LAY PERCEPTIONS OF BEHAVIORAL AND SUBSTANCE ADDICTIONS

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ABSTRACT

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The purpose of this study was to assess the American lay public’s willingness to affiliate with and their perceptions of the definition, etiology, and treatment of either one of two specific types of behavioral addiction (i.e., pornography or gambling) or one of three types of substance addiction (i.e., alcohol, marijuana, or heroin). Using the Amazon Mechanical Turk online subject pool, I recruited 612 participants who were randomly assigned to one of five experimental conditions listed above. Most participants were young ($M=34.3$, $SD = 11.2$), white (79%), college educated (72%), employed (70%), and had never married (57%). Participants were generally unwilling to affiliate with an individual with any of these five types of addiction. In addition, participants rated heroin as the most addictive, yet rated all five addictions as consisting of both Compulsive and Appetitive elements. Also, participants agreed that both psychosocial and biomedical factors were causes of each addiction, and generally rated treatment as beneficial for each of the five addictions. Results suggest that lay attitudes regarding etiology and treatment are consistent with many professionals’ opinion that all addictions are multi-determined and that all addictions are treatable.

Keywords: stigma, behavioral addiction, substance addiction, adults, lay public
Dedicated to all those who have experienced addiction.
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INTRODUCTION

In 2013, nearly one quarter of American adults reported binge drinking in the past month, and approximately six percent of adults met criteria for alcohol abuse or dependence in the previous year (Substance Abuse and Mental Health Services Administration [SAMHSA], 2014). Excessive alcohol use is associated with and exacerbates many medical conditions, including cirrhosis of the liver, coronary heart disease, stroke, liver cancer, epilepsy, mouth cancer, and many others (Room, Babor, & Rehm, 2005). Furthermore, alcohol use is associated with increased unintentional injuries including motor vehicle accidents, drownings, falls, poisonings, and violent crime (Room et al., 2005).

Among all of the illicit drugs, marijuana/cannabis is the most commonly used and abused substance in the United States (SAMHSA, 2014). In 2013, approximately two percent of Americans age 12 and older met criteria for cannabis abuse or dependence in the previous year (SAMHSA, 2014). In terms of psychosocial harms, several longitudinal studies have reported consistent associations between marijuana use and lower educational achievement (Macleod et al., 2004). Although the findings are mixed, several studies have supported a relationship between smoking marijuana and both increased tar exposure and premalignant lung cancer (Mehra, Moore, Crothers, Tetrault, & Fiellin 2006). However, the vast majority of marijuana users experience few consequences, and addiction experts have rated marijuana as less harmful than either alcohol or heroin (Nutt, King, & Phillips, 2010). Nevertheless, approximately nine percent of cannabis users will develop cannabis dependence in their lifetime (Hall & Degenhardt, 2009). Cannabis dependence is characterized by tolerance, high rates of relapse, and withdrawal symptoms (Hall & Degenhardt, 2009). Symptoms of marijuana withdrawal can occur for up to
fourteen days after cessation and may include sleep difficulty, irritability, sweating, decreased appetite, shakiness, and anxiety (Budney, Moore, Vandrey, & Hughes, 2003).

Unlike drinking and marijuana use, heroin use in the U.S. is quite uncommon, with past-month heroin use estimated at only about 0.1 percent of the population (SAMHSA, 2014). Nevertheless, excessive heroin use carries significant health consequences, including respiratory depression, coma, pulmonary edema, and death (Borg, Kravets, & Kreek, 2009; Tetrault & O’Connor, 2009). Furthermore, intravenous injection of heroin is associated with increased rates of HIV, Hepatitis B and C, and bacterial infections such as endocarditis, cellulitis, and botulism (Borg et al., 2009). Also, immediate cessation of heroin by heavy users may lead to acute withdrawal symptoms, including craving, GI distress, insomnia, anxiety, dysphoria, and muscle and joint pain (Tetrault & O’Connor, 2009). In terms of social harms, many opioid dependent individuals report engaging in criminal behavior including violence, drug-impaired driving, and crimes for monetary gain (Soyka et al., 2012).

Over the past decade, clinicians and researchers have argued for the application of the concept of addiction to selected behavioral activities (e.g., gambling, pornography, Internet games) as well as to the consumption of alcohol and drugs (Grant, Potenza, Weinstein, & Gorelick, 2010). There are many similarities between the symptoms indicative of behavioral addictions and the symptoms of substance use disorders (SUDs), including loss of control, compulsion, and craving (Grant et al., 2010). Similar to those with a SUD, individuals with a behavioral addiction are characterized by high levels of both impulsivity and sensation-seeking (Grant et al., 2010; Karim & Chaudhri, 2012). Also, both behavioral addictions and SUDs often begin during adolescence or early adulthood, and many people with both types of addictive disorders experience natural recovery (Grant et al., 2010).
Furthermore, similar to those with SUDs, individuals with behavioral addictions report both initial pleasure from performance of the behavior and subsequent craving to engage in the behavior (Grant et al., 2010; Karim & Chaudhri, 2012). In addition, behavioral addictions are characterized by increasing frequency of engaging in the addictive behavior to achieve positive effects (i.e., tolerance) and psychological withdrawal symptoms following cessation of the behavior (Grant et al., 2010; Karim & Chaudhri, 2012). Another similarity between SUDs and behavioral addictions is the assumption that both are reinforcing due to increased dopamine release in the mesolimbic pathway from the ventral tegmental area to the nucleus accumbens (Grant et al., 2010; Karim & Chaudhri, 2012). Despite these similarities, those with behavioral addictions do not typically experience the clinically significant physiological symptoms upon cessation that are observed in people with SUDs (Grant et al., 2010).

There are a wide variety of potential behavioral addictions, including shopping addiction, pathological gambling, Internet addiction, hypersexuality, binge eating, and videogame addiction (Karim & Chaudhri, 2012). However, professionals disagree considerably about which problematic behaviors should be labeled behavioral addictions (Black, 2013). One about which there is considerable agreement is Pathological Gambling. In fact, Pathological Gambling is currently listed in the Substance-Related and Addictive Disorders section of the Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (DSM-5; American Psychiatric Association, 2013).

According to the DSM-5, Pathological Gambling is characterized by symptoms of preoccupation with gambling, impaired control over gambling (e.g., multiple failed quit attempts, “chasing” losses), tolerance, psychological withdrawal, lying about gambling, losing a job or relationships, and borrowing money from others (American Psychiatric Association, 2013).
Although the vast majority of individuals who gamble experience no negative consequences, a recent literature review concluded that approximately 2 percent of Americans will meet the criteria for Pathological Gambling in their lifetime (Ashley & Boehlke, 2012).

Pathological Gambling is associated with a variety of psychosocial problems, including increased rates of crime, bankruptcy, and suicide attempts (Ashley & Boehlke, 2012). In addition, Pathological Gambling is characterized by high rates of natural recovery in about one-third of individuals who meet diagnostic criteria (Ashley & Boehlke, 2012). Despite the application of various psychotherapies, relapse rates within the first year after treatment range from 80 to 90 percent (Ashley & Boehlke, 2012). Despite its relatively low prevalence in the general population, the clinically significant negative consequences associated with Pathological Gambling warrant its further investigation and treatment.

Although Pathological Gambling is included as a mental disorder in DSM-5, the validity of other behavioral addictions has been disputed. For example, Kafka (2010) proposed sexual addiction or hypersexuality as a “normophilic” sexual disorder for inclusion in DSM-5. Unlike the paraphilias currently included in DSM-5 (e.g., fetishism, exhibitionism, voyeurism, sexual sadism, pedophilia), Hypersexual Disorder is defined as sexual fantasies, urges, or behaviors that would not otherwise be considered deviant except that they are engaged in excessively, cause distress and/or impairment, and appear uncontrollable. Within the broader domain of Hypersexual Disorder, Kafka (2010) also proposed specifiers such as masturbation, pornography, and sex with consenting adults. Other researchers have argued that Kafka’s definition pathologizes normative sexual behavior and that the extant research fails to support the notion that hypersexuality is necessarily maladaptive (Wakefield, 2012).
Hypersexuality has been defined in a variety of ways and conceptualized as a behavioral addiction, an impulse-control disorder, an obsessive-compulsive disorder, and a sexual desire disorder (Kafka, 2010). Kafka’s (2010) review also noted the associations between hypersexuality and increased risk of both sexually transmitted diseases and unintended pregnancies. Furthermore, several studies have noted the frequent comorbidity between hypersexuality and mood disorders, anxiety disorders, and SUDs (Kafka, 2010; Kor, Fogel, Reid & Potenza, 2013).

Several features of hypersexuality support conceptualizing it as a behavioral addiction. For example, individuals with hypersexuality disorder report initial pleasure from the behavior, excessive time spent on sexual behaviors, impaired control, and psychosocial consequences such as excessive money spent on sexual activities (Kafka, 2010; Kor et al., 2013). Furthermore, Kor et al. (2013) concluded that hypersexuality often begins during late adolescence, involves an escalation of behavior, and involves urges that are difficult to control. Finally, past research has found that individuals meeting criteria for hypersexuality continue to engage in unprotected sex despite adverse consequences such as being HIV positive (Benotsch, Kalichman, & Pinkerton, 2001).

Similarly to Pathological Gambling, the negative psychosocial consequences associated with hypersexuality appear both more prevalent and severe than those associated with other behavioral addictions such as Internet addiction, shopping addiction, or videogame addiction. Therefore, although debate continues about whether to include sex addiction as a mental disorder, I found the arguments sufficiently compelling to include pornography as one of the two behavioral addictions in my study comparing lay attitudes of substance use disorders and behavioral addictions.
Lay Theories of Addiction

Haslam et al. (2007) posited that lay people actively construct theories of mental illness along pathologizing, moralizing, medicalizing, and psychologizing dimensions. According to Haslam et al.’s (2007) “folk psychiatry model,” laypeople first judge a set of “abnormal” behaviors along a pathologizing dimension. The pathologizing dimension includes a judgment that the behaviors are statistically infrequent in the population and the perception that the behaviors are due to causes within the individual. Furthermore, Haslam et al. (2007) posit that the pathologizing dimension involves labeling an individual with their disorder. In this model, once a person with a mental illness is “pathologized,” the layperson then judges the etiology of the disorder along the moralizing, medicalizing, or psychologizing dimensions. These latter three dimensions involve the layperson’s assignment of causation for the abnormal behaviors to intentional moral failings, unintentional somatic sources, or psychological mechanisms, respectively. Similar to these lay theories, academic theories usually focus on a combination of psychosocial and biological/genetic causal factors (Furnham, 2012).

In support of Haslam’s folk psychiatry model, research regarding the lay public’s conceptualization of mental illness has found that lay individuals hold theories about the definition, etiology, prognosis, and treatment of mental illnesses (Furnham, 2012; Haslam, Ban, & Kaufmann, 2007). Furthermore, some members of the lay public hold prejudicial attitudes about and engage in discriminatory behavior toward those individuals labeled with a negative characteristic (stigma) such as mental illness (Corrigan, 2004). Stigmatization of those with mental illness occurs when people adopt prejudicial attitudes based primarily or exclusively on someone having a disorder rather than on an individual’s specific behavior. Such attitudes are
unrealistic because they assume the presence of negative characteristics and fail to recognize variability among those with the stigmatized condition.

Although scientific theories probably hold more promise for the development of diagnostic systems and treatment interventions, lay theories may explain stigmatization of the mentally ill by the general public. For example, one line of research comprises studies of whether presumed causes of mental illness impact lay people’s feelings (e.g., anger, pity, etc.) and their willingness to affiliate with the mentally ill.

In one experimental test of this approach, Corrigan, Markowitz, Watson, Rowan, & Kubiak (2003) randomly assigned participants to read vignettes about an individual with schizophrenia and then assessed their attitudes toward the patient. In their vignettes, Corrigan et al. (2003) varied information regarding the cause of the schizophrenia (i.e., caused by traumatic brain injury versus substance abuse). The results supported their hypothesis that an etiology over which patients had control (i.e., substance use) led to stronger beliefs about personal responsibility for the illness, which in turn led to less pity and more anger (Corrigan et al., 2003). They also found that these feelings were associated with support for coercive treatment and unwillingness to interact socially with a member of a specified group (Corrigan et al., 2003). Thus, in their sample, the public’s perception of the etiology of the mental illness was associated with both emotional responses and behavioral intentions toward the individual with mental illness.

Many anti-stigma researchers have proposed that reframing mental illness as a medical disease will decrease perceived controllability and associated stigmatization (Pescosolido, 2013). To test this proposition, Pescosolido et al. (2010) examined the results of nationally representative surveys of American adults conducted in 1996 and 2006, which used vignettes of
targets with depression, schizophrenia, or alcohol dependence. Their analysis revealed that belief in a neurobiological etiology of mental illness was associated with more support for treatment, but was unrelated to stigmatization as measured by willingness to affiliate (Pescosolido et al., 2010).

Unlike Pescosolido (2013), some researchers have hypothesized that genetic accounts of mental illness will increase rather than decrease stigmatization (e.g., Phelan, 2005). In her survey of a nationally representative sample, Phelan (2005) found that genetic accounts of mental illness were associated with increased perceptions of persistence and seriousness of the mental illness, but were unrelated to social distance/willingness to affiliate with those with mental illness. Given these mixed results, the relationship between perceived etiology and stigmatization is not yet fully understood and is likely more complex than originally thought.

Past research has demonstrated several areas of discrimination or behavioral actions against those with mental illness (Corrigan, 2004). For example, individuals with a diagnosed mental illness are less likely to be hired, less likely to obtain housing, less likely to receive medical services, more likely to be arrested, and spend more time incarcerated than those without mental illness (Corrigan, 2004). These forms of discrimination may lead those with mental illness to avoid seeking evaluation and treatment that would identify them as having a mental illness (Corrigan, 2004).

Past research has also found that the public endorses different levels of stigmatization depending on the specified mental illness (Pescosolido et al., 2010; Crisp, Gelder, Rix, Meltzer, & Rowlands, 2000). For example, Pescosolido et al. (2010) compared American adults’ perceptions of alcohol dependence with their perceptions of schizophrenia and major depression. In their study, American adults were more likely to attribute alcohol dependence to “bad
character,” more likely to rate alcohol dependent targets as violent to others, and were less willing to interact socially with alcohol dependent targets. Similarly, results of several cross-cultural studies have revealed that alcohol dependence provokes more social rejection, more negative emotions, higher levels of discrimination, and more blame than other psychiatric illnesses (Schomerus et al., 2010). Regarding stigma of alcohol and drug addiction, Crisp et al. (2000) compared British adults’ perceptions of depression, panic attacks, schizophrenia, dementia, eating disorder, alcohol addiction, and drug addiction. They found that the British public was more likely to blame drug addicted targets for causing their disorder and were more likely to view drug addicted targets as dangerous to others and unpredictable. In light of these findings, research on lay theories of mental illness should evaluate perceptions of specific forms of mental illness rather than asking about mental illness not otherwise specified.

Of most relevance to my proposed thesis, several studies have focused on lay perceptions of people with substance addiction. For example, Chassin, Presson, Rose & Sherman (2007) examined differences in subjective definitions of tobacco addiction among adolescents and adults. To assess the specific elements people might see as components of addiction, Chassin et al. asked both parents and teenagers to rate how much they agreed that 17 specific behaviors were indicative of an addiction to cigarettes. Based on factor analyses, Chassin et al. (2007) concluded that the 17 behaviors comprised two subscales representing “appetitive” and “compulsive” dimensions of addiction. The “appetitive” subscale included items such as “getting high,” “liking the behavior a lot,” and “doing the behavior even if they could get in trouble.” Overall, items on the “appetitive” subscale reflected themes of appetitive drive and continued use of tobacco despite negative consequences. The “compulsive” subscale included items such as “not being able to stop,” “feeling bad when they cannot do it,” and “trying to stop but cannot.”
Items of the “compulsive” subscale reflected themes of impaired control and dependence. Some of the items on both the “appetitive” and “compulsive” subscales overlap with some of the DSM-5 criteria for a substance use disorder (APA, 2013).

Adults in the Chassin et al. (2007) sample rated the Compulsive dimension as more important than the Appetitive dimension in defining tobacco addiction whereas adolescents rated both dimensions as equally important in defining tobacco addiction. Also, Chassin et al. (2007) found that adolescents who rated the Appetitive dimension as highly indicative of tobacco addiction were more likely to rate cigarette smoking as very addicting. However, adults in their sample were more likely to rate cigarette smoking as very addicting if they emphasized both Compulsive and Appetitive dimensions. These results imply that adolescents differ at least somewhat from adults in their definition of tobacco addiction.

In another study of this topic, Furnham and Lowick (1984) investigated lay theories of the causes of alcoholism among British adults. They found that participants were most likely to emphasize psychological causes, such as anxiety, depression, stress at work, feelings of inferiority, and boredom. However, participants in their study rated biological and genetic causes of alcoholism as least important (Furnham & Lowick, 1984). Finally, most participants rejected moralistic explanations of alcoholism.

Furnham and Thomson (1996) conducted a more sophisticated investigation of lay perceptions of heroin addiction. In their study, the researchers administered a questionnaire about the causes, correlates, and cures of heroin addiction to a convenience sample of British adults. Participants rated heroin addicts as aggressive and obnoxious, and as involved in theft and prostitution, but not as amoral (Furnham & Thomson, 1996). In terms of etiology, participants endorsed psychological (e.g., frustration, despair) causes of heroin addiction more strongly than
biological or genetic causes of heroin addiction. With regard to treatment, participants rated therapy and counseling, family support, self-motivation, and will power as most effective. Finally, Furnham and Thomson (1996) found that participants recommended different treatments depending on presumed causes. Combined with the results of Chassin et al. (2007) and Furnham and Lowick (1984), these results indicate that laypeople can actively define substance addiction along the dimensions of etiology, defining characteristics, and treatment options, though they emphasize different aspects of these dimensions than researchers.

Most of the research on lay perception of addiction has focused on addiction to alcohol and drugs, rather than addiction to behavioral activities. Thege et al. (2015) published one of the few studies that compared lay theories of behavioral versus substance addictions. Utilizing a nationwide sample of Canadians, Thege et al. (2015) assessed participants’ beliefs about the etiology, addiction liability, and prevalence of either a specific substance (i.e., alcohol, tobacco, marijuana, or cocaine) or specific behavior (i.e., problematic gambling, eating, shopping, sexual behavior, video gaming, or work). Their participants considered substances to be more addictive than behaviors and rated moral failures as more relevant to the etiology of behavioral addictions versus substance addictions. Thege et al.’s (2015) findings demonstrate that the lay public differentiates among types of addiction, and that individuals with behavioral addictions may experience greater stigmatization due to the public’s belief that their problems are due to personal faults they should be able to control.

My review of the literature did not reveal any previous studies evaluating lay views of the subjective definitions of behavioral addictions, or comparing lay definitions of behavioral addictions to lay definitions of substance addictions. Also, no previous studies evaluated lay views of the effectiveness of psychosocial treatments for those with a gambling addiction or
pornography addiction. Furthermore, no prior studies compared lay individuals’ willingness to affiliate with people described as having these two behavioral addictions. Therefore, I designed the present study to assess perceived elements of addiction, perceived etiology, and willingness to affiliate with a person described as having either one of two behavioral addictions (i.e., pornography addiction or pathological gambling) or one of three substance addictions (i.e., alcohol, marijuana, or heroin).

Hypotheses

Ha(1): Participants would not report equal scores on the Social Distance Scale-Substance Users for individuals experiencing different types of addiction. To test this hypothesis, I calculated a one-way Analysis of Variance (ANOVA), followed by post-hoc comparisons. Bonferroni correction was made to control for inflation of familywise error rate through multiple comparisons.

Ha (2): Within each condition, there would be significant negative correlations between Social Distance Scale-Substance Users scores and Level of Contact scores within each target addiction. To test this hypothesis, I calculated five Pearson product-moment correlations, one for each type of addiction.

Ha(3): Participants’ definitions of addiction, as measured by the Subjective Definitions of Addiction Scale, would vary depending upon the addiction they were asked to define. To test this hypothesis, I calculated a one-way ANOVA for each of the two subscales (Compulsive; Appetitive), followed by post-hoc comparisons. Bonferroni correction was made to control for inflation of familywise error rate through multiple comparisons.

Ha (4): Because popular culture portrays addiction as comprising tolerance, withdrawal, and loss of control, I hypothesized that participants would rate Compulsive elements as
significantly more indicative of an addiction than Appetitive elements for each of the five target addictions. I conducted five paired samples t-tests to test this hypothesis. Bonferroni correction was made to control for inflation of familywise error rate through multiple comparisons.
METHOD

Participants

Participants were recruited using the Amazon Mechanical Turk online subject pool. To be eligible, participants had to report being current residents of the United States between the ages of 18 and 65. Participants were compensated $1.00 for their participation, which was deposited into their Amazon account.

Power Analysis

To calculate the number of participants, I conducted a power analysis assuming a moderate effect size of $f=0.30$, based on prior research comparing stigmatization of cocaine dependence to that of alcohol dependence (Link et al., 1999). Based on a corrected alpha level of 0.01, a power of 0.80, and 5 groups (i.e., gambling addiction, pornography addiction, heroin addiction, marijuana addiction, alcohol addiction), the analysis yielded a total sample size of 195 participants to obtain a significant main effect for social distance on the one-way ANOVA. This calculation was conducted using G*Power 3.1.

Procedure

Potential participants were provided with a short description of the study and a link to an external Qualtrics address that administered the study materials. After giving informed consent and confirming eligibility, eligible participants were randomized to one of five different conditions. The questionnaires that participants completed in each of the separate conditions were identical except for the type of additive behavior about which they answered the dependent measures. Specifically, the conditions reflected one of three substance addictions (i.e., alcohol, marijuana, or heroin) or one of two behavioral addictions (i.e., pornography addiction or pathological gambling).
Data Grooming

To minimize the potential effects of missing data on subsequent analyses, I removed those 10 participants who completed less than 90 percent of the questionnaire items. Next, I excluded those 19 participants who either skipped the age question (which was necessary for eligibility determination) or failed either of two checks of attention. In addition, I excluded 13 participants who took significantly longer than average (>2.5 SDs) to complete the survey. Finally, I excluded nine participants who endorsed mutually exclusive levels of contact with an addicted target (e.g., “I have never observed a person that I was aware had a gambling addiction” and “I have observed persons with a gambling addiction on a frequent basis”). Figure 1 summarizes the steps I took to eliminate participants to yield the final sample of $n=612$.

Measures

Social Desirability Scale (SDS). To measure participants’ tendency to present themselves in a socially desirable manner, I administered the Social Desirability Scale-17 (Stober, 2001). The SDS-17 contains 17 statements that respondents answer as True or False. Stober (2001) reported that the item asking about use of illegal drugs on the 17-item version demonstrated poor item-total correlations and should not be included in the final scale. Thus, I used a 16-item version of this measure. Several evaluations of the SDS-16 have found acceptable internal consistency with Cronbach’s alphas ranging from 0.70 to 0.80 in samples of university students, users of pornography, and recreational gamblers (Stober, 2001; Kraus & Rosenberg, 2014; Ashrafioun et al., 2012). In addition, correlations of the SDS-16 with the Marlowe-Crowne Social Desirability Scale ($r=0.68$ to $r=0.78$), Eysenck Personality Questionnaire Lie Scale ($r=0.60$), and Impression Management subscale of the Balanced Inventory of Desirable Responding ($r=0.37$ to $r=0.50$) support convergent validity (Stober, 2001; Blake et al., 2006).
Also, discriminant validity of the SDS-16 has been supported by relatively weak correlations ($r=0.19$ to $r=0.21$) with the Self-Deceptive Enhancement subscale of the Balanced Inventory of Desirable Responding (Stober, 2001; Blake et al., 2006). Furthermore, the SDS-16 has demonstrated good test-retest reliability ($r=0.82$) across 4-weeks (Stober, 2001). Finally, the SDS-16 has been used in both paper/pencil and online formats (Blake et al., 2006). Cronbach’s alphas for the SDS-16 in the present study ranged from $\alpha=.78$ to $\alpha=.84$. See Appendix A for the full measure.

**Social Distance Scale-Substance Users.** To assess participants’ willingness to interact with an individual with a behavioral or substance addiction, I administered a modified version of the Social Distance Scale for Substance Users (Brown, 2011). This 7-item measure asks participants to rate how willing they would be to interact with an individual with a substance use problem (e.g., “rent a room in one’s home”; “work on the same job”; “have person as a neighbor”) using a scale ranging from 1 (*Definitely willing*) to 4 (*Definitely unwilling*). Brown (2011) found the measure had adequate internal consistency reliability (Cronbach’s alpha = 0.80). In support of convergent validity, individuals who felt more comfortable spending time with a person with a substance use problem versus a person with a mental illness had significantly lower Social Distance Scale-Substance Users scores than Social Distance Scale-Mental Illness scores (Brown, 2011). In support of discriminant validity, Brown found the Social Distance Scale-Substance Users was correlated only weakly ($r=0.22$) with a general mental illness Social Distance Scale. See Appendix B for the full measure.

To evaluate the internal consistency reliability of the social distance measure, I calculated Cronbach’s alpha and item-total correlations for each of the five conditions. Cronbach’s alphas for the seven-item social distance scale were acceptable to excellent depending on the condition:
gambling ($\alpha=0.78$), pornography ($\alpha=0.88$), alcohol ($\alpha=0.85$), marijuana ($\alpha=0.92$), and heroin ($\alpha=0.83$) conditions. Furthermore, within each of the five conditions, the majority of items had an item-total correlation above $r=0.5$. Taken together, these results indicate that the social distance scale demonstrated acceptable internal consistency reliability in each of the five conditions.

**Level of Contact Report.** To assess participants’ previous contact and familiarity with people with behavioral or substance addictions, I administered a modified version of the Level of Contact Report (Holmes, Corrigan, Williams, Canar, & Kubiak, 1999). The Level of Contact Report is a 12-item checklist that lists varying levels of contact one might have had with an individual with mental illness, ranging from least intimate (i.e., “I have never observed a person that I was aware had a severe mental illness”) to most intimate (i.e., “I have a severe mental illness”). Participants are asked to check all levels of contact they have experienced and are given a score based on the most intimate level of contact they endorse. Holmes et al. (1999) reported high inter-rater reliability of the rank ordering of items ($\rho=0.83$) by experts in severe mental illness. Discriminant validity of this scale has been supported by its low, non-significant correlation ($r=0.17$) with a general test of knowledge about mental illness (Holmes et al., 1999). See Appendix C for the full measure.

**Subjective Definitions of Addiction Scale.** To assess participants’ subjective definitions of addiction, I administered the 13-item scale created by Chassin, Presson, Rose, & Sherman (2007). Participants are asked to rate the extent to which each of the 13 listed behaviors, affects, cognitions, and physiological reactions are indicative of an underlying addiction using a scale from 1 (*Not at all*) to 5 (*Very much*). Exploratory and confirmatory factor analyses by Chassin et al. (2007) revealed that the scale comprises two factors: 1) Appetitive dimensions of addiction
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(e.g., “Getting high,” “Liking the behavior a lot”) and 2) Compulsive dimensions of addiction (e.g., “Not being able to control the behavior”). The content validity of this scale is supported by its overlap with the 11 criteria for a Substance Use Disorder in DSM-5 (American Psychiatric Association, 2013). For example, the items reflect impaired control, tolerance, withdrawal, craving, and psychosocial consequences, all of which are symptoms of a substance use disorder according to DSM-5 (American Psychiatric Association, 2013).

To evaluate the internal consistency of the Compulsive and Appetitive subscales that Chassin et al. (2007) created, I calculated Cronbach’s alpha, inter-item correlations, and item-total correlations for each subscale for each of the five conditions. Cronbach’s alphas for the Compulsive subscale were good or very good for each condition: gambling ($\alpha = 0.81$), pornography ($\alpha = 0.89$), alcohol ($\alpha = 0.85$), marijuana ($\alpha = 0.82$), and heroin ($\alpha = 0.83$). In addition, within each of the five conditions, the majority of items of the Compulsive subscale had an item-total correlation above $r = 0.5$. Taken together, these results indicate that the Compulsive subscale for each condition demonstrated acceptable internal consistencies in the present sample. Finally, I noted that items of the Compulsive subscale reflected themes of compulsion and dependence.

However, Cronbach’s alphas for the original Appetitive subscale ranged from poor to good across conditions: gambling ($\alpha = 0.72$), pornography ($\alpha = 0.76$), alcohol ($\alpha = 0.68$), marijuana ($\alpha = 0.85$), and heroin ($\alpha = 0.87$). My examination of the inter-item and item-total correlations revealed one item – “Getting high” – for which the coefficients were below $r = 0.3$ for participants rating gambling, pornography, and alcohol addictions. Given the small inter-item and item-total correlations, I decided to eliminate the “Getting high” item from the subscale. After elimination of that item, Cronbach’s alphas across conditions were acceptable to excellent: gambling ($\alpha = 0.76$), pornography ($\alpha = 0.88$), alcohol ($\alpha = 0.71$), marijuana ($\alpha = 0.86$), and heroin ($\alpha = 0.87$).
Furthermore, item-total correlations for each item were generally above $r = 0.5$, thus suggesting adequate internal consistency of the revised Appetitive subscale. Therefore, for all further analyses, I calculated the Appetitive subscale without that one item. Finally, I noted that items of the Appetitive subscale reflected themes of appetitive drive and ignoring consequences of the behavior in question.

**Demographics Questionnaire.** I designed this questionnaire to assess basic demographic information including gender, age, educational and employment status, etc. See Appendix E for the full measure.

**Perceptions of Addiction Potential.** I designed this one-item measure to assess participants’ perceptions of the potential for most people to become addicted to a specified behavior or substance. The question used a 5-point scale from 1 (*Not at all addictive*) to 5 (*Extremely addictive*). See Appendix G for this measure.

**Subjective Etiology Questionnaire.** To assess participants’ beliefs about the cause(s) of behavioral or substance addictions, I administered the 6-item etiology questionnaire developed by Thege et al. (2015), and included an additional item -- “social pressure from others.” The questionnaire asks participants to rate the likelihood of potential causes of addiction (e.g., “character problem,” “chemical imbalance,” “way person was raised”) using a 5-point scale from 1 (*Very unlikely*) to 5 (*Very likely*). Content validity of the 6-item version of this questionnaire is supported by the use of the same potential causes in previous studies of mental illness stigma such as the General Social Survey (Link, Phelan, Bresnahan, Stueve, & Pescosolido, 1999; Pescosolido et al., 2010). See Appendix F for the full measure.

To evaluate the internal consistency reliability of the seven-item Subjective Etiology Questionnaire, I calculated Cronbach’s alpha and item-total correlations for each of the five
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conditions. Cronbach’s alphas for the seven-item scale ranged from unacceptably low to acceptable across conditions: gambling (α =0.57), pornography (α=0.64), alcohol (α=0.66), marijuana (α=0.72), and heroin (α=0.67). Examination of item-total correlations revealed that across conditions, different items were weakly associated (r <0.2) with total scores. Therefore, I concluded that the seven items did not comprise a single scale, and I analyzed each specific etiology as separate dependent measures.

**Perceptions of Treatment Effectiveness Questionnaire.** I designed this questionnaire to assess participants’ beliefs about the likelihood of natural recovery and the effectiveness of various treatments for the substance or behavioral addiction. See Appendix G for the full measure. To evaluate the internal consistency reliability of the seven-item Perceptions of Treatment Effectiveness Questionnaire that I created, I calculated Cronbach’s alpha and item-total correlations across items for each of the five conditions. Cronbach’s alphas for the seven-item scale were unacceptably low in every condition: gambling (α =0.63), pornography (α=0.62), alcohol (α=0.63), marijuana (α=0.66), and heroin (α=0.60). Examination of item-total correlations revealed that the items “Use will power” and “Take medication” were weakly associated (r <0.2 across condition) with total scores. Therefore, I decided to remove those items and calculated the Cronbach’s alpha and item-total correlations for the resultant five-item scale. Cronbach’s alphas for the five-item scale were acceptable across conditions: gambling (α =0.76), pornography (α=0.76), alcohol (α=0.75), marijuana (α=0.80), and heroin (α=0.74).

Furthermore, within each of the five conditions, the majority of items had an item-total correlation above r =0.5. Taken together, these results indicate that the revised five-item Perceptions of Treatment Effectiveness Questionnaire (reflecting individual counseling, group
counseling, social support, and psychoeducation) demonstrated acceptable internal consistency reliability for each of the five conditions.
RESULTS

Randomization Check

To check whether randomization resulted in similar subsamples across the five conditions (i.e., gambling, pornography, alcohol, marijuana, and heroin addiction), I evaluated whether selected demographic characteristics varied across conditions. Results of two separate one-way analyses of variance (ANOVA) did not reveal statistically significant differences among the five conditions on age, $F(4,607)=1.81, p=0.126$, or on political orientation, $F(4,607)=1.880, p=0.112$. Chi-square analyses did not reveal significant associations between condition and gender, geographic location, marital status, ethnicity, highest level of education, current employment status, or having taken a course on Abnormal Psychology. However, there was a statistically significant yet small association between condition and current living status, $\chi^2(8)=19.4, p=.01, \phi=.18$. Overall, randomization yielded subsamples with similar demographics across the five conditions. See Table 1 for demographics for each separate condition.

Representativeness of the sample

I compared the entire sample with the greater U.S. population on several demographic variables using recent national data (U.S. Bureau of Labor Statistics, 2011; U.S. Census Bureau 2011a, 2011b, 2011c, 2012a, 2012b, 2012c). As examination of Table 2 demonstrates, results of chi-square goodness-of-fit tests indicated that the study sample contained younger (those under age 44), white, employed, never married, college educated participants who lived alone. Because I obtained my sample using an online recruitment and data collection procedure, it is not surprising that it comprised younger individuals with a higher SES because they are more likely to own computers.
Redundancy of Dependent Measures

First, I calculated the correlations among the five main outcome measures (i.e., Social Distance Scale-Substance Users, Compulsive and Appetitive subscales of the Subjective Definitions of Addiction Scale, Perceptions of Treatment Effectiveness Questionnaire, and Addictive Potential) within each of the five conditions to assess whether the dependent measures were redundant (see Tables 6 to 10). Although there were significant and meaningful associations between the Compulsive and Appetitive subscales for participants rating gambling and heroin addictions, the correlations between these two subscales were notably smaller in the other three conditions (alcohol, marijuana, pornography). As examination of the Tables also reveals, although 25 of the remaining 45 coefficients were significant, the magnitude of these correlations was generally small to medium. Given these findings, and because I think the five dependent measures reflect sufficiently distinct attitudes, I conducted separate ANOVAs for each dependent measure. To control for inflation of familywise error due to conducting one-way ANOVAs for the five main outcome measures, I used a Bonferroni correction, α = .05/5 = .01.

Differences in Social Distance by Condition

Next, I evaluated whether willingness to affiliate (Social Distance Scale) differed as a function of the specified behavioral or substance addiction. The one-way ANOVA revealed a significant effect of condition on social distance total scores, $F(4,607)=31.39, p<.001, \eta^2=.01$, but the effect size was small. This result supported my hypothesis that willingness to affiliate would differ by type of addiction. Post-hoc tests with Bonferroni correction revealed that participants were significantly less willing to affiliate with individuals with heroin addiction than with the other four types of addictions. In addition, participants were significantly less willing to affiliate with individuals with alcohol addiction than those with pornography or marijuana.
addiction. Nevertheless, mean differences among conditions were small and, across all five conditions, participants were generally unwilling to affiliate with individuals with any type of addiction (See Table 3). Given these results, I decided it was not appropriate to combine the three substance addictions as a group for comparison with the two behavioral addictions as a group.

Secondly, I wanted to evaluate whether previous contact with people with the addiction in question would be associated with greater willingness to affiliate. To test this question, I calculated one-tailed Pearson correlations between willingness to affiliate and level of contact within each condition. None of the five conditions yielded significant correlations at the $p<.05$ level and all five correlations were small in magnitude. This analysis provides evidence contrary to my original hypothesis that previous level of contact would be associated with greater willingness to affiliate.

**Differences in Subjective Definitions across conditions**

Next, I evaluated whether participants’ subjective definitions of addiction varied depending on the addiction in question. The one-way ANOVA for the Compulsive subscale revealed a significant effect of addiction type on subscale scores, $F(4,607)=13.483$, $p<.001$, $\eta^2=.08$, but the effect size was small. Post-hoc tests with Bonferroni correction revealed that participants were significantly more likely to consider Compulsive elements to be indicators of addiction to heroin, alcohol, or gambling than of addiction to pornography or marijuana. Examination of the means revealed that participants in all five of the conditions generally rated items on the Compulsive subscale as *Pretty Much* indicative of an underlying addiction (See Table 3).
Similarly, the one-way ANOVA for the revised Appetitive subscale revealed a significant effect of addiction type on subscale scores, $F(4,607)=23.572, p<0.001$, $\eta^2=.13$, and the effect size was small-to-medium. Post-hoc tests with Bonferroni correction revealed that participants were significantly more likely to rate Appetitive elements of addiction to be indicators of addiction to heroin, gambling, or alcohol than of addiction to pornography or marijuana. Examination of the means revealed that participants rated items on the Appetitive subscale between *A little* and *Somewhat* indicative of marijuana addiction, whereas participants rated items on the Appetitive subscale between *Somewhat* and *Pretty Much* indicative of the other four addictions (See Table 3). Given these results, I decided it was inappropriate to combine the three substance addictions as a group for comparison against the two behavioral addictions as a group on the Subjective Definitions of Addiction Scale.

As a follow-up analysis, I tested whether participants rated Compulsive aspects of addiction as more indicative of an addiction than Appetitive aspects by conducting paired-samples $t$-tests between the two subscales within each of the five conditions. As examination of Table 5 indicates, participants rated Compulsive elements as significantly more indicative of an underlying addiction than Appetitive elements for each of five addictions. These results supported my original hypothesis that Compulsive elements would be considered more indicative of all five addictive behaviors.

**Differences in Perceptions of Treatment Effectiveness across conditions**

Next, I evaluated whether participants’ ratings of the effectiveness of seven different therapies varied depending upon the type of behavioral or substance addiction. The one-way ANOVA revealed a significant effect of addiction type on treatment efficacy scores, $F(4,607)=4.816, p=.001$, $\eta^2=.03$, but the effect size was small. Post-hoc tests with Bonferroni
correction revealed that participants rated treatment for gambling and alcohol addiction to be significantly more beneficial than treatment for pornography addiction. Nevertheless, examination of the means revealed that participants generally rated treatment as *Somewhat Beneficial* for all five types of addictions (See Table 3).

Because I removed the items “Will power” and “Take medication” from the original scale, as a supplementary follow up analysis, I conducted one-way ANOVAs for each of these two items. Results of the one-way ANOVA for the item “Will power” indicated a significant effect of addiction type on participants’ perception of efficacy, $F(4, 607)=5.92, p<.001, \eta^2=.04$, but the effect size was small. Post-hoc tests with Bonferroni correction revealed that participants rated Will power as significantly more effective for pornography addiction than for gambling or heroin addiction. In addition, post-hoc tests revealed that participants rated will power as significantly more effective for marijuana addiction than for heroin addiction. Examination of the means revealed that participants generally rated the efficacy of Will power somewhere between *No effect* and *Somewhat Beneficial* across conditions.

Results of the one-way ANOVA for the item “Take medication” indicated a significant effect of addiction type on participants’ efficacy ratings, $F(4, 605)=21.38, p<.001, \eta^2=.03$, but the effect size was small. Post-hoc tests with Bonferroni correction revealed that participants rated medication as significantly more effective for heroin addiction than the other four types of addiction. Also, participants rated medication as significantly more effective for alcohol addiction than for pornography addiction. With the exception of heroin addiction, participants generally rated the efficacy of medication for gambling, pornography, alcohol, and marijuana addiction somewhere between *No effect* and *Somewhat beneficial*. 
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Differences in Perceptions of Addiction Potential across conditions

Next, I evaluated whether participants’ ratings of addiction potential varied as a function of the type of behavior or substance. Results of a one-way ANOVA revealed a significant effect of condition on perceptions of addiction potential, $F(4,607)=116.62$, $p<.001$, $\eta^2=.43$, and the effect size was large in magnitude. Post-hoc tests with Bonferroni correction revealed that participants rated heroin ($M=4.5$, $SD=0.64$) as significantly more addictive than the other four types of addiction. Next, post-hoc tests revealed that participants rated alcohol ($M=2.8$, $SD=1.0$) as significantly more addictive than pornography ($M=2.4$, $SD=1.0$) and marijuana ($M=2.2$, $SD=1.1$), but not significantly more or less addictive than gambling ($M=2.6$, $SD=1.0$). Also, post-hoc tests revealed that participants rated gambling as significantly more addictive than marijuana. Finally, post-hoc tests revealed no significant difference in participants’ ratings of the addictiveness of pornography versus marijuana. As a result of these findings, I decided it was inappropriate to combine the behavioral addictions as a group for comparison with the substance addictions as a group on this measure.

Differences in Subjective Etiology Questionnaire across conditions

Finally, I evaluated whether participants’ ratings of each of the seven potential causes of addiction varied as a function of the addiction in question. Because internal consistency reliability analyses did not support combining these seven as one scale, and some of the etiologies are notably different, I conducted seven one-way ANOVAs. To control for inflation of familywise error due to conducting ANOVAs for the seven potential causes, I used a Bonferroni correction, $\alpha=.05/7=.007$. See Figures 2-6 for specific percentages of participants in each condition who endorsed each of these explanations as a possible cause of addiction. See Table 4 for mean ratings for each cause for each of the five types of addiction.
Character problem or flaw. Results of the one-way ANOVA for this etiology revealed a non-significant effect of addiction type, $F(4,607)=1.473, p=.209$. In addition, inspection of means across conditions revealed that participants generally did not rate a character problem or flaw as a likely cause of addiction.

Chemical imbalance in the brain. Results of the one-way ANOVA yielded a significant effect of condition, $F(4,607)=3.862, p=.004, \eta^2=.02$, but the effect size was small. Post-hoc comparisons with Bonferroni correction revealed that participants rated a chemical imbalance in the brain as a significantly more likely cause of gambling addiction than of marijuana addiction. Across conditions, participants generally rated a chemical imbalance in the brain as a Somewhat Likely cause of addiction.

Genetic. Results of the one-way ANOVA yielded a statistically significant effect of condition, $F(4,607)=15.86, p<.001, \eta^2=.09$, but the effect size was small. Post-hoc tests with Bonferroni correction revealed that participants rated genetics as significantly more likely to be a cause of alcohol addiction than a cause of the other four types of addiction. Furthermore, post-hoc tests revealed that participants rated genetics as a significantly more likely cause of heroin addiction than pornography addiction or marijuana addiction.

Way a person was raised. Results of the one-way ANOVA revealed a significant effect of condition, $F(4,604)=6.67, p<.001, \eta^2=.04$, but the effect size was small. Post-hoc tests with Bonferroni correction revealed that participants rated the way a person was raised as significantly more likely to be a cause of alcohol and heroin addiction than marijuana addiction. Nevertheless, participants generally rated the way a person was raised as a Somewhat Likely cause of all addictions except marijuana.
Traumatic events in early childhood. Results of the one-way ANOVA revealed a significant effect of addiction type, $F(4,606)=11.87, p<.001, \eta^2=.07$, but the effect size was small. Post-hoc tests with Bonferroni correction revealed that participants rated early traumatic events as significantly more likely to be a cause of alcohol and heroin addiction than a cause of marijuana or gambling addiction. In addition, post-hoc tests revealed that participants rated early trauma as a significantly more likely cause of pornography addiction than marijuana addiction. Participants rated early traumatic events as a Somewhat Likely cause of alcohol, pornography, and heroin addiction.

Stressful circumstances in one’s life. The one-way ANOVA revealed a significant effect of addiction type, $F(4, 605)= 4.75, p=.001, \eta^2=.03$, but the effect size was small. Post-hoc tests with Bonferroni correction revealed that participants rated stressful life circumstances as significantly more likely to be a cause of gambling and alcohol addiction than of pornography addiction, but the means were notably similar among conditions. Specifically, participants rated “stressful life circumstances” as a Somewhat Likely cause of each of the five types of addiction. Furthermore, compared to the other six causes, a higher percentage of participants rated “stressful life circumstances” as a likely cause of each addiction.

Social pressure from others. Results of the one-way ANOVA revealed a significant effect of addiction type, $F(4, 602)=12.84, p<.001, \eta^2=.08$, but the effect size was small. Post-hoc tests with Bonferroni correction indicated that participants rated social pressure from others as a significantly more likely cause of heroin addiction than the other four addictions. In addition, post-hoc tests revealed that participants rated social pressure from others as more likely to be a cause of alcohol and marijuana addiction than of pornography addiction. For all conditions
except pornography, participants rated social pressure from others to be a *Somewhat Likely* cause of addiction.

**Associations Between Socially Desirable Responding and Dependent Measures**

Because the tendency to present oneself in a socially desirable manner may influence how honestly one reports one’s attitudes about others with mental illness, I conducted Pearson product-moment correlations between scores on the Social Desirability Scale and each of the key dependent measures within each condition. Overall, there were 13 significant associations out of 60 total bivariate correlations between outcome variables and tendency to present oneself in a socially desirable manner. Any associations that were significant were relatively small in magnitude (*r*< .30). Therefore, it appears that participants’ beliefs and perceptions about these various addictions were not strongly associated with the tendency to present themselves in a socially desirable manner.

**Associations between Outcome Measures and having taken Abnormal Psychology course**

I also wanted to evaluate whether participants who had taken a course in Abnormal Psychology, compared to those who had not taken such a course, might have different beliefs and perceptions about individuals with an addiction. Thus, I compared scores on the outcome measures for individuals who had versus had not taken such a course, within each of the five conditions. Across conditions, four out of 60 of the *t*-tests were significant for the outcomes assessed in the study. Given these results, it appears that completion of a college-level course in Abnormal Psychology was generally unrelated to participants’ attitudes and perceptions about these various addictions.
DISCUSSION

Contrary to the idea that people view those with different types of substance addiction as similar to each other and as different from those with behavioral addictions, participants’ attitudes regarding alcohol, heroin, and gambling addiction differed significantly from those for marijuana and pornography addiction. This pattern of results is consistent with another finding, specifically that participants rated marijuana and pornography as having lower “addiction potential” than alcohol, heroin, and gambling.

Nevertheless, for most of the outcome measures, there were few meaningful differences in mean ratings of the willingness to affiliate, value of treatment and etiological explanation of these five types of addiction. In addition, potential explanatory variables such as “addiction potential,” and “natural recovery potential” were not meaningfully associated with the outcome measures. Interestingly, these findings are consistent with some professionals’ opinion that all addictions share common core features, are caused by similar factors, and respond to similar treatments (Grant et al., 2010; Karim & Chaudhri, 2012).

Similar to previous studies of stigmatization of those with mental illness (Pescosolido et al., 2010; Link et al., 1999, Schomerus et al., 2010), participants in the present study were generally unwilling to affiliate with an individual with an addiction. Due to the pervasiveness and negative consequences of stigmatization for those with mental illness, clinicians and researchers would like to understand both the causes and means of preventing or reducing stigmatization. One particular focus has been whether familiarity with people with mental illness influences attitudes such as willingness to affiliate.

Some past studies with members of the lay public have found that previous interaction with an individual with a mental illness was associated with greater willingness to affiliate with
such an individual (Corrigan et al., 2003). However, results of other studies suggest that the relationship between familiarity with mental illness and stigmatization is mediated by negative attitudes about those with such an illness, such as the belief that those with a mental illness cannot care for themselves (Corrigan, P., Backs-Edwards, A., Green, A., Diwan, S., & Penn, D., 2001). In the present study, past interaction with someone with the addiction in question was generally unrelated to participants’ willingness to affiliate with an individual with that addiction. The lack of association between these variables in the present study could be due, in part, to attitudes formed from previous interactions with an individual with a mental illness. For example, if someone had frequent negative interactions with a close family member with mental illness, they may have generated negative stereotypes about all individuals with mental illness, and thus desire distance from such individuals. Conversely, frequent positive interactions with a close family member with mental illness could help one to reject negative stereotypes and seek out more frequent contact with such individuals. Thus, it is possible that efforts to reduce stigmatization should not target familiarity per se, but rather positive familiarity with individuals with mental illness.

With regards to their conceptualization of addiction, participants in the present study offered a balanced understanding of the definitions of the five addictions they were asked to rate. In particular, participants defined the addictions as having both Compulsive and Appetitive qualities, although they generally rated signs of Compulsion as more indicative of addiction than Appetitive signs. This latter finding is consistent with the professional opinion that loss of control, tolerance, and withdrawal are key features of all addictions (American Psychiatric Association, 2013).
Furthermore, participants rated multiple potential factors as likely causes of each type of addiction. Congruent with some past studies (Pescosolido et al., 2010; Thege et al., 2015; Meurk et al., 2014) participants rated both substance and behavioral addictions as having biological, psychological, and social causes. However, unlike other previous studies (Pescosolido et al., 2010; Thege et al., 2015), participants did not consider character problems to be a likely cause of behavioral or substance addictions. The majority of participants in the present study rated stressful life circumstances as a likely cause of all five types of addiction. This emphasis on multiple causes of addiction suggests that the public possesses some level of awareness of the complex interplay of factors that lead to addiction. Finally, in comparison to Pescosolido et al.’s (2010) study, the low endorsement of character flaw as a cause of addiction in both my study and Thege et al. (2015), suggests that the lay public are less inclined to moralistic judgments of addiction than they apparently were in the recent past.

I also found that participants in the present study were optimistic about the effectiveness of psychosocial interventions such as support groups, individual counseling, social support, psychoeducation, and group therapy. However, unlike previous research (Pescosolido et al., 2010; Furnham & Thompson, 1996), participants in the current study did not rate medications as effective treatment strategies for any of these five types of addiction. This latter finding is intriguing given the recent rise in pharmacotherapy for both detoxification and relapse prevention in substance addictions, and suggests that many lay individuals remain unaware of the advances in pharmacotherapy in the treatment of various substance addictions.

There are several limitations of the present study that may affect the validity of the results. First, similar to all studies that ask people about their attitudes, it is unclear to what extent self-reported attitudes correspond to actual behavior. This limitation is particularly
important for stigmatization, given that individuals with an addiction may experience acts of discrimination such as denial of housing and employment. Such behaviors not only affect those individuals who are directly targeted, but also other individuals with addiction who may avoid being labeled as an “addict,” for fear of discrimination. However, contrary to the assumption that attitudes are poor indicators of behavior, results of a meta-analysis by Kraus (1995) suggest that self-reported attitudes are correlated at least moderately with future behaviors.

Another limitation of the present study is that all attitudes were measured using self-report questionnaires. One disadvantage of using self-report measures is that individuals may present themselves in a socially desirable manner, which may not reflect their real beliefs. However, the present study found few meaningful associations between scores on a measure of social desirability and the main outcome measures. Nevertheless, individuals may hold contradictory explicit and implicit attitudes, and implicit attitudes may affect an individual’s behavior toward those with an addiction, even without their awareness of their underlying attitudes. For these reasons, a combined assessment of both explicit and implicit attitudes could provide a more thorough understanding of lay individuals’ attitudes toward those with a behavioral or substance addiction.

A third limitation of the present study was that many of my measures had not been validated in more than a few studies. Nevertheless, the measures had high internal consistency reliability and content validity, and my use of the same measures employed in previously published large-n research studies (e.g., Pescosolido et al., 2010; Thege et al., 2015) facilitated comparisons with previous results. Future refinement of the construct and criterion validity of these attitudinal measures would be of great benefit to researchers studying stigmatization.
Another limitation of the present study concerns the use of an online subject pool and confidential self-report measures. Given that previous researchers conducted in-person interviews (Pescosolido et al., 2010; Crisp et al., 2000), the results of the present study may not be directly comparable to such studies. However, the use of confidential self-report measures should decrease the potential bias of socially desirable responding. Future researchers studying lay attitudes of addiction should compare results of confidential surveys to in-person interviews to evaluate the strengths and weaknesses of each approach.

A related limitation of the present study involves the representativeness of the sample. Previous research on public stigma of various mental illnesses used nationally representative samples obtained via stratified random sampling within the United States and the United Kingdom (Pescosolido et al., 2010; Crisp et al., 2000). However, the present sample was obtained from an online subject pool. In comparison to both the population of the United States, and the nationally representative General Social Survey sample employed by Pescosolido et al. (2010), the present sample included larger proportions of white, younger and higher SES individuals. In comparison to older individuals, younger individuals in the U.S. tend to identify less with conservative ideology (Pew, 2014). This was true of the present study, as participants generally self-identified as somewhere between moderate and liberal on the one-item measure of political ideology. Given that previous research has found an association between conservative ideology and increased stigmatization (Furnham & Thomson, 1996), I would expect the present results to be an underestimate of stigmatization in the larger population. Also, unlike older Americans, younger Americans have presumably grown up in a culture with increased tolerance of diversity, which represents a cohort influence that could lead to less stigmatization of those with an addiction.
However, even though my sample was not representative of the American population on several demographic characteristics, some researchers have argued that demographic variables are poor predictors of stigmatization (Pescosolido, 2013). For example, Crisp et al. (2000) found that male and female participants endorsed similar levels of stigmatization toward those with mental illnesses. Also, Crisp et al. (2000) found that 16 to 24 year-old participants had similar attitudes as 25 to 64 year-old participants. Similarly, Pescosolido et al. (2010) found that controlling for participant age, sex, education, and race did not significantly affect their results.

Future research is needed to better understand the attitudes of the lay public toward individuals with behavioral or substance addictions. Such research could further assess explicit attitudes about behavioral and substance addictions by utilizing open-ended questions. The use of open-ended questions would allow for an assessment of lay individuals’ ability to self-generate a coherent, nuanced view of these addictions. In addition, future studies could employ longitudinal designs to allow for measurement of the stability of intra and inter-individual attitudes over time. These latter studies would allow for an analysis of cohort effects that may influence the public’s understanding and treatment of those with an addiction.
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Table 1

Demographic Characteristics of Participants in Each Condition

<table>
<thead>
<tr>
<th>Variables</th>
<th>Gambling (n = 127)</th>
<th>Pornography (n = 112)</th>
<th>Alcohol (n = 118)</th>
<th>Marijuana (n = 123)</th>
<th>Heroin (n = 132)</th>
<th>Chi-square/ F-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD) or</td>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Percentage of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sample (^{a,b})</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (Years)</td>
<td>36.4(11.9)</td>
<td>33.5(10.7)</td>
<td>34.4(10.8)</td>
<td>32.8(10.7)</td>
<td>34.3(11.6)</td>
<td>1.8</td>
</tr>
<tr>
<td>18-44</td>
<td>74%</td>
<td>84%</td>
<td>84%</td>
<td>85%</td>
<td>83%</td>
<td></td>
</tr>
<tr>
<td>45 and Older</td>
<td>26</td>
<td>16</td>
<td>16</td>
<td>15</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.0</td>
</tr>
<tr>
<td>Male</td>
<td>50%</td>
<td>51%</td>
<td>56%</td>
<td>47%</td>
<td>49%</td>
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</tr>
<tr>
<td>Female</td>
<td>50</td>
<td>49</td>
<td>44</td>
<td>53</td>
<td>51</td>
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<tr>
<td>Region</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16.3</td>
</tr>
<tr>
<td>Northeast</td>
<td>17%</td>
<td>20%</td>
<td>19%</td>
<td>18%</td>
<td>24%</td>
<td></td>
</tr>
<tr>
<td>Mid-West</td>
<td>21</td>
<td>29</td>
<td>23</td>
<td>21</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>West</td>
<td>29</td>
<td>16</td>
<td>21</td>
<td>33</td>
<td>23</td>
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</tr>
<tr>
<td>South</td>
<td>32</td>
<td>33</td>
<td>36</td>
<td>28</td>
<td>36</td>
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</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5.9</td>
</tr>
<tr>
<td>White/Caucasian</td>
<td>81%</td>
<td>83%</td>
<td>76%</td>
<td>72%</td>
<td>82%</td>
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</tr>
<tr>
<td>Non-White/Caucasian</td>
<td>19</td>
<td>17</td>
<td>24</td>
<td>28</td>
<td>18</td>
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</tr>
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<td>Employment Status</td>
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<td></td>
<td></td>
<td>13.3</td>
</tr>
<tr>
<td>Employed (full or part-time)</td>
<td>72%</td>
<td>63%</td>
<td>70%</td>
<td>70%</td>
<td>72%</td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>13</td>
<td>25</td>
<td>16</td>
<td>13</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Other (student or retired)</td>
<td>15</td>
<td>9</td>
<td>11</td>
<td>16</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Highest Degree Earned</td>
<td>6%</td>
<td>18%</td>
<td>10%</td>
<td>7%</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>-----------------------</td>
<td>----</td>
<td>-----</td>
<td>-----</td>
<td>----</td>
<td>----</td>
<td></td>
</tr>
<tr>
<td>High School (Secondary School) Degree or Less</td>
<td>72</td>
<td>66</td>
<td>74</td>
<td>72</td>
<td>74</td>
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<tr>
<td>Some College or College graduate</td>
<td>22</td>
<td>16</td>
<td>16</td>
<td>20</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Graduate or Professional degree</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
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<table>
<thead>
<tr>
<th>Relationship Status</th>
<th>13.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never Married</td>
<td>47%</td>
</tr>
<tr>
<td>Married</td>
<td>46</td>
</tr>
<tr>
<td>Widowed or Divorced</td>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Current Living Status</th>
<th>19.4*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alone</td>
<td>15%</td>
</tr>
<tr>
<td>With Romantic partner/spouse</td>
<td>63</td>
</tr>
<tr>
<td>With Others (e.g., parents or family, roommate)</td>
<td>21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Previous Abnormal Psychology Course</th>
<th>2.4</th>
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</thead>
<tbody>
<tr>
<td>Yes</td>
<td>21%</td>
</tr>
<tr>
<td>No</td>
<td>80</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Political Orientation</th>
<th>2.70(1.16)</th>
<th>2.47(1.15)</th>
<th>2.50(1.13)</th>
<th>2.31(1.17)</th>
<th>2.43(1.19)</th>
</tr>
</thead>
</table>

*a* Note that percentages are based on the number responding to each question and may not add up to 100% due to rounding.

*b* No more than three participants in each condition declined to respond to any one item.

*c* Based on question about political orientation on 5-point scale from 1=Liberal to 5=Conservative.

*p* < .05
Table 2

Demographic Characteristics of Entire Sample Compared to 2010 Census Data

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Overall Sample (n = 612)</th>
<th>2010 Census Data</th>
<th>Chi Square/t-test(^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-44</td>
<td>82%</td>
<td>48%</td>
<td>281**</td>
</tr>
<tr>
<td>45 and Older</td>
<td>18%</td>
<td>52%</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>51%</td>
<td>49%</td>
<td>1</td>
</tr>
<tr>
<td>Female</td>
<td>49%</td>
<td>51%</td>
<td></td>
</tr>
<tr>
<td>Region</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northeast</td>
<td>20%</td>
<td>18%</td>
<td>4</td>
</tr>
<tr>
<td>Mid-West</td>
<td>22%</td>
<td>22%</td>
<td></td>
</tr>
<tr>
<td>West</td>
<td>25%</td>
<td>23%</td>
<td></td>
</tr>
<tr>
<td>South</td>
<td>33%</td>
<td>37%</td>
<td></td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White/Caucasian</td>
<td>79%</td>
<td>72%</td>
<td>13**</td>
</tr>
<tr>
<td>Non-White/Caucasian</td>
<td>21%</td>
<td>28%</td>
<td></td>
</tr>
<tr>
<td>Employment Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed (full or part-time)</td>
<td>70%</td>
<td>59%</td>
<td>226**</td>
</tr>
<tr>
<td>Unemployed</td>
<td>17%</td>
<td>6%</td>
<td></td>
</tr>
<tr>
<td>Other (e.g., student or retired)</td>
<td>12%</td>
<td>35%</td>
<td></td>
</tr>
<tr>
<td>Highest Degree Earned</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High School (Secondary School)</td>
<td>10%</td>
<td>45%</td>
<td>313**</td>
</tr>
<tr>
<td>Degree or Less</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some College or College graduate</td>
<td>72%</td>
<td>46%</td>
<td></td>
</tr>
<tr>
<td>Graduate or Professional degree</td>
<td>19%</td>
<td>9%</td>
<td></td>
</tr>
<tr>
<td>Relationship Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never Married</td>
<td>57%</td>
<td>27%</td>
<td>286**</td>
</tr>
<tr>
<td>Married</td>
<td>34%</td>
<td>57%</td>
<td></td>
</tr>
<tr>
<td>Widowed or Divorced</td>
<td>9%</td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td>Current Living Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alone</td>
<td>22%</td>
<td>13%</td>
<td>52**</td>
</tr>
<tr>
<td>With Romantic partner/spouse</td>
<td>49%</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>With Others (e.g., parents or family, roommate)</td>
<td>28%</td>
<td>37%</td>
<td></td>
</tr>
</tbody>
</table>

\(a\) Note that percentages may not add up to 100% due to rounding.

\(b\) No more than eight participants (1.3% of total sample) declined to respond to any one item.

\(p<.05, \quad ** \quad p<.01\)
Table 3

*Means and Standard Deviations of Dependent Measures by Condition.*

<table>
<thead>
<tr>
<th>Condition</th>
<th>Social Distance$^a$</th>
<th>Compulsive Subscale$^b$</th>
<th>Appetitive Subscale$^b$</th>
<th>Perceptions Treatment$^c$</th>
<th>Addictive Potential$^d$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gambling</td>
<td>3.0(.5)</td>
<td>4.4(.5)</td>
<td>3.6(.9)</td>
<td>4.2(.5)</td>
<td>2.6(1.0)</td>
</tr>
<tr>
<td>Pornography</td>
<td>2.9(.6)</td>
<td>4.1(.8)</td>
<td>3.0(1.1)</td>
<td>4.0(.5)</td>
<td>2.4(1.0)</td>
</tr>
<tr>
<td>Alcohol</td>
<td>3.1(.6)</td>
<td>4.4(.6)</td>
<td>3.5(.9)</td>
<td>4.2(.5)</td>
<td>2.8(1.0)</td>
</tr>
<tr>
<td>Marijuana</td>
<td>2.9(.7)</td>
<td>4.1(.6)</td>
<td>2.7(1.1)</td>
<td>4.1(.6)</td>
<td>2.2(1.1)</td>
</tr>
<tr>
<td>Heroin</td>
<td>3.5(.4)</td>
<td>4.6(.4)</td>
<td>3.8(1.0)</td>
<td>4.1(.4)</td>
<td>4.5(0.64)</td>
</tr>
<tr>
<td>$F$-test</td>
<td>31.4**</td>
<td>13.5**</td>
<td>23.6**</td>
<td>4.8**</td>
<td>116.6**</td>
</tr>
</tbody>
</table>

$\eta^2$ | .01 | .08 | .13 | .03 | .43

$^a$Based on 4-point scale from 1=Definitely willing to 4=Definitely unwilling  
$^b$Based on 5-point scale from 1= Not at all to 5= Very much  
$^c$Based on 5-point scale from 1= Very harmful to 5= Very beneficial  
$^d$Based on 5-point scale from 1= Not at all addictive to 5= Extremely addictive
Table 4

Means and Standard Deviations for Potential Causes of Addiction by Condition

<table>
<thead>
<tr>
<th></th>
<th>Character problem</th>
<th>Chemical Imbalance</th>
<th>Genetic Way raised</th>
<th>Trauma</th>
<th>Stress</th>
<th>Social Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gambling</strong></td>
<td>3.1(1.1)</td>
<td>3.7(1.0)</td>
<td>3.1(1.1)</td>
<td>3.3(1.0)</td>
<td>3.0(1.0)</td>
<td>4.0(.9)</td>
</tr>
<tr>
<td><strong>Pornography</strong></td>
<td>2.9(1.1)</td>
<td>3.3(1.1)</td>
<td>2.7(1.1)</td>
<td>3.3(1.1)</td>
<td>3.4(1.2)</td>
<td>3.6(.9)</td>
</tr>
<tr>
<td><strong>Alcohol</strong></td>
<td>2.9(1.2)</td>
<td>3.6(1.1)</td>
<td>3.7(1.1)</td>
<td>3.6(1.1)</td>
<td>3.7(1.1)</td>
<td>4.1(1.0)</td>
</tr>
<tr>
<td><strong>Marijuana</strong></td>
<td>2.7(1.3)</td>
<td>3.2(1.2)</td>
<td>2.8(1.2)</td>
<td>2.9(1.2)</td>
<td>3.0(1.1)</td>
<td>3.7(1.1)</td>
</tr>
<tr>
<td><strong>Heroin</strong></td>
<td>3.0(1.1)</td>
<td>3.4(1.0)</td>
<td>3.2(1.0)</td>
<td>3.5(1.0)</td>
<td>3.6(.9)</td>
<td>3.9(.9)</td>
</tr>
<tr>
<td><strong>F-test</strong></td>
<td>1.5</td>
<td>3.9**</td>
<td>15.9**</td>
<td>6.7**</td>
<td>11.9**</td>
<td>4.8**</td>
</tr>
<tr>
<td>(\eta^2)</td>
<td>-</td>
<td>.02</td>
<td>.09</td>
<td>.04</td>
<td>.07</td>
<td>.03</td>
</tr>
</tbody>
</table>

*\(p<.05\), **\(p<.01\)

a Based on a 5-point scale from 1=Very unlikely to 5=Very likely
Table 5

Means (SDs) and Paired-Samples t-tests Comparing Appetitive and Compulsive Subscales of Subjective Definitions of Addiction Scale

<table>
<thead>
<tr>
<th>Condition</th>
<th>Appetitive subscale M(SD)</th>
<th>Compulsive subscale M(SD)</th>
<th>Paired t-test result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gambling</td>
<td>3.6(.9)</td>
<td>4.4(.5)</td>
<td>( t(126)=-12.5, p&lt;0.001 )</td>
</tr>
<tr>
<td>Pornography</td>
<td>3.0(1.1)</td>
<td>4.1(.8)</td>
<td>( t(111)=-9.4, p&lt;0.001 )</td>
</tr>
<tr>
<td>Alcohol</td>
<td>3.5(.9)</td>
<td>4.4(.6)</td>
<td>( t(117)=-11.0, p&lt;0.001 )</td>
</tr>
<tr>
<td>Marijuana</td>
<td>2.7(1.1)</td>
<td>4.1(.6)</td>
<td>( t(122)=-14.7, p&lt;0.001 )</td>
</tr>
<tr>
<td>Heroin</td>
<td>3.8(1.0)</td>
<td>4.6(.4)</td>
<td>( t(131)=-10.5, p&lt;0.001 )</td>
</tr>
</tbody>
</table>
Table 6

*Intercorrelations Among Five Key Dependent Measures in the Gambling Condition*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Social Distance</th>
<th>Compulsive Subscale</th>
<th>Appetitive Subscale</th>
<th>Addictive Potential(^a)</th>
<th>Perceptions Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compulsive Subscale</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appetitive Subscale</td>
<td>.30**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Addictive Potential(^a)</td>
<td>-.13</td>
<td>-.04</td>
<td>.19*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceptions Treatment</td>
<td>.14</td>
<td>.48**</td>
<td>.18*</td>
<td>-.11</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) Based on question about addictiveness of behavior/substance on scale from 1=Not at all addictive to 5=Extremely addictive.

\(*p<.05, **p<.01\)
Table 7

*Intercorrelations Among Five Key Dependent Measures in the Pornography Condition*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Social Distance</th>
<th>Compulsive Subscale</th>
<th>Appetitive Subscale</th>
<th>Addictive Potential&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Perceptions Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compulsive Subscale</td>
<td>.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appetitive Subscale</td>
<td>.33**</td>
<td>.24*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Addictive Potential&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.03</td>
<td>-.14</td>
<td>.23*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceptions Treatment</td>
<td>-.00</td>
<td>.22*</td>
<td>.04</td>
<td>-.23*</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Based on question about addictiveness of behavior/substance on scale from 1=Not at all addictive to 5=Extremely addictive.

*<sup>p</sup><.05, **<sup>p</sup><.01
**Table 8**

*Intercorrelations Among Five Key Dependent Measures in the Alcohol Condition*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Social Distance</th>
<th>Compulsive Subscale</th>
<th>Appetitive Subscale</th>
<th>Addictive Potential&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Perceptions Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compulsive Subscale</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.27**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appetitive Subscale</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.32**</td>
<td>.33**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Addictive Potential&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.11</td>
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<td></td>
<td>.31**</td>
<td>.53**</td>
<td>.21*</td>
<td>.16</td>
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</tr>
</tbody>
</table>

<sup>a</sup> Based on question about addictiveness of behavior/substance on scale from 1=Not at all addictive to 5=Extremely addictive.

*p<.05, **p<.01
Table 9

*Intercorrelations Among Five Key Dependent Measures in the Marijuana Condition*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Social Distance</th>
<th>Compulsive Subscale</th>
<th>Appetitive Subscale</th>
<th>Addictive Potential&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Perceptions Treatment</th>
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<td>.29**</td>
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<tr>
<td>Appetitive Subscale</td>
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<td>.43**</td>
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<td>.15</td>
<td>.36**</td>
<td>.14</td>
<td>.20*</td>
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</table>

<sup>a</sup> Based on question about addictiveness of behavior/substance on scale from 1=*Not at all addictive* to 5=*Extremely addictive*.

*<sup>p</sup><.05, **<sup>p</sup><.01
Table 10

*Intercorrelations Among Five Key Dependent Measures in the Heroin Condition*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Social Distance</th>
<th>Compulsive Subscale</th>
<th>Appetitive Subscale</th>
<th>Addictive Potential&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Perceptions Treatment</th>
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</thead>
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<td>.36**</td>
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<td>.16</td>
<td>.06</td>
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</table>

<sup>a</sup> Based on question about addictiveness of behavior/substance on scale from 1= *Not at all addictive* to 5= *Extremely addictive.*

*<sup>p</sup><.05, **<sup>p</sup><.01*
Figure 1. Flowchart Illustrating Reasons for Eliminating Participants from Initial Sample

Initial Total Sample
(n=663)

- Subjects who answered less than 90 percent of items
  (n=10)
- Subjects who did not pass the attention checks and/or eligibility
  (n=19)
- Subjects who spent a long time on the survey
  (n=13)
- Subjects who endorsed mutually exclusive levels of contact
  (n=9)

Final Sample
(n=612)
Figure 2. Participant Perceptions of Potential Causes of Gambling Addiction.
Figure 3. Participant Perceptions of Potential Causes of Pornography Addiction.
Figure 4. Participant Perceptions of Potential Causes of Alcohol Addiction.
Figure 5. Participant Perceptions of Potential Causes of Marijuana Addiction.

- Social Pressure
- Stress
- Trauma
- Way Raised
- Genetic
- Chemical Imbalance
- Character Flaw

- Unlikely
- Equally Likely as Unlikely
- Likely
Figure 6. Participant Perceptions of Potential Causes of Heroin Addiction.
APPENDIX A. SOCIAL DESIRABILITY SCALE

Directions: Below you will find a list of statements. Please read each statement carefully and decide if that statement describes you or not. If it describes you, check the word “true”; if not, check the word “false.”

1. I sometimes litter.

2. I always admit my mistakes openly and face the potential negative consequences.

3. In traffic I am always polite and considerate of others.

4. I always accept others’ opinions, even when they don’t agree with my own.

5. I take out my bad moods on others now and then.

6. There has been an occasion when I took advantage of someone else.

7. In conversations I always listen attentively and let others finish their sentences.

8. I never hesitate to help someone in case of emergency.

9. When I have made a promise, I keep it - no ifs, ands or buts.

10. I occasionally speak badly of others behind their back.

11. I would never live off other people.

12. I always stay friendly and courteous with other people, even when I am stressed out.

13. During arguments I always stay objective and matter-of-fact.

14. There has been at least one occasion when I failed to return an item that I borrowed.

15. I always eat a healthy diet.

16. Sometimes I only help because I expect something in return.

Scoring: Score “true” responses 1 point and “false” responses 0 points. Items 1, 5, 6, 10, 14, 16 are reverse-scored.
APPENDIX B. SOCIAL DISTANCE SCALE

Directions: Please rate how willing you would be to engage in the following behaviors, using the scale below.

1. Definitely Willing
2. Probably Willing
3. Probably Unwilling
4. Definitely Unwilling

1. How willing would you be to rent a room in your home to someone with a [behavioral or substance addiction]?
2. How willing would you be to work on the same job as someone with a [behavioral or substance addiction]?
3. How willing would you be to have someone with a [behavioral or substance addiction] as a neighbor?
4. How willing would you be to have someone with a [behavioral or substance addiction] as the caretaker of your children for a couple of hours?
5. How willing would you be to have your children marry someone with a [behavioral or substance addiction]?
6. How willing would you be to introduce someone with a [behavioral or substance addiction] to a young woman/man you are friends with?
7. How willing would you be to recommend someone with a [behavioral or substance addiction] for a job working for a friend of yours?

[behavioral or substance addiction] will be replaced with “gambling addiction”, “sex addiction”, “alcohol addiction”, “marijuana addiction”, or “heroin addiction.”
APPENDIX C. LEVEL OF CONTACT REPORT

Directions: Please read each of the following statements carefully. Click all of the statements that describe your exposure to people with a [behavioral or substance addiction] across your entire lifetime.

1. I have never observed a person that I was aware had a [behavioral or substance addiction].

2. I have observed, in passing, a person I believe may have had a [behavioral or substance addiction].

3. I have watched a movie or television show in which a character depicted a person with a [behavioral or substance addiction].

4. I have watched a documentary on the television about [behavioral or substance addiction].

5. I have observed persons with a [behavioral or substance addiction] on a frequent basis.

6. I have worked with a person who had a [behavioral or substance addiction] at my place of employment.

7. My job includes providing services to persons with a [behavioral or substance addiction].

8. My job involves providing services/treatment for persons with a [behavioral or substance addiction].

9. A friend of the family has a [behavioral or substance addiction].

10. I have a relative who has a [behavioral or substance addiction].

11. I live with a person who has a [behavioral or substance addiction].

12. I have a [behavioral or substance addiction].

[behavioral or substance addiction] will be replaced with “gambling addiction”, “sex addiction”, “alcohol addiction”, “marijuana addiction”, or “heroin addiction.”
APPENDIX D. SUBJECTIVE DEFINITIONS OF ADDICTION SCALE

Directions: When people say that someone is “addicted” to [behavior or substance], the word “addicted” can mean different things to different people. How much would the following indicate to you that someone was addicted to [behavior or substance]? After each statement, choose the answer that is closest to the way you feel.


1. Not being able to stop doing the behavior anytime they want.
2. Needing to do the behavior more and more to feel OK.
3. Getting high.
4. Not being able to control the behavior.
5. Thinking about the behavior almost all the time.
6. Feeling bad when they cannot do the behavior.
7. Giving up things they like so they can do the behavior.
8. Feeling like they need the behavior.
9. Trying to stop doing the behavior but they cannot.
10. Liking the behavior a lot.
11. Doing the behavior first thing in the morning.
12. Doing the behavior when their friends do not approve.
13. Doing the behavior even if they could get in trouble for it.

[behavior or substance] will be replaced with “gambling”, “sex”, “alcohol”, “marijuana”, or “heroin.”
APPENDIX E. DEMOGRAPHICS QUESTIONNAIRE

1. How old are you? ________ (0-100, increments of 1 year)

2. Have you ever completed a course in Abnormal Psychology?
   Yes  No

3. Please select your gender.
   Male Female  Other __________  Decline to Respond

4. Please select your ethnicity.
   White/Caucasian  Asian/Pacific Islander/Pacific Rim  Black/African American  Native American/First Nation  Latino(a)/Hispanic Other ____________  Decline to Respond

5. What is the highest grade of school you have completed or the highest degree you have received?
   High school or less
   Some College or College graduate
   Graduate or Professional School

6. What is your current marital status?
   Never Married  Married  Widowed  Divorced

7. What is your current employment status?
   Employed full-time  Employed part-time  Unemployed  Student  Retired

8. Who do you currently live with?
   Alone  With parents or family  With romantic partner/spouse  With roommate

9. Where do you currently live?
   Northeast (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont, New Jersey, New York, Pennsylvania)
   Midwest (Indiana, Illinois, Michigan, Ohio, Wisconsin, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota)
   South (Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia, Alabama, Kentucky, Mississippi, Tennessee, Arkansas, Louisiana, Oklahoma, Texas)
Perceptions of Behavioral and Substance Addictions

West (Alaska, California, Hawaii, Oregon, Washington, Arizona, Colorado, Idaho, New Mexico, Montana, Utah, Nevada, Wyoming)

10. What is your political orientation?

1  2  3  4  5
Liberal  Moderate  Conservative
APPENDIX F. SUBJECTIVE ETIOLOGY QUESTIONNAIRE

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
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<tbody>
<tr>
<td>Very</td>
<td>Somewhat</td>
<td>Equally</td>
<td>Somewhat</td>
<td>Very</td>
</tr>
<tr>
<td>Unlikely</td>
<td>Unlikely</td>
<td>Likely as Unlikely</td>
<td>Likely</td>
<td>Likely</td>
</tr>
</tbody>
</table>

1. In your opinion, how likely is it that [behavioral or substance addiction] might be caused by a character problem or flaw?

2. In your opinion, how likely is it that [behavioral or substance addiction] might be caused by a chemical imbalance in the brain?

3. In your opinion, how likely is it that [behavioral or substance addiction] might be caused by a genetic or inherited problem?

4. In your opinion, how likely is it that [behavioral or substance addiction] might be caused by the way a person was raised?

5. In your opinion, how likely is it that [behavioral or substance addiction] might be caused by exposure to traumatic events in early childhood?

6. In your opinion, how likely is it that [behavioral or substance addiction] might be caused by stressful circumstances in a person’s life?

7. In your opinion, how likely is it that [behavioral or substance addiction] might be caused by social pressure from others?

[behavioral or substance addiction] will be replaced with “gambling addiction”, “sex addiction”, “alcohol addiction”, “marijuana addiction”, or “heroin addiction.”
APPENDIX G. PERCEPTIONS OF TREATMENT EFFECTIVENESS QUESTIONNAIRE

1) How likely is it that [behavioral or substance addiction] is a mental illness?

1 2 3 4 5
Very Somewhat Equally Somewhat Very
Unlikely Unlikely Likely as Unlikely Likely Likely

2) How addictive is [behavior or substance] for most people?

1 2 3 4 5
Not at all Slightly Somewhat Very Extremely
Addictive Addictive Addictive Addictive Addictive

3) How likely is it that someone with [behavioral or substance addiction] would no longer have [behavioral or substance addiction] without treatment?

1 2 3 4 5
Very Somewhat Equally Somewhat Very
Unlikely Unlikely Likely as Unlikely Likely Likely

4) How effective would the following treatments be for reducing addiction-related problems for someone with [behavioral or substance addiction]?

1 2 3 4 5
Very Somewhat No effect Somewhat Very
Harmful Harmful Beneficial Beneficial

A) Use will power to just stop doing it.
B) Attend a support group for individuals with similar problems.
C) Attend individual counseling with a therapist.
D) Take medication prescribed by a medical doctor.
E) Get help for the problem from family/friends.
F) Read about the problem using books, magazines, online information, pamphlets, etc.
G) Attend group therapy led by a therapist with others who have similar problems.
H) Other ______ (open-ended)

[behavioral or substance addiction] will be replaced with “gambling addiction”, “sex addiction”, “alcohol addiction”, “marijuana addiction”, or “heroin addiction.”

[behavior or substance] will be replaced with “gambling”, “sex”, “alcohol”, “marijuana”, or “heroin.”
APPENDIX H. LIST OF ACRONYMS

SUD: Substance Use Disorder

DSM-5: Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition

ANOVA: Analysis of Variance

SDS-17: Social Desirability Scale-17
APPENDIX I. HUMAN SUBJECTS REVIEW BOARD APPROVAL LETTER

DATE: June 16, 2015

TO: Brent Lang, B.A.
FROM: Bowling Green State University Human Subjects Review Board

PROJECT TITLE: [760414-1] Lay Perceptions of Behavioral and Substance Addictions

SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS

DECISION DATE: June 15, 2015

REVIEW CATEGORY: Exemption category # 2

Thank you for your submission of New Project materials for this project. The Bowling Green State University Human Subjects Review Board has determined this project is exempt from IRB review according to federal regulations AND that the proposed research has met the principles outlined in the Belmont Report. You may now begin the research activities.

Note that an amendment may not be made to exempt research because of the possibility that proposed changes may change the research in such a way that it is no longer meets the criteria for exemption. A new application must be submitted and reviewed prior to modifying the research activity, unless the researcher believes that the change must be made to prevent harm to participants. In these cases, the Office of Research Compliance must be notified as soon as practicable.

We will retain a copy of this correspondence within our records.

If you have any questions, please contact Kristin Hagemyer at 419-372-7716 or khagemy@bgsu.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Bowling Green State University Human Subjects Review Board's records.