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### The Dichotomous Model of Substance Abuse: The Elephant in the Room

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### **Abstract**

Addiction can be defined as a repetitive use of a substance or drug that occurs despite any negative outcomes associated with its use. Substance use addiction affects many different areas of an individual's life, and is often associated with stigma which can result in shame, secrecy, or rejection. There are many theoretical models behind the etiology and maintenance of substance use addiction that include biological, sociological, physiological, and other factors. This investigation examines college-aged individuals' beliefs about which theoretical model best explains substance use addiction, and if those beliefs can be manipulated when presented with new or opposing information. This investigation also examines if familiarity with substance use addiction will influence which model is chosen. Results indicated that individual's beliefs were not easily manipulated when presented with new or opposing information and that familiarity was not a significant predictor of which model was chosen. Past research has shown that individuals with a substance use addiction can be easily manipulated in their beliefs about addiction and those beliefs remain stable over time. Other past research has also shown that familiarity is not a significant predictor for beliefs about addiction. The current literature about manipulation of beliefs is limited and inconsistent with the method and sample population used, so future research is needed to understand the stability of beliefs about addiction as well as the factors that can influence what model of addiction one believes.

*Keywords:* addiction, disease model, psychosocial model

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## **CHAPTER I: Review of the Literature**

### **What is addiction?**

Addiction can be defined as a repetitive use of a substance or drug that occurs despite any negative outcomes associated with its use (Burgess, 2016; Volkow, 2014; Volkow, Koob, & McLellan, 2016; West & Brown, 2013; World Health Organization, 2018). Substance use addiction is a major problem in modern society, because it affects many areas of people's lives. Substance abuse can lead to stringent policies and public health problems, including the spread of disease. The government has recently developed programs for public health problems, such as a syringe exchange, to help reduce substance use and prevent further transmission of disease, and research on addiction can help to inform these programs so that they can be most effective (Kovac, 2012; World Health Organization, 2018).

According to Kovac (2012), the public and government are working to understand the etiology and maintenance of drug addiction in order to put different policies into place that can promote awareness and preventative measures. It is important that these new laws and policies address different problems with drug and substance use, such as mental, emotional, and physical health (Kovac, 2012). It should be noted that those with an addiction are stigmatized in society for their lifestyles, meaning that they may face rejection, isolation, dishonesty, and even secrecy (Palamar, 2012). According to Hamilton, Mann and Noh (2011), it is not uncommon for people to distance themselves from addicts in fear, to

blame them for their unfortunate stance in life, and to feel that they are lacking some form of morality. Despite these difficulties, health care policies and therapeutic services can help combat stigma associated with drug addiction (Janulis, 2010).

The field of psychology struggles with fully understanding and describing addiction, because it is both complex and dense in nature (Meurk et al., 2014). Researchers are given the task of considering many factors including the etiology, maintenance, and consequences of addiction. There are several different theoretical models of addiction that cause great debate, because these models must take into account a wide range of biological, sociological, physiological, and other factors (Kovac, 2012). This can make understanding the cause of addiction overwhelming, which means that much more research is needed to understand the major details of substance use addiction.

In this investigation, I focus on substance abuse, which includes, but is not limited to, the abuse of tobacco, alcohol, marijuana, methamphetamine, cocaine, opioids, and other illicit drugs. Substance abuse refers to the persistent use of harmful substances including alcohol and illicit drugs such as cocaine (World Health Organization, 2018). These psychoactive substances can induce harmful effects on cognition (memory loss), behavior (impulsivity), and physiology (trembling) after repeated exposure (World Health Organization, 2018). Symptoms include a strong urge to use the drug, problems controlling how often the drug is being used, and using the drug in spite of any negative or harmful consequences, such as family or marital problems. Over time, someone who continues to use drugs will eventually build up a form of tolerance so that greater usage of that drug is necessary to obtain the same desired effect (World Health Organization, 2018). Not only do addicts have an increased tolerance for their specific drug of choice, but they also face

withdrawal symptoms if and when they decide to taper off an illicit drug. Often, the withdrawal symptoms result in numerous adverse effects, which lead users to relapse and to start using again in order to reverse those negative symptoms (Rodgers, 1994; World Health Organization, 2018).

Wise and Koob (2014) explain the role of positive and negative reinforcement in the development and maintenance of an addiction. Substance use can often lead to euphoria or relaxation that produces a “high” that activates the reward system of the brain. As a result, this positive reinforcement can cause someone to use again in order to have those same reactions. On the other hand, when someone tries to taper off a substance and experiences those adverse symptoms, it may cause them to relapse and to use that drug in order to feel better again. This is the result of negative reinforcement of substance use behavior and can, unfortunately, maintain their addiction (Wise & Koob, 2014).

There are many possible theories in society today that were developed to best explain what addiction is and how it is maintained. Psychology has developed multiple perspectives and theories of addiction, leaving us to choose the “right” model for our research. The most recent and controversial topic is that of the dichotomous model of drug addiction. This leaves researchers to decide if a brain disease or psychosocial model of addiction is the most accurate representation of substance use addiction (West & Brown, 2013).

### **Disease Model**

The disease model seems to be a slightly more popular view of addiction than is the psychosocial model. The brain disease model believes that an addicted person has no choice in drug use, because their brain has been taken over by these harmful chemicals (Wiens &

Walker, 2014). These harmful chemicals eventually cause physiological and structural changes in the brain, such that people can no longer control how much they use. The disease model is supported by research showing structural and functional changes in the brain in response to drug use (Volkow, Fowler, & Wang, 2003). Repeated substance use can also result in impairment or deficits in different areas of the brain including, but not limited to, our decision making, problem solving, language, and judgement (Wiens & Walker, 2014). Volkow (2014) would agree that these possible impairments resulting from prolonged drug use are important to study in adult users, but they also emphasize the need to focus on the effects of substance use on children and teens. Children's brains are still developing and can easily be damaged by foreign and toxic chemicals (Volkow, 2014). Even as teenagers, our brains are still maturing, and being exposed to substance use can have long-lasting, negative consequences. It is important to note that damage to the brain may not always be reversible, so these outcomes can be permanently detrimental (Volkow, 2014). This investigation includes participants from a college-aged population, because individuals in that population are still at an age at which their brains are still developing.

A great deal of biological research has been conducted to support the disease model. One study that was conducted by Volkow and colleagues (2003) used PET and fMRI imaging to show how different types of addiction, such as smoking cigarettes, meth, and cocaine, impact the brain. They conclude that there are neurochemical changes as well as changes in the reward and memory parts of the brain. More specifically, they found an increase in the neurotransmitter, dopamine, which is associated with the reinforcement aspect of drugs (Volkow et al., 2003).

With long-term drug abuse, dopamine levels decrease remarkably. This affects the prefrontal cortex of the brain, which is associated with memory and inhibition. This decrease in sensitivity to a natural reinforcer, such as food, as well as inhibition control may contribute to keeping someone in a state of addiction and may lead to relapse. Furthermore, fMRI imaging shows that when the prefrontal cortex becomes stimulated during use, the reward circuits of our brain are activated, leading to an increase in salience of that drug. This research supports the disease model, as it shows how changes in the brain can result in a lack of control and compulsive behavior (Volkow et al., 2003).

Other research in support of a disease model has shown how even moderate drug use can escalate to extreme cases of addiction. For example, one study used two groups of rats. The first group was given cocaine in moderation for a certain time period each day, whereas the second group of rats was given extended periods of access to cocaine (Ahmed & Koob, 1998). The first group showed a low and stable use of cocaine, while the second group, the group that had extended use of cocaine, experienced accelerated use over a few days and eventually developed a tolerance. Surprisingly, after a few weeks of not having the drug, the rats in the second group were introduced once more to cocaine and showed an even higher use of that drug than they had before. Thus, Ahmed and Koob (1998) demonstrated how the brain changes when exposed to drug use and their research can help us understand how people can go from recreational use to a full addiction.

Although many people support this disease model of addiction, there are people who oppose this view and who claim that neuroscience research may not actually provide the evidence needed to show that addiction is, in fact, a brain disease (Wiens & Walker, 2014). In fact, Wiens and Walker (2014) argue that it may be detrimental to follow a disease



model. They believe that putting the label of brain disease on addiction may encourage an increase in unwanted stigma and the use of medications, and that it may ignore any other social factors including etiology, maintenance, and the treatment of addiction. In other words, telling someone with a substance use disorder or addiction that they have a disease may take away their sense of responsibility over their behavior and may actually discourage them from seeking help, because they may believe that they will not be held liable for their actions (Wiens & Walker, 2014).

### **Psychosocial Theory**

In contrast to the disease model, the psychosocial theory focuses on social factors that contribute to addiction. The National Center on Addiction and Substance Abuse (2017) states that there are people who believe that addiction is more of a choice rather than a brain disease, and that our environment, with or without genetic predisposition, can contribute to the start of addiction. Many prefer the psychosocial theory to the disease model, because the psychosocial model leaves room for potential change and recovery, whereas the disease model is less optimistic and may lead to more stigma (Wiens & Walker, 2014).

**Socioeconomic status.** According to the Institute of Medicine (1997) as well as Social Learning Theory of Addiction Treatment (2017), people's views about illegal drugs are influenced by environmental factors, such as family and peers. Adolescents are often curious about drugs and alcohol and may begin using around close friends or even family. This is particularly risky, as drug use often runs in families (Institute of Medicine, 1997). Volkow and colleagues (2016) noted that while some risks of drug abuse can be genetic, it is not always known just how much genetic vulnerability interacts with the environment to result in addiction.

Specifically, socioeconomic status plays a role in addiction. Economic status can inform us of family structure, cultural norms, financial needs, and health. For example, The Institute of Medicine (1997) states that it is not uncommon for those in a lower economic class to have drugs readily accessible in their neighborhood. Drug use is also more socially acceptable among those in lower economic classes. Although not every person facing this situation will become addicted, when taking into account other factors (such as personality and/or prior usage), this will certainly increase the risk of addiction. It has been suggested that a child from a low economic status and lower income is more than twenty times likely to have experienced some form of abuse, such as neglect. Children who are considered under-privileged are more likely to come from difficult backgrounds, and the stress and unique circumstances that they face can damage their brain development, which may lead to difficulties with mental health and substance use (Burgess, 2016).

**Mental illness.** Mental illness affects people from all over the world, including all ethnicities, races, and genders. Some forms of mental illness are more common than others, but most are treatable and can have a good outcome with proper treatment. Mental illness and substance abuse are often co-occurring disorders with over seven million adults having comorbid disorders in 2014 (Substance Abuse and Mental Health Services Administration, 2010). Unfortunately, both mental illness and addiction can come with public stigma. Those with a substance use disorder are seen as both blameworthy and dangerous (Corrigan, Kuwabara, & O'Shaughnessy, 2009). The public's attitudes about substance abuse show the need for policies which can challenge the stereotypes and misconceptions surrounding substance abuse and addiction. More research needs to be done in this area in order to best inform these policies. This investigation will add to this research body by examining how

college-aged students view addiction and their common stereotypes. Results from this study can be used to help spread awareness and education about addiction.

**Personality factors.** Recently, research has begun to focus on which personality traits may lead to an increased risk for substance use. The big five personality traits, including openness, agreeableness, neuroticism, conscientiousness, and extraversion, are being studied to determine which traits are associated with a risk of addiction. Thus far, it has been determined that introversion, neuroticism, and low levels of constraint, are associated with addiction (Rettner, 2014). People who experience few positive emotions, who have trouble with anxiety and depression, and who respond poorly to stressors are more likely to look for a way to avoid negative emotions of everyday life and may turn to drugs for relief. While research is being done to understand how personality traits may relate to addiction, this does not mean this is the only influence, as both our genetics and environment interact simultaneously (Rettner, 2014).

### **Multi-model theory**

Still, others believe that neither the disease model nor the psychosocial models, alone, are sufficient in describing addiction. Some hold the view that starting to use a drug is a choice, but that over time that drug can cause enough damage that individuals can no longer make the choice to quit using that drug (The National Center on Addiction and Substance Abuse, 2017). Kovac (2012) and Rodgers (1994) tend to agree with both models of addiction and feel that addiction involves all different neurological, social, and environmental factors that constantly work together. It is very possible that we, as researchers, are too rigid in our thought processes to fully consider other models of addiction. That being said, both recent and classical work calls for the need to take a more

flexible approach in which we consider how all different factors are related and how they work together. Substance abuse may not just be a consequence of brain malfunction, but an interaction involving areas such as genetics, psychological distress, and sociocultural contexts (Heather et al., 2017; Institute of Medicine, 1997; Kovac, 2012; Rodgers, 1994).

The choice between the disease model and psychosocial model is reminiscent of a classic Indian parable, described by Kovac (2012). The parable begins with a group of people standing in the dark and touching an elephant in order to learn what it is like. Each of the men in the group is blind and each touch a separate part of the elephant. They all begin to argue and debate over what the elephant feels like, although they're all touching the same animal. Each of these men had a different perspective on a subject, but all were right in their understanding of what they felt. Similarly, addiction can be accurately described from multiple perspectives. The dichotomous perspective argues that scientists and researchers should combine multiple theories in order to create a more realistic model that includes all sides of addiction. In other words, each of these theories work together and are not mutually exclusive. A dichotomous model would allow researchers to take advantage of the strengths of each perspective.

### **Changing Perspectives of Addiction**

Given the drastically different perspectives that individuals may hold regarding their views of addiction, as well as the need to find common ground in these beliefs in order to best address the study and treatment of addiction, it becomes important to consider how malleable views of addiction may be over time. Schaler (1997) stated that beliefs about addiction can be manipulated and that factors such as personal experience, spiritual beliefs, and scientific findings can alter which model best fits the beliefs of different individuals.

Wiens & Walker (2014), similarly, showed evidence that addiction beliefs among problem drinkers can easily change, even with minimal exposure to information about addiction. That said, they also found that these changes in beliefs about addiction can remain constant over time, and that these beliefs are not generally subject to change on a moment-to-moment basis (Wiens & Walker, 2014). Thus, research in this area is conflicted. Furthermore, a limitation of the Wiens study is that the population consisted of those with mild to moderate alcohol addiction, meaning that the findings and their implications may not generalize to those with other forms of drug addiction or to individuals with inexperience with substance use. Therefore, more research is needed to determine the stability of beliefs about addiction.

### **Current Study**

While there is a great deal of research to describe addiction, the vast majority of it focuses on examining the knowledge and attitudes of individuals towards addiction and how these attitudes may influence whether they think more positively or negatively about someone with a drug addiction. This research is limited in that there were very low response rates, the majority of participants were older in age with higher education, and familiarity measures used did not provide in-depth information about participant familiarity.

For instance, one recent study examined Australian citizens' views of addiction to specific substances and whether or not they felt addiction was a result of a disease or brain disease (Meurk et al., 2014). Results showed that more than half of participants who thought that addiction had biological causes thought that addiction was an overall disease instead of solely a brain disease, which would involve having personal experience with addiction or otherwise being influenced by personal qualities. It is not surprising that the participants who felt that biology was the cause of addiction were more likely to agree with the brain disease

concept than those who believed more in social factors. Unfortunately, though this research, importantly, studied the public's view of addiction, it was limited by a familiarity measure that did not go in depth regarding knowledge and experience with different substance addictions (Meurk et al., 2014).

The current study uses a familiarity scale that examines familiarity with addiction, such as family history or usage among friends. This more-detailed measure will help to determine if people believe one model of addiction is more appropriate than another. This will also examine whether those who have more family history or friends with an addiction have more positive or negative attitudes toward addiction. A past study from Hamilton and colleagues (2011) also studied how exposure to family or friends with an addiction can impact attitudes towards those with a drug addiction. The results showed that differences in negative attitudes towards addiction between adolescents and older generations were explained not by just the adolescents' personal use, but also by their familiarity with friends who used drugs. Meurk and colleagues (2014) also examined some form of familiarity by supplying a survey instrument that asked participants if they knew someone personally who used drugs as well as if they did drugs themselves. Hamilton and colleagues (2011) had a sample population from grades 7-12 and Meurk and colleagues (2014) had participants mostly over age 65. The current investigation examines a new population consisting of college-age participants to better understand their unique views on addiction.

Furthermore, this research includes an experimental manipulation in order to determine the stability of an individual's beliefs about addiction in the face of new information. Including this manipulation involves people who may or may not have experience with substance use and is not be aimed at just one subgroup of addiction. While

Wiens and Walker (2014) provided manipulation statements online, this investigation's experimental manipulation takes place in a lab setting, which provides better experimenter control and increases the effectiveness of the manipulation. This ensures participants take the time to read the provided statements which would not be possible in an online manipulation.

In summary, this investigation is aimed at addressing many of the limitations of previous research by having a larger sample size, by including an experimental manipulation, and by including college-aged participants whose brains and views of addiction are still developing. Finally, this study aims to discuss the "elephant in the room" to determine whether or not it would be beneficial to adopt a dichotomous model of addiction.

## **Chapter II: Methodology**

### **Participants**

One hundred thirty seven participants, ranging from ages 18-28, contributed data to this investigation. There were a total of 100 females (73%) and 37 males (27%). Participants included 98 freshman (71.5%), 28 sophomores (20.4%), 7 juniors (5.1%), and 4 seniors (2.9%). There were a total of 83.3% Caucasian, 5.8% African American, 5.1% Bi-racial, 2.9% Asian, 1.4% Hispanic, and 1.4% other (eg., one participant marked “other” as Indian, while another participant marked “other” as Pacific Islander). Forty-two percent of participants stated that they have had personal experience with substance use, while 65% of participants stated that they know someone who has a substance use addiction. These students were enrolled in courses in the Psychology Department of a midsized Midwestern University. Participants were recruited via the online participant management system, SONA. Participants attended a 20-minute appointment in which they completed a demographics questionnaire, as well as three additional questionnaires including the Addiction Belief Inventory, Familiarity Scale, and Addiction Belief Scale. Participants did not receive compensation for their participation, but their participation in research was one way in which they could receive course credit for a research exposure requirement.

### **Procedure**



There were three separate groups to compare including the disease model group, psychosocial model group, and control group. Participants were randomly assigned to each of the three groups. Each participant received a survey packet with either a manipulation or control statement unknown to the experimenter, and participants from each of the three groups were intermixed within the same research sessions. Each group received the same questionnaires, and the only difference between the three groups was the experimental manipulation. Each participant first completed the demographics questionnaire. Participants in the three groups were then given the Addiction Belief Inventory (ABI) in the beginning of the session to know which view of addiction they embraced before any manipulation. After completion of the ABI, each participant was given the Familiarity Scale to determine their familiarity with, and exposure to, addiction. Following this, those in the disease and psychosocial group received the manipulation statements to read, and those in the control group read the neutral statement. These statements promoted either a disease or psychosocial model of addiction, and may or may not have reflected the participants' own personal views. Then participants were then given the Addiction Belief Scale (ABS) to complete. Lastly, all three groups completed the same ABI once more at the end of the session. The effect of this manipulation was examined by assessing differences in scores across groups on the ABI given before and after the manipulation, as well by assessing differences in scores across groups on the ABS.

### **Materials**

**Demographics.** Participants first completed a short demographic questionnaire (Appendix A). Age, sex, gender, year in school, and GPA were requested as well as information regarding familiarity and knowledge of addiction.

**Addiction Belief Inventory.** The Addiction Belief Inventory (ABI; Appendix B; Luke et al., 2002) consists of 30 Likert-type items used to evaluate personal beliefs and opinions about addiction and substance use problems. The ABI is separated into eight core beliefs including, but not limited to, “chronic disease”, “responsibility for recovery”, “coping”, and “moral weakness”. Scores in each category were used to determine if participants’ beliefs align more with a disease or psychosocial model of addiction (Luke, Ribisl, Walton, & Davidson, 2002 p.100). The scale ranges from 1, “strongly disagree” to 5, “strongly agree. Items in the ABI are short and are easily understandable to clients. The items reflect both alcohol and drug use. Some questions include “Alcohol/drugs are used to cope with stressful life situations” and “Addiction is a chronic disease that doesn’t get better. The only chance for management is abstinence” (Luke et al., 2002 p.100). This scale shows reliability, as it has good internal consistency (five of seven scales with an alpha of .70 or above) as well as test-retest reliability which has moderate stability. The correlation for each ABI subscale at time one to itself four months later at time two has an average of .46, with a range of .34 (Responsibility for Actions) to .55 (Inability to Control). Reliability of the measure in the current investigation was poor ( $\alpha = .51$ ).

Scores were calculated for each of the seven scales, which were then summed to create a total ABI score. Analyses in this investigation made use of this total score. Higher scores indicate higher believability while lower scores indicate lower believability in each area (Luke et al., 2002). Thus, higher scores are associated with a disease orientation, while lower scores are associated with a more psychosocial orientation.

**Familiarity Scale.** This scale was originally created by Corrigan, Markowitz, Watson, Rowan, & Kubiak (2003) to assess a person’s knowledge and personal experience

with mental illness. This scale is a 7-item questionnaire that examines awareness of mental health as well as exposure to people with a mental illness. Items are coded as 1 being yes, and 0 being no. Scores for familiarity with each substance were determined by summing the total number for all items presented on that scale, ranging from 0 as the lowest familiarity, to 7 as the highest familiarity. Then each scale score was summed in order to determine a total substance familiarity, and that total score was used in all subsequent analyses. Higher scores indicated higher familiarity with substances. The current study modified the original scale to replace “with mental illness” to “addicted to.....” and included examples such as alcohol, heroin, marijuana, opioids, etc. (Appendix C; Corrigan et al., 2003). Reliability of the measure in the current investigation was good ( $\alpha = .86$ ).

**Addiction Belief Scale.** Developed by Jeffrey A. Schaler, the Addiction Belief Scale (ABS; Appendix D; Schaler, 1997) examines the addiction versus the psychosocial (choice) model concept. The 18- item Likert-scale ABS asked participants to rate their level of agreement with statements about addiction. These items represent two different perspectives on etiology of addiction, including a way of coping with life or uncontrollable disease (Schaler, 1997; p.370). As was true for the ABI, higher scores indicate more belief in the disease model, while lower scores indicate more belief in the psychosocial model (Schaler, 1997). According to Schaler (1997), the ABS is extremely face valid and includes items such as “Addicts cannot control themselves when they drink or take drugs” and “Addiction has more to do with the environment people live in than the drugs they are addicted to” (p.371). Reliability of the measure in the current investigation was poor ( $\alpha = .51$ ).

**Manipulation Statements.** The experimental manipulation included statements from either the disease or psychosocial model of addiction (Appendix E). Participants in the disease model group received the disease model statement while those in the psychosocial model group received the psychosocial model statement. The control condition received the neutral statement. The inclusion of manipulation statements have been previously used in Wiens and Walker (2014) and were created to match each of the two models of addiction.

### **Hypotheses**

Given the previous research again, the following hypotheses were proposed for testing during this investigation:

**Hypothesis 1:** Individuals who were more familiar with addiction of substances would agree more with the psychosocial model, meaning that there would be a correlation between scores on the familiarity and addiction belief scales.

**Hypothesis 2:** Scores on the ABI would not differ during the beginning of the session, before the manipulation, but would differ across the three groups after the manipulation in that the disease condition would lean more towards the disease model and the psychosocial condition would lean more towards the psychosocial model.

**Hypothesis 3:** The ABS scores across all three groups would also differ after the manipulation.

### **Chapter III: Analysis**

To test the first hypothesis that individuals who were more familiar with addiction would agree more with the psychosocial model, I used a Pearson product-moment correlation to determine the strength of association between familiarity and scores on the ABS. For my second hypothesis, I conducted two separate ANOVAs. The first ANOVA compared the ABI scores across all three groups from the beginning of the session. A second ANOVA similarly compared scores across all three groups at the end of the session, after the experimental manipulation. Finally, a similar ANOVA was conducted to compare scores on the ABS across groups after the experimental manipulation.

## Chapter IV: Results

In order to test the first hypothesis, that individuals who were more familiar with addiction of substances would agree more with the psychosocial model, I computed a Pearson product moment correlation between familiarity and scores on the ABS. As can be seen in Table 1, this correlation was not significant, meaning that the hypothesis was not supported. Table 1 also provides the mean and standard deviation for each measure including the Addiction Belief Inventory before the manipulation statement, Familiarity scale, Addiction Belief Scale, and the Addiction Belief Inventory after the manipulation.

For the second hypothesis, a series of one-way ANOVAs were conducted to compare scores on the ABI across the three groups before and after the manipulation. I hypothesized that the three groups would not differ from one another before the manipulation, but that those primed with the disease-oriented manipulation statement would show more disease-orientation in the ABI given after the manipulation, and that those given the psychosocial manipulation statement would become more oriented with the psychosocial model. An analysis of variance showed that the scores on the ABI before the manipulation, as expected, were not significantly different from one another,  $F(2, 135) = 1.05, p = .35$ . The second one-way ANOVA was conducted to compare scores on the ABI across the three groups after the manipulation. An analysis of variance

showed that the scores on the ABI after the manipulation were, surprisingly, also not significant,  $F(2,134) = .30, p = .74$ , meaning that the hypothesis was not supported.

For the third hypothesis, another one-way ANOVA was conducted to compare the scores on the ABS across the three groups after the manipulation. The hypothesis that the ABS scores across all three groups would be different after the manipulation was not supported,  $F(2,135) = 2.51, p = .085$ . Because of this marginally significant finding, I conducted follow-up t-tests in order to determine the differences between individual groups on the ABS. Those in the disease manipulation condition scored marginally higher on the ABS than those in the psychosocial condition [ $t(91) = 1.89, p = .06$ ] and significantly higher than those in the neutral condition [ $t(91) = 2.10, p = .039$ ], but those in the neutral condition did not differ from those in the psychosocial condition [ $t(88) = .076, p = .94$ ]. This would suggest that those in the disease condition agreed more with the disease model of addiction as compared to the other two groups. A pictorial representation of the results of hypotheses 2 and 3 can be found below in Figure 1.

Due to a suggested analysis from a thesis proposal meeting, another post-hoc analysis was conducted to examine gender differences in the variables of interest. Men and women did not differ in their familiarity with substances [ $t(136) = -.81; p = .42$ ] or in their ABI scores after the manipulation [ $t(135) = 1.54; p = .13$ ], but they did differ in scores on the ABS [ $t(136) = 4.09; p < .001; m_{\text{women}} = 55.23; m_{\text{men}} = 50.72$ ] as well as scores on the ABI before the manipulation [ $t(136) = 2.92; p < .01; m_{\text{women}} = 28.31; m_{\text{men}} = 27.05$ ].

## **Chapter V: Discussion**

The purpose of this study was to examine college-aged students' views on substance use and addiction, and those factors, such as familiarity with substance use and exposure to information about substance use, that might influence their views of addiction. Importantly, this investigation examined the subject in ways that addressed holes in the current research literature. Namely, it allowed for investigation of the topic in college-aged students who, as adolescents, are still experiencing brain development. This is important because the prefrontal cortex, responsible for judgment and decision making, is still growing and developing, which, as described in the introduction, may leave them vulnerable to poor choices regarding substance use. It also allowed for an experimental manipulation in order to determine the immediate impact of exposure to addiction information on one's beliefs about addiction. Though not all hypotheses were supported, the current work provides important new information regarding student views of addiction.

The first hypothesis was that those who are more familiar with addiction of substances would agree more with the psychosocial model. The results indicated that there was not an association between familiarity and scores on the ABS. These results suggest that the level of familiarity was not associated with which model of addiction was chosen. These results are consistent with the study by Meurk and colleagues (2014) which also



found that familiarity with addiction was not a significant predictor of beliefs that addiction is a disease. Those authors used a familiarity measure to assess whether they, or someone close to them, had ever had a problem with alcohol or heroin. This current investigation examined further by assessing individual's familiarity with not just alcohol and heroin, but also marijuana and opioids. This measure also examined further one's familiarity outside of relatives such as in school, work, or out in the community. Even with those important additions, the current study did not find support for an association between familiarity and beliefs about addiction. This could suggest that having familiarity with multiple substances through multiple individuals may also not be associated with which model of addiction individuals choose.

The second and third hypotheses required the creation of manipulation statements, which were created using scientific findings and logical arguments, which have been shown in previous research to persuade individuals (Cacioppo & Petty, 1984). The goal of the manipulation was to persuade the participants to respond in a particular way based on how the information was presented. For instance, the disease model statement only involved scientific findings about that particular model and directly stated that addiction is a disease. The psychosocial model also stated scientific findings for its model and directly stated, "*Many argue that viewing drug addiction as a disease isn't only incorrect, it's also unhealthy*", which could influence the individual to choose this model over the disease model. Lastly, a neutral statement was created which did not provide scientific findings for either model, but did provide general statistics about drug use in Kentucky.

The second hypothesis was that the ABI scores across all three groups at the beginning of the session will be similar before the manipulation, but will result in differences across the three groups after the manipulation. The results indicated that scores on the ABI before the manipulation were similar, which indicates that random assignment worked, and that individuals in the three groups came in with similar views to one another before the manipulation. However, the three groups did not differ from one another after the manipulation, either. These results suggest that participants were not easily manipulated into changing their beliefs based on the manipulation statement given.

These results are inconsistent with Wiens and Walker's (2014) previous study, which found that manipulation statements were able to significantly change participants' views toward either the disease or psychosocial model of addiction. One of the reasons for this inconsistency could be the population of the sample provided. Wiens and Walker (2014) used predominantly male participants, ages 21-37, who had a mild to moderate substance use addiction but who had never been in treatment. In comparison, the current investigation utilized college-aged individuals (ages 18-28), largely female, who did not necessarily have personal use with substances.

Though there were not statistically significant differences in familiarity with substances between men and women in the current investigation, the average familiarity score for men (9.8) may have been statistically significantly higher than that of women (8.7) had the sample size been larger. Therefore the large proportion of female subjects, who were relatively unfamiliar with substances who participated in the study made the sample in the current investigation very different from sample in the original Wiens and Walker study. This could suggest that individuals who are younger in age and who have

less exposure to substance use addiction may not be as easily manipulated as those already vulnerable to the impact of their addiction.

These results were also inconsistent with Schaler (1997), who stated that beliefs about addiction can be manipulated and that factors such as personal experience, spiritual beliefs, and scientific findings can alter which model best fits the beliefs of different individuals. While this current study did not examine spiritual beliefs or go into depth about each individual's personal use of substances, the manipulation statements provided scientific findings that reflected either the disease or psychosocial model of addiction.

The third hypothesis was that ABS scores would differ between conditions, as the ABS was administered after the experimental manipulation. The results indicated that the ABS scores did not significantly differ, but there was a trend toward significance. Follow up t-tests showed that the disease model condition showed marginally higher scores compared to the psychosocial condition, and significantly higher scores as compared to the neutral condition. The neutral and psychosocial conditions did not show any differences from one another. Scores in the disease manipulation condition were higher, meaning that they reflected more disease orientation, as would be expected. It is unclear why this statement may have impacted participants more so than the psychosocial statement, but it could be related to how the disease model statement was written. This particular statement involved more neuroscience based evidence than did the other two conditions, and previous research suggests that brain-based information has the ability to effectively persuade others, as even logically tangential neuroscience information diffuses any arguments due to a higher source with perceived scientific credibility (O'Connor et al., 2012). Therefore, the disease-oriented statement may have been more

persuasive than the other statements, because of its inclusion of neuroscience-oriented statements.

The post-hoc analysis was conducted to examine gender differences in the variables of interest to this investigation. The results indicated that women scored higher on their initial ABI as well as on the ABS. This indicates that women scored more in favor of a disease orientation than did men. Meurk and colleagues (2014) also found that women were more likely than men to view addiction as a disease. That study, additionally, found that older women were even more likely than younger women to believe that addiction was a disease, so it is possible that there may have been even more enhanced effects in the current investigation if the sample were older.

One possible reason for women believing that addiction is a disease is that men are more likely to use all types of illicit drugs, including marijuana, and they have higher rates of use for both illicit drugs and alcohol as compared to women (NIDA, 2018). As described above, the men in the current investigation did not have statistically significant differences in their familiarity with substances, but it is possible that these differences may have been found with a larger sample size. This could suggest that men may have more experience with drug use and could understand more of the psychosocial factors rather than just biological factors that contributed to their own substance use addiction.

### **Limitations and Future Directions**

Though this study examined many important influences on college students' views of addiction, there are some limitations that should be addressed. For instance, this study included a small convenience sample of undergraduates in Psychology at a mid-western university. Having a small sample can limit the power of the overall analysis which can

decrease the ability to detect an effect when there is one to be detected. It would be beneficial to obtain a larger sample to help the study determine better averages, avoid errors associated with a small sample (type II error), and identify outliers that could skew the data. It would also be beneficial to have a sample consisting of other undergraduates from other universities and majors across the United States, so the findings can be more generalizable to other regions and college-aged individuals. The sample was also largely homogenous, primarily consisting of Caucasian freshmen women. These results may not generalize to students of other various genders or ethnicities. It may be beneficial to adopt a more diverse sample to help understand the beliefs of those from different cultures and backgrounds.

This study also examined familiarity with substance use, but it did not fully examine participants' personal use with substances. It is possible that having personal use with substances could influence one's views of addiction, even when familiarity with others' use was not. It is also possible that the information that people are taught in different addiction programs can support their perspective. Lastly, reliability on some measures, such as the ABI and ABS, were low, indicating that the participants may not have taken the study seriously. They may have been uncomfortable answering in-depth questions about their views on the topic or they may have been motivated only by the incentive of receiving research credit after study completion. It is possible that these measures did not measure what was intended. That said, the familiarity measure had an alpha of .86. This may be because those questions were asking for answers regarding others instead of their own personal views on the topic.

It is important to note that while the ABI was completed twice, before and after the manipulation statement, the ABS was only completed once after the manipulation. The pre-test/ post-test format of the ABI allowed for direct comparison of scores on the same measure before and after the manipulation, but participants may have responded similarly on both measures simply because they recognized the measure from earlier. In contrast, comparison of ABI and ABS scores helped to control for this error. Nevertheless, it is possible that more information could have been gained from administering the ABS both before and after the manipulation as well.

While this current investigation has limitations to examine, it is also important to understand how the findings of this study can be used to guide future research in the field of psychology. The overall results indicated that the manipulation statements employed did not influence participants' decision. It may be of benefit to explore other types of manipulation techniques besides appealing to reason or logic, such as story-telling, or appealing to emotions. Research suggests that these techniques can be even more persuasive than logic and scientific facts (Yeung, 2015).

The results of this study can also guide research into understanding more about the stability of individuals' beliefs about addiction. While this study examined the stability of beliefs over a very short period of time, it would greatly benefit the literature if this overall method could be changed to a longitudinal design so the beliefs could be examined among the same individuals over the course of several years. This study also found that women are more likely to consider addiction a disease. It is possible that having a small sample size that is a predominately female population could have downplayed the overall male

view point. In the future, a larger and more proportionate sample could be used to help understand the differences in beliefs between genders.

In short, the current investigation provided important information about the influences on college students' views on addiction, and it has provided considerable opportunity for future research to be conducted in the area. Importantly, it demonstrated that college students' views of addiction are resistant to manipulation. This has important implications for future initiatives meant to reduce stigma or otherwise alter public perception of addiction. Future research will allow for a better understanding of those factors that influence one's views of addiction, and will help us to better identify the metaphorical "elephant in the room".

## Appendix A –Demographics

**Age:** \_\_\_\_\_

**Sex (circle one):**            Male                            Female

**Gender (circle one):**    Male                            Female                            Other (Please  
Specify):

**Year in college (circle one):**    Freshman            Sophomore            Junior            Senior

**Ethnicity/Race (circle one):** Caucasian            African American            Native American  
Asian/Pacific Islander            Hispanic            Bi-racial            Other (please  
specify):

**GPA:** \_\_\_\_\_

**Are you familiar with the definition of addiction?**                            YES            NO

**Have you had any personal experience with substance use? (alcohol, marijuana, opioids, cocaine, etc)** YES            NO

**Do you know of anyone who suffers from a substance use addiction?**    YES

NO



## Appendix B- Addiction Belief Inventory

Please read the following and circle the answer that best corresponds to your thoughts.

**1. An addicted person can control their use.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**2. Alcoholics/addicts can learn to control their drinking/using.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**3. Addicted persons are capable of drinking/using drugs socially.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**4. Treatment can allow alcoholics/addicts to drink/use socially.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**5. A drinking or drug problem can only get worse.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**6. Recovery is a continuous process that never ends.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**7. To be healed addicted persons have to stop using all substances.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**8. Alcoholism/drug abuse is a disease.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**9. Alcoholics/addicts are not capable of solving their drinking/drug problem on their**

**own.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**10. An alcoholic/addict must seek professional help.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**11. A recovering addict should rely on other experts for help and guidance.**

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

**12. An alcoholic/addict should not be held accountable for things they do while drunk/high.**

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

**13. It is not an alcoholic/addict's fault they drink/use.**

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

**14. Alcoholics/addicts are not responsible for things they did before they learned about their addiction.**

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

**15. Alcoholics/addicts are responsible for their recovery.**

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

**16. Only the alcoholic/addict themselves can decide when to stop drinking/using drugs.**

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

**17. Ultimately, the addict is responsible to fix him/herself.**

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

**18. Some people are alcoholics/addicts from birth.**

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

**19. Alcoholism/drug addiction is inherited.**

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

**20. Children of alcoholics/addicts who drink or use drugs will become alcoholics/addicts.**

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

**21. An addicted person uses alcohol/drugs to avoid personal problems.**

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

**22. People use drugs/alcohol to feel better about themselves.**

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

**23. People use substances to lessen their depression.**

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

**24. Alcoholics/addicts use because they cannot cope with life.**

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

**25. Alcoholics/addicts use substances to escape from bad family situations.**

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

**26. Abusing alcohol/drugs is a sign of personal weakness.**

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

**27. Alcoholics/addicts are personally responsible for their addiction.**

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

**28. Relapse is a personal failure.**

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

**29. Alcoholics/addicts start drinking/using because they want to.**

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

**30. It is their fault if an alcoholic/addict relapses.**

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

## Appendix C- Familiarity Scales

Please read the following statements and circle the answer that best corresponds to your thoughts.

### Familiarity (Alcohol)

**1. My school provides services/treatments for individuals addicted to alcohol.**

YES

NO

**2. I have observed, in passing, a person I believe may have been addicted to alcohol.**

YES

NO

**3. I have observed a person addicted to alcohol on a frequent basis.**

YES

NO

**4. I have worked with a person who was addicted to alcohol.**

YES

NO

**5. A friend of the family is addicted to alcohol.**

YES

NO

**6. I have a relative who is/was addicted to alcohol.**

YES

NO

**7. I have lived with a person addicted to alcohol.**

YES

NO

**Familiarity (Marijuana)**

**1. My school provides services/treatments for individuals addicted to marijuana.**

YES

NO

**2. I have observed, in passing, a person I believe may have been addicted to marijuana.**

YES

NO

**3. I have observed a person addicted to marijuana on a frequent basis.**

YES

NO

**4. I have worked with a person who was addicted to marijuana.**

YES

NO

**5. A friend of the family is addicted to marijuana.**

YES

NO

**6. I have a relative who is/was addicted to marijuana.**

YES

NO

**7. I have lived with a person addicted to marijuana.**

YES

NO

**Familiarity (Heroin)**

**1. My school provides services/treatments for individuals addicted to heroin.**

YES

NO

**2. I have observed, in passing, a person I believe may have been addicted to heroin.**

YES

NO

**3. I have observed a person addicted to heroin on a frequent basis.**

YES

NO

**4. I have worked with a person who was addicted to heroin.**

YES

NO

**5. A friend of the family is addicted to heroin.**

YES

NO

**6. I have a relative who is/was addicted to heroin.**

YES

NO

**7. I have lived with a person addicted to heroin.**

YES

NO

**Familiarity (Opioids-pills)**

**1. My school provides services/treatments for individuals addicted to opioids.**

YES

NO

**2. I have observed, in passing, a person I believe may have been addicted to opioids.**

YES

NO

**3. I have observed a person addicted to opioids on a frequent basis.**

YES

NO

**4. I have worked with a person who was addicted to opioids.**

YES

NO

**5. A friend of the family is addicted to opioids.**

YES

NO

**6. I have a relative who is/was addicted to opioids.**

YES

NO

**7. I have lived with a person addicted to opioids.**

YES

NO

### Appendix D- Addiction Belief Scale

Please read the following statements and circle the answer that best corresponds to your thoughts.

**1. Most addicts don't know they have a problem and must be forced to recognize that they are addicts.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**2. Addicts cannot control themselves when they drink or use drugs.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**3. The only solution to drug addiction and/or alcoholism is treatment.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**4. The best way to overcome addiction is by relying on your own willpower.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**5. An addiction is an all-or-nothing disease: A person cannot be a temporary drug addict with a mild drinking or drug problem.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**6. People can stop relying on drugs and alcohol as they develop new ways to cope with life.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**7. Addiction has more to do with the environments people live in than the drugs they are addicted to.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**8. People often outgrow drug and alcohol addiction.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**9. The most important step in overcoming an addiction is to acknowledge that you are powerless and can't control it.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**10. Abstinence is the only way to control alcoholism/drug addiction.**



(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**11. Physiology, not psychology, determines whether one drinker will become addicted to alcohol and another will not.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**12. Alcoholics and drug addicts can learn to moderate their drinking or cut down on their drug use.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**13. People become addicted to drugs/alcohol when life is going badly for them.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**14. The fact that alcoholism runs in families means that it is a genetic disease.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**15. You have to rely on yourself to overcome an addiction such as alcoholism.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**16. Drug addicts and alcoholics can find their own ways out of addiction, without outside help, giving the opportunity.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**17. People who are drug addicted can never outgrow addiction and are always in danger of relapsing.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

**18. Drug addiction is a way of life people rely on to cope with the world.**

(1) Strongly disagree    (2) Disagree    (3) Neutral    (4) Agree    (5) Strongly Agree

## Appendix E- Manipulation Statements

### Disease model statement:

Drug addiction is a disease that affects your brain and behavior. When you're addicted to drugs, you can't resist the urge to use them, no matter how much harm the drugs may cause. Drug addiction isn't about just heroin, cocaine, or other illegal drugs. You can get addicted to alcohol, nicotine, opioid painkillers, and other legal substances (Goldberg, 2018).

The drugs that may be addictive target your brain's reward system. They flood your brain with a chemical called dopamine. This triggers a feeling of intense pleasure. So you keep taking the drug to chase that high. You may think you can control how much and how often you use it. But over time, drugs change how your brain works. These physical changes can last a long time. They make you lose self-control and can lead you to damaging behaviors (Goldberg, 2018).

Addiction is when you can't stop. Not when it puts your health in danger. Not when it causes financial, emotional, and other problems for you or your loved ones. That urge to get and use drugs can fill up every minute of the day, even if you want to quit (Goldberg, 2018).

Adapted from:

Goldberg, J. (2018). What Is Drug Addiction? Retrieved from <https://www.webmd.com/mental-health/addiction/drug-abuse-addiction#1>

**Psychosocial model statement:**

Many argue that viewing drug addiction as a disease isn't only incorrect, it's also unhealthy. They insist, as humans, we always have a choice. Taking things a step further, they also point out that, if we really had no say in the matter, no one would ever recover. But they do recover and it's made possible by knowing that we have a choice to stop using (Nenn, 2016).

How could it not be a choice? It's an external behavior. It requires the choosing of certain actions. Addiction isn't something that simply sneaks up and attacks the body. It may become internal, as it changes a person's physiology over time. Yes, these changes can make it hard to quit. But, everyone has a choice to take that first drink, or pop that first pill. And, every day, people make the choice to stop (Nenn, 2016).

Factors to consider when thinking about drug addiction include personality, socioeconomic status, mental illness, as well as family, peer, and other environmental factors that can increase the risk of an individual developing an addictive disorder or decrease such risks.

Adapted from:

Nenn, K. (2016). Point/Counterpoint: Is addiction a disease or a choice? Retrieved from <https://www.rehabs.com/pointcounterpoint-is-addiction-a-disease-or-a-choice/>

**Neutral Statement:**

Drug abuse results in behavioral and biological health issues that affect individuals, families, and communities. Economic estimates indicate consequences from drug abuse (including alcohol, tobacco, prescription, and illicit drugs) approach 20% of our federal budget. Drug use is also highly correlated with crime, making the drug issue one of public health and safety (DrugAbuse, 2018).

Drug addiction has reached epidemic levels in Kentucky, where painkiller and heroin abuse are rampant. Kentucky is all too familiar with heroin overdoses, especially Northern Kentucky, Louisville, and Lexington, raising fears that heroin will soon ravage the entire Commonwealth. Devastating consequences of the opioid epidemic include increases in opioid misuse and related overdoses, as well as the rising incidence of newborns experiencing withdrawal syndrome due to opioid use and misuse during pregnancy (Office of Drug Control Policy, 2018).

Opioid overdoses increased by roughly 30% across the US in just 14 months between 2016 and 2017. To curb the crisis, officials said communities would need more naloxone (which reverses overdoses); better access to mental health services and medication-assisted addiction treatment; harm reduction programs to screen for injection-drug associated diseases such as HIV and hepatitis C; and for physicians to use prescription monitoring services (Glenza, 2018).

Adapted from:

Glenza, J. (2018). Opioid crisis: Overdoses increased by a third across US in 14 months, says CDC. *The Guardian*. Retrieved from <https://www.theguardian.com/us-news/2018/mar/06/opioid-crisis-overdoses-increased-by-a-third-across-us-in-14-months-says-cdc>.

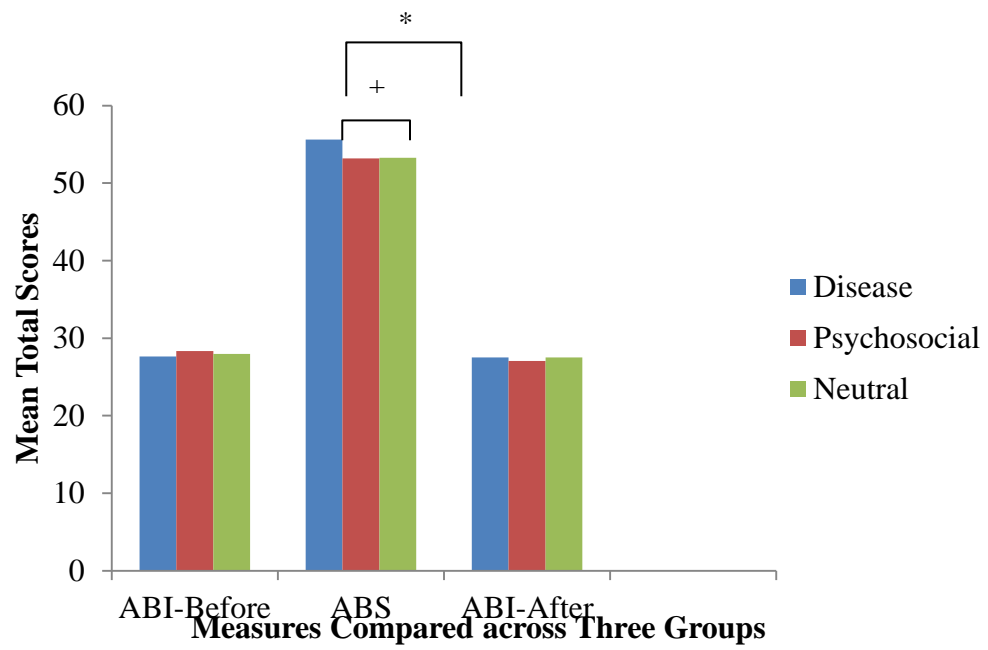
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## Appendix F: Figures and Tables

Table 1  
*Descriptive Statistics and Correlations Among Variables of Interest*

	ABI Before	ABS	Familiarity	ABI After
ABI Before	1			
ABS	.329**	1		
Familiarity	.114	.091	1	
ABI After	.488**	.358**	.065	1
Mean	27.98	54.05	8.97	27.36
SD	2.30	6.00	5.25	3.31
Min	22.23	38	0	0
Max	33.51	68	26	33.35

*Note.* \*\*. Correlation is significant at the 0.01 level (2-tailed)



Note. \*  $p < .05$ ; +  $p < .07$

Figure 1. Comparison of ABI scores across three groups before and after a manipulation and ABS scores after the manipulation.

## Appendix G: IRB Approval



**MURRAY STATE**  
UNIVERSITY

### Institutional Review Board

328 Wells Hall  
Murray, KY 42071-3318  
270-809-2916 • msu.irm@murraystate.edu

TO: Amanda Joyce  
Psychology

FROM: Institutional Review Board  
Jonathan Baskin, IRB Coordinator 

DATE: 8/16/2018

RE: Amendment to Human Subjects Protocol I.D. – IRB # 18-161

The IRB has completed its review of the amendment submitted for your student's Level 1 protocol entitled *Attitudes and Substance Abuse*. After review and consideration, the IRB has determined that the changes, as described in the amendment application, will be conducted in compliance with Murray State University guidelines for the protection of human participants.

The updated forms and materials that have been approved for use in this research study are attached to the email containing this letter. These are the forms and materials that must be presented to the subjects. It is your responsibility to ensure that only the updated materials are used from this point forward. Use of any process or forms other than those approved by the IRB will be considered misconduct in research as stated in the MSU IRB Procedures and Guidelines section 20.3.

This amended Level 1 protocol is valid until 5/6/2019.

If data collection and analysis extends beyond this time period, the research project must be reviewed as a continuation project by the IRB prior to the end of the approval period, 5/6/2019. You must reapply for IRB approval by submitting a Project Update and Closure form (available at [murraystate.edu/irm](http://murraystate.edu/irm)). You must allow ample time for IRB processing and decision prior to your expiration date, or your research must stop until such time that IRB approval is received. If the research project is completed by the end of the approval period, then a Project Update and Closure form must be submitted for IRB review so that your protocol may be closed. It is your responsibility to submit the appropriate paperwork in a timely manner.

You may begin data collection using the approved changes.

Opportunity  
afforded

[murraystate.edu](http://murraystate.edu)



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