that are affected by an individual's substance addiction. The DSM-IV explains that a substance may become the individual's number one priority over social, occupational, or recreational activities (2000). When substance use gets to this stage, in which the individual gives up meaningful things in his or her life in order to continue using the substance, it is then considered a Substance Dependency (DSM-IV 2000). The World Health Organization describes individuals with alcoholism as, "those excessive drinkers whose dependence on alcohol has attained such a degree that it shows noticeable mental disturbance or interference with their bodily or mental health, their interpersonal relationships and their smooth social and economic functions… They, therefore, require treatment" (as cited in Adams 2008). The support group Narcotics Anonymous describes addiction in this way:

> Our disease isolated us from people except when we were getting, using and finding ways and means to get more. Hostile, resentful, self-centered and self-seeking, we cut ourselves off from the outside world. Anything not completely familiar became alien and dangerous. Our world shrank and isolation became our life. We used in order to survive. It was the only way of life that we knew (as cited in Adams, 2008).

These definitions reflect isolation, and an intensifying relationship with the addictive substance, accompanied by the deterioration of other relationships like a person's job or hobbies, and their family and friends. Peter J. Adams, author of *Fragmented Intimacy* describes an addiction as an intense relationship with the object of addiction (2008). His book describes the process of strengthening the relationship with the object of addiction, and the weakening and fragmentation of all other meaningful relationships in the person's life (Adams 2009). "When a person's social world is reorganized around this singular and dominant relationship, the new structure entails progressive deterioration in connections with the world around. Furthermore, the relationships that are most affected by these deteriorating connections are those with people who are closest and most loved, and consequently it is in the realm of intimacy that addictions are most actively destructive" (Adams 2008, p.6). Adams explains that the addictive relationship becomes such a source of strength and comfort for these individuals, that when they feel the stress of their deteriorating world they cling to the substance even more—causing a self-perpetuating cycle of addiction (2008). This social system is rigid and inflexible, completely centered around the addiction (Adams 2008). Thus, the family and friends of the addicted individual suffer as well.

An addicted family system may develop a variety of dysfunctional patterns in communication and behavior (Black, 1981). While the addicted individual is immersed in the world of his or her drug, the family may develop a wide range of responses to this change. Family members may deny the problem, try to fix it or control it, or simply ignore the fact that the problem exists (Adams 2009). Claudia Black, Ph. D., M.S.W., worked for years as a social worker providing treatment for alcoholism. She wrote a book, *It Will Never Happen To Me,* that addresses the responses typically found in children growing up in a family with active alcoholism (1981). Through her work and observation, Black developed three main roles that children tend to play to deter the effects of the alcoholism. These roles are the responsible one, the pacifier, and the adjuster (Black 1981).

The responsible children take on the responsibility of the alcoholic parent when they are unable to do so. They may make dinner for the family, take care of their younger siblings, and drive their parents around when they are too drunk to drive, or nurture the family in times of stress (Black 1981). These children, no matter how old they may be, become adults in this situation. They are seen from the outside world as responsible and mature, but in reality they are suffering greatly.

The pacifier makes peace within the family. He or she tends to be highly sensitive to the feelings of others, and can sense the tension in their family. These children feel the anger, fear, or embarrassment felt by their family and they try to mend it (Black 1981). Again, these children appear healthy from an outside perspective. They seem caring and mature and maybe a little shy, but they are devoting a large amount of their time and their

lives to making peace in the family when they should be concerned with their own development.

The third role children tend to play is that of the adjuster. The adjuster children can adjust to any situation they are thrown into. They have experience in all types of situations due to the instability of their homes, and so they easily adapt (Black 1981). They are good at making themselves comfortable in chaotic environments, and they are very self-sustaining (Black 1981). According to Black, the problem here is that these children do not realize they deserve a warm and loving environment. They have adapted to living in an abusive household, so they easily put up with it (1981).

Black also describes certain characteristics that are generally found in families with alcoholism. One characteristic of the alcoholic family is the disturbed and dysfunctional communication patterns. There is secrecy around the alcoholism. No one is to talk about it, no one is to feel their feelings, and no one in the family can be trusted (Black, 1981). The family is to look good and act normal; no one is to know that there is a problem. For example, parents may not explain to their children why their dad is passed out drunk on the floor, or perhaps children won't bring their friends over to their house because of the possibility that their mom is drunk and violent. The family lives in a world of denial and secrecy around the main problem that is the addiction (Black, 1981). There is a lot of unpredictability in a household with alcoholism. There also appears to be quite a bit of secrecy surrounding the problem of alcoholism. "It has been my experience that by the time a child being raised in an alcoholic family reaches the age of 9, he has a well-developed denial system about both his feelings and his perceptions of what is happening

in the home" (Black, 43). Children in this chaotic and dysfunctional environment do what they can to cope and survive.

A study of psychiatric disorders in adult children of alcoholics, performed by R. Matthews and W. Wilson in 1993, found that adults brought up in an addictive context were more likely to develop antisocial symptoms and anxiety disorders than those who grew up in non-addictive contexts (as cited in Adams 2008). There are a variety of ways that family members respond to an addiction. There is no "typical" or "standard" response. But the unhealthy behaviors of the addicted individual, and the resulting involvement of his or her family system, will likely leads to some sort of dysfunction within the family and intimate relationships.

What can be learned about Addiction from the Recovery Process

One characteristic of drug and alcohol addiction is the phenomenon of relapse. Medical professionals argue that relapse should be accepted as part of the disease of addiction, not as a failure (Childress, HBO *Addiction*, 2007). The notion of relapse is that an addiction can return at anytime for the individual, regardless of a period of abstinence. Physical cravings can occur in addicted individuals in response to cues, even long after they have abstained from the drug; as seen in the limbic activation studies with detoxified cocaine users (Childress et al, 1999). In fact, it seems to be more likely for an addicted individual to relapse after one has detoxified completely from the drug rather than when the individual is in the process of detoxification (Spanagel & Heilig, 2005). The activation in the limbic system that causes a reflexive physical craving appears to be part of the nature of the disease of addiction. This reaction to cues does not disappear when

the individual has abstained from the drug for a period of time; it appears to stay in the physiology of the individual. The possibility of a relapse may be partly why individuals with chronic alcoholism stay in recovery programs such as Alcoholics Anonymous for many years after they have achieved sobriety (Big Book Comes Alive, 1998). These individuals likely recognize the fact that alcoholism is a chronic and relapsing disease that can come back at any time.

Relapse is not a sign of weakness. It is part of the nature of drug and alcohol addiction. Alan I. Leshner (2011), from The Frontiers in Neuroscience: The Science of Substance Abuse states in his article, *Addiction as a Brain Disease*, that drug and alcohol addiction should be viewed as a chronic and relapsing disorder rather than an acute illness. "Total abstinence for the rest of one's life is a relatively rare outcome from a single treatment episode." Leshner argues, "Relapses are more the norm. Thus, addiction must be approached more like other chronic illnesses—such as diabetes or chronic hypertension…. A good treatment outcome… is a significant decrease in drug use and long periods of abstinence, with only occasional relapses" (Leshner, 2011). Fortunately there are a variety of treatment options to combat the symptoms of this disease.

There are a wide range of treatments to help manage drug and alcohol addiction. Because the nature of the disease is so complicated, and individual differences are so varied, no one form of treatment works for everyone. Some people need psychotherapy or family therapy. Some need support groups such as Alcoholics Anonymous. Others seem to show success from medications that affect the chemistry of the brain. The wide variety of treatments is helpful for the magnitude of people that are in recovery and rehabilitation. Recovery is a process of rehabilitation. It is a healing process that the

individual undergoes. Recovery lasts a lifetime, and requires constant work on the part of the individual so that they won't slip back into the clutches of their addiction (as testified by M and C, personal communication, March 29, 2011).

To combat the molecular brain changes that occur with addiction, there are now medications available to reduce one's physical craving and prevent a relapse. Baclofen is a modern medication that helps reduce the physical cravings associated with activity in the limbic system (Childress et al, 1999). Disulfiram, or Antabuse, is a drug that is put into one's drink that will make them feel nauseas (HBO *Addiction*, 2007). The hope here is that the individual will be classically conditioned to stay away from alcohol after it makes them sick. Acamprosate (Campral) is another common drug to fight the cravings of addiction, and the drug Naltrexone (ReVia) prevents the possibility of a full-blown relapse if the individual happens to slip and take one drink (HBO *Addiction*, 2007). These medications are revolutionary in the recovery field of addiction. They work on the brain chemistry of the individual and help reduce cravings and reduce the chance of relapse. However, usually medication is not sufficient for combating drug and alcohol addiction alone.

Support groups such as Narcotics Anonymous (NA) and Alcoholics Anonymous (AA) have helped countless individuals achieve sobriety and maintain sobriety throughout their lives. Alcoholics Anonymous began in the 1930s on the basis of "self-improvement by performing self-inventory, admitting one's wrongs, making amends, using prayer and meditation, and carrying the message to others"(Alcoholics Anonymous World Services, 2010). The fellowship consists of a diverse group of men and women who share their experience, strength and hope; they come together to share their common

suffering (Alcoholics Anonymous World Services, 2010). The book of Alcoholics Anonymous, or the Big Book as it is called, is dedicated to the thousands of men and women who have recovered from alcoholism (Alcoholics Anonymous, 2001). Beginning in the early 20th century, Alcoholics Anonymous is still a widely used program today that has helped thousands of men and women achieve sobriety.

Personal Accounts of Individuals With an Addiction

Personal testimonies provide an invaluable perspective on the nature of addiction. Individuals who suffer from addiction know first-hand what it is like to be in the grasp of such a powerful disease. To preserve anonymity, names will not be used. In the HBO series, *Addiction*, an addiction specialist interviewed a young man who was participating in a research study involving cravings (Childress et al, 1999). This man was addicted to crack cocaine. “I’ve always lost the battle,” he said. “I’ve lost the battle again, and I’m using again. And when I sit and use after a battle like that I feel bad because I couldn’t win—or didn’t win.”

This man’s frustration with his addiction comes from the fact that he cannot stop using even though he wants to. He feels ashamed because he cannot stop, as though he cannot win. “I do not want to live my life under the grips of my addiction,” he said. “I will be an addict all my life, but I want to be an addict not using.” This testimony is just one of many heart-breaking accounts of individuals who are suffering because of their addictions.

Two long-time members of Alcoholics Anonymous, referred to as "J" and "C" for this paper, travel around and share their experiences with the disease of alcoholism. In a tape recording of one of their talks, C gave a speech about his first encounter with Alcoholics Anonymous. He was told that he had an allergy to alcohol (Big Book Comes Alive, 1998). This definition baffled him. An allergy, he thought, was getting a rash or breaking out as a result of eating something or being exposed to something. What he learned was that an allergy was an "abnormal reaction to any food, beverage or substance of any kind" (Big Book Comes Alive, 1998). What he learned is that his reaction to alcohol was abnormal. When normal people drank, he noted, they felt more relaxed. When normal people had too much to drink they felt nauseous and sometimes needed to vomit. After all, alcohol is a toxic drug ingested into the body. The reason that he identified his reaction to alcohol as "abnormal" is that when he drank, he did not feel more relaxed. He felt energized and alive, and the more he drank the more he felt a physical craving for more. The physical craving for more is precisely why he was told in AA that he had an allergy to alcohol—he experienced an abnormal reaction to the drug (Big Book Comes Alive, 1998). C talked about how he watched the behaviors of normal social drinkers when they drank. He saw how they could drink slowly as they carried on a conversation with someone. They could drink one or two or even three drinks and then stop. He always thought that these people were just stronger than he was; that they had the will power to stop when he could not. What C realized after coming to Alcoholics Anonymous was that these people were not stronger than him. The truth was that they drank just as much as they wanted to. They simply didn't experience the intense craving

for more like he did. “I drank alcohol for 26 years,” C said, “and I never did get all I wanted to drink” (Big Book Comes Alive, 1998).

C then went on to explain what alcohol did for him. “I drank because I knew… magical things would begin happening. My fears, my anxieties, my worries, my inabilities to communicate with people, my inability to ask girls on dates and dance with them; I knew those would all go away if I could get that alcohol down and it’d stay down there. As a kid growing up I was always on the outside of the crowd looking in, never could be what I wanted to be. Always knew that whatever I did would be wrong. One night somebody gave me a drink of alcohol and I took it; and all those fears disappeared” (Big Book Comes Alive, 1998).

Two young women in recovery from alcoholism were interviewed about their experiences with addiction; they are referred to as “M” and “B” to preserve their anonymity (personal communication, March 29, 2011). Both of them agreed that they were “born an alcoholic” (M and B, personal communication, March 29, 2011). B explained that she felt angry her entire life, and not comfortable in her own skin from the day she was born (March 29, 2011). B also remembered always being afraid—afraid of everything. She said she felt like she was on the outside of the bubble, and never fit in. The first time she smoked marijuana, B explained, she felt “right” for the first time in her life and that it drastically reduced the pervasive fear that she typically experienced (March 29, 2011).

M had a similar experience with alcohol. M described how she knew that alcohol would do magic things for her before she even tried it. After her first drink, she thought she had “found the missing piece of her soul” (March 29, 2011). M and B both stated that

they felt many negative feelings in their life, and how they didn't know how to deal with them; so they medicated with substances (March 29, 2011). M described the confusion she felt because she thought that her negative feelings were normal, and she didn't understand how other people could live their lives so peacefully if they felt like she did (March 29, 2011).

After M had her first drink of alcohol, she immediately felt the intoxicating effects (March 29, 2011). M described the agitated feeling she got after drinking a beer—the effect that she now attributes to her physical allergy to alcohol. She did not feel calm or relaxed at all; the alcohol made her feel restless and energized, and she would need to keep drinking. "I would just drink and drink and drink and drink and drink until I passed out" (M, personal communication, March 29, 2011). The "allergy" that was talked about had two parts. One was the physical craving for alcohol, and the other was an insatiable need for more (M and B, personal communication, March 29, 2011). B explained how she would always bring her own alcohol to parties because she knew that there wouldn't be enough (March 29, 2011).

M and B then went on to talk about their recovery. They both attended Alcoholics Anonymous. They explained that it was the behavior change that was difficult about recovery; it went against their nature (M and B personal communication, March 29, 2011). They explained how they have an instinctual drive towards immediate rewards, and recovery is learning about delayed gratification, dealing with uncomfortable emotions, and working hard to do the "right" thing (M and B personal communication, March 29, 2011). They both explained how difficult recovery was for them, how unnatural it felt, and how it takes constant daily work that will last a lifetime (M and B

personal communication, March 29, 2011). B talked about her experience in getting a sponsor in the AA program. AA is all about faith, she explained, living a life of sobriety that is unimaginable. That is why sponsors are needed, to tell the newcomers what to do (B, personal communication, March 29, 2011), B gave an analogy about recovery in AA: "It is like you are in an airplane that is about to crash and you are freaking out because you are about to die; and your sponsor tells you to organize the papers in front of you" (March 29, 2011). This makes no sense. M and B agreed that they do not understand addiction, not do they understand the recovery process. But they work really hard at their recovery in AA because it keeps them sober.

Discussion

Based on the present research, addiction appears to be a complex disease that has multiple factors. A single approach or one defining feature cannot explain the nature of addiction; it is much too broad for that. There is no specific gene that predisposes a person to an addiction, nor is there one single childhood experience that will make a person develop an addiction. However, there are some striking correlations between brain anatomy, negative emotions, and the development of an addiction.

The data suggests that drug and alcohol addiction is at least in part a biological brain disease. The biological research shows differences at the functional and structural levels of the brains of addicted individuals in comparison to non-addicted individuals. Functionally, addicted brains appear to be more prone to physical cravings. The limbic activation found in the brains of addicted individuals strongly demonstrates the physiological cravings experienced in response to a cue (Childress, et al., 1999). The cue doesn't even have to be conscious to increase the blood flow and activation in the limbic region. The response is reflexive and automatic, with little or no override from the prefrontal cortex (Childress, et al., 1999).

Structurally, the addicted brain is also very different from the non-addicted brain. The loss of brain tissue and the molecular changes at the synaptic level signify major differences in the way addicted individuals respond to a drug. The loss of brain tissue found in chronic alcoholics (Spanagel & Heilig, 2005) has important implications involving the behavior of these individuals, especially because the majority of tissue loss

is found in the prefrontal cortex. Because of the specific behaviors associated with the prefrontal cortex, such as rational decision-making and impulse control, tissue loss in this area of the brain results in poor decision-making, irrationality, and the loss of control over one's impulses. With these brain deficits, it would make it much more difficult to quit drinking.

The loss of dopamine receptors (Spanagel & Heilig 2005) found in the brains of addicted individuals has implications for a loss of natural pleasure. With fewer dopamine receptors to respond, there may be an increased need to ingest drugs to obtain a normal response level from the dopamine. Individuals who are deficient in dopamine receptors may become dependent on their drug to achieve the normal levels of pleasure from daily life. The loss of dopamine receptors may contribute greatly to a drug dependency.

Brain processes are clearly involved in addictions. Although brain processes may not complete the picture of a drug and alcohol addiction, they play a significant role in the development of an addiction, and the long-term effects of an addiction.

The research suggested that there are emotional factors that contribute to a dependency on a drug. Based on the interviews conducted, it was noted by the individuals that they needed their drug or alcohol to feel "right" with the world (M and B, personal communication, March 29, 2011). Both of the women interviewed explained that for most of their lives they had felt negative emotions such as fear, anger, or not fitting in; and when they first experienced the effects of alcohol or drugs, these negative feelings disappeared (M and B, personal communication, March 29, 2011). "C" from Alcoholics Anonymous also explained how alcohol gave him strength and comfort that he had been lacking (Big Book Comes Alive, 1998). With the drug serving as such a necessity to

one's wellbeing and sense of wholeness, it is logical that an individual would form an emotional dependency on it.

Emotional trauma was also strongly correlated with substance abuse, as demonstrated in the ACE study (Dube et. al., 2003). The correlation shown in the data could be interpreted in a number of ways. The emotional trauma may have disturbed brain development, putting a person at-risk for developing an addiction. Or the emotional distress caused by the trauma may have produced negative feelings in the individual, which he or she medicated using drugs or alcohol. It was noted from a variety of sources that negative feelings such as fear, anger, resentment, shame, and isolation were associated with addiction (M and B, personal communication, March). It was also noted by P. Adams (2008) that addicted individuals had a tendency to view the world as a hostile place. This belief could result from traumatic childhood experiences.

Childhood trauma, negative emotions, and brain development are all related to one another. It cannot be teased out which factor causes the other, or which factor has the greatest influence on the development of a drug or alcohol addiction. From the data it can only be concluded that emotional disturbances are associated with the development of an addiction, and that biological brain processes also play a critical role.

The data also supported an underlying theme that an addiction is more powerful than the individual's will power. The first step in the Alcoholics Anonymous recovery program is to admit one's powerlessness over alcohol (2001). For the members of this program, they must acknowledge that their disease is more powerful than they are, and that they are powerless to control it. One of the men interviewed for his addiction to cocaine also said that he felt like he was living in "the grips of his addiction" (HBO

Addiction, 2007), and he acknowledged that he felt like he "lost the battle" with his addiction when he would use. This finding reinforces the idea that an addiction is a powerful disease from which the individual suffers. It appears that the individual doesn't have a choice in the matter; the addiction seems to be out of his or her control. This evidence is strongly suggestive that an addiction is in fact a disease, rather than a choice or lack of will power.

The question then remains: why do people believe that they can manage or control their addiction? The data strongly suggest that there is an illusion that an addiction can be controlled, either by the individual who suffers or by his or her family. The support group of Al-Anon, for example, is composed of the family and friends of alcoholics (*A Guide for the Family of the Alcoholic*, 2004). Part of the mission of this support group is to help its members realize that they cannot control alcoholism, they did not cause it, and they cannot cure it (*A Guide for the Family of the Alcoholic*, 2004). It appears that individuals with addiction problems also believe that they should be able to control their disease, as demonstrated from personal accounts of individuals with addiction problems. These individuals thought that they should be able to stop using, and then they felt like failures when they could not (Big Book Comes Alive, 1998).

There appears to be an illusion in our society, in families, and in individuals that an addiction can be controlled or managed. Perhaps for some it can. But the research shows that the biological and emotional factors that influence an addiction are so strong and pervasive that they cannot easily be managed by one's will alone. The physical cravings experienced by the individual, the physiological and emotional dependency the

individual develops on the drug, and the likelihood of a relapse all suggest that an addiction is a chronic disease with physiological symptoms.

This study had some methodological problems that may have influenced the validity of the results. Some of the research came from secondary sources rather than primary sources, relying too heavily on the opinions of medical professionals. The interview with the two women in recovery from alcoholism was conducted in a group setting, with the two of them together. Because of the conversational atmosphere, the women may have been influenced by what each other said. Also, four out of the five personal testimonies came from members of Alcoholics Anonymous. Their attitudes may have reflected the AA philosophy and biased their responses. The researcher had a personal bias as well because she had personal experience with addiction in her family, and this bias may have influenced the way the results were interpreted.

Further research is needed in order to more clearly understand the nature of drug and alcohol addiction. This study was extensive and broad, involving many perspectives, but the breadth may have sacrificed the depth of each perspective. Further research should perhaps focus on just the biology of addiction, or just the family response in order to narrow the focus.

The most valuable data from this study came from the personal testimonies of the individuals who had experience with an addiction. Future qualitative research, perhaps a grounded theory approach involving interviews with individuals who have personal experience with an addiction, would be extremely beneficial in further understanding the nature of this disease. Such individual perspectives on addiction would offer invaluable insights into understanding the complexities of this disease.

References

A.A. General Service Conference (1976). *Alcoholics Anonymous*. 4th ed. New York City: Alcoholics Anonymous World Services.

Adams, P. J. (2008). *Fragmented Intimacy: Addiction in a Social World*. New York City: Springer.

American Psychiatric Association: *Diagnostic and Statistical Manual on Mental Disorders*, Fourth Edition, Text Revison. Washington DC, American Psychiatric Association, 2000.

Begleiter, H., Porjesz, B., Bihari, B., & Kissin, B. (1984). Event-Related Brain Potentials in Boys at Risk for Alcoholism. *Science* 225: 1493-496.

Black, C. (1981). *Children of Alcoholics "It Will Never Happen To Me!"* New York: Ballantine.

Carnes, P. J. (1983). *Out of The Shadows: Understanding Sexual Addiction*. Minneapolis: CompCare.

Childress, A. R., Mozley, D., McElgin, W., Fitzgerald, J., Reivich, M., & O'Brien, C.P. (1999). Limbic Activation During Cue-Induced Cocaine Craving. *The American Journal of Psychiatry* 156 : 11-18. American Psychiatric Publishing, Inc., 1 Mar. 2011. Web. 9 Mar. 2011.

CSAM. (2010). Addiction Is a Brain Disease. *California Society of Addiction Medicine*. Web. 9 Feb. 2011. <http://csam-asam.org/pdf/misc/brain_disease.pdf>.

Daeppen, J., Landry, U., Pecoud, A., Decrey, H., & Yersin, B. (2000). A Measure of the Intensity of Response to Alcohol to Screen for Alcohol Use Disorders in Primary Care. *Alcohol & Aloholism* 35.6: 625-27.

Dewey, W. L. (2008). Addiction Research: A National Imperative. *Brain Health*. The Friends of the National Institute of Drug Abuse. Web. 16 Mar. 2011. <http://www.cpdd.vcu.edu/Pages/Index/Index_PDFs/TransitionPaperOctober2008.pdf>.

Dube, S. R., Felitti, V. J., Dong, M., Chapman, D. P., Giles, W. H., & Anada, R. F. (2003). Childhood Abuse, Neglect, and Household Dysfunction and the Risk of Illicit Drug Use: The Adverse Childhood Experience Study." *Pediatrics* 111: 564-72.

Engler, B. (2006). Human Relations. In C. Hartford, J. Potter, R. Berardy, F. Kilgo & K. Truncellito (Eds.) *Personality Theories* (pp. 175-203). Boston: Houghton Miffin.

Kalat, J. W. (2009). Synapses, Drugs, and Addictions. In J. Potter, R. Deljon, R. Rosenberg & N. Albert (Eds.) *Biological Psychology* (pp. 68-78). Belmont, CA: Wadsworth.

Kellermann, Reverend J. L.(2004). *A Guide for the Family of the Alcoholic*. Virginia Beach, VA: Al-Anon Family Group Headquarters.

Leshner, A. I. (1997). Addiction Is a Brain Disease. *Frontiers in Neuroscience: The Science of Substance Abuse* 278: 45-47. Science. Web. 1 Mar. 2011.

Mc.Q., & P., C. (speakers). April 4,1998. *Big Book Comes Alive*. Colombus, Georgia: Alcoholics Anonymous.

Rosenbloom, D. L., Volkow, N. (2008). *Coping with the Stigma of Addiction*. National Institute on Drug Abuse, National Institute on Alcohol Abuse and Alcoholism, and Robert Wood Johnson Foundation. Retrieved from <http://www.hbo.com/addiction/stigma/52_coping_with_stigma.html>.

Spanagel, R., & Heilig, M. (2005). Addiction and Its Brain Science. *Society for the Study of Addiction* 100:1813-822.

Volkow, N., McLellan, T., Rosenbloom, D., Willenbring M., Brady K., & Dennis, M. (2007). *Addicton*. Prod. HBO. HBO Documentary Films.