Summer 2012

Proposed DSM-5 personality traits and substance use: A multi-faceted study

W. Reese Mayer

PROPOSED *DSM-5* PERSONALITY TRAITS AND SUBSTANCE USE: A MULTI-FACETED STUDY

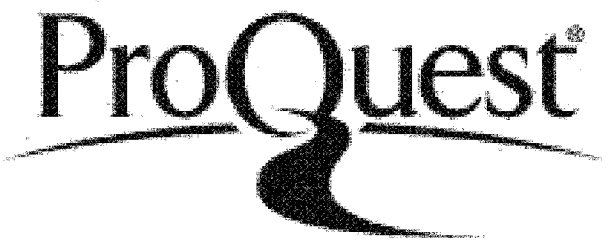
by

W. Reese Mayer, B.S., M.A.

A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

COLLEGE OF EDUCATION
LOUISIANA TECH UNIVERSITY

August 2012



ProQuest LLC
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106-1346

LOUISIANA TECH UNIVERSITY

THE GRADUATE SCHOOL

July 1, 2012

Date

We hereby recommend that the dissertation prepared under our supervision by William Reese Mayer

entitled Proposed DSM-5 Personality Traits and Substance Use: A Multi-Faceted Study

be accepted in partial fulfillment of the requirements for the Degree of Doctor of Philosophy in Counseling Psychology

Supervisor of Dissertation Research

Head of Department

Psychology and Behavioral Sciences

Department

Recommendation concurred in:

Advisory Committee

Approved:

Director of Graduate Studies

Approved:

Dean of the Graduate School

Dean of the College

GS Form 13a
(6/07)

ABSTRACT

In this study, the Brief Assessment of Traits – 37 (BAT37) was developed to measure the presence of the personality traits initially proposed for inclusion in the personality disorders section of the *DSM-5*. The structure of the measure was supported by the results of a pilot study and its construct validity was supported by correlations with theoretically-related scales from the PAI, DAPP-BQ, and HEXACO-PI-R. The BAT37 was administered to a sample of undergraduate college students and clients at a residential substance use disorder (SUD) treatment facility.

Several of this study's findings are relevant to the proposed changes to the personality disorders section of the *DSM-5*. The initially proposed *DSM-5* traits were indicated to be measuring independent constructs which need not be reduced in number due to concerns about intercorrelations between traits. However, the changes made to the initial *DSM-5* proposal and included in the revised *DSM-5* proposal were reasonably well-supported by this study's findings. The results of an exploratory factor analysis of the BAT37 traits suggested a factor structure that is similar to the factors of the Five Factor Model.

Regarding the relationship between personality pathology and substance use, the results of this study indicated that personality traits consistent with both disinhibition-related and self-medication theories of SUD etiology were indicated to precede problematic substance use in individuals. Unexpectedly, BAT37 traits related to compulsivity were consistently indicated to have preceded SUDs and to be present in

individuals with SUDs. Traits related to behavioral disinhibition were most prominently found to increase in the period between non-problematic substance use and SUDs; traits related to negative emotionality and problems in interpersonal functioning were also indicated to increase in tandem with substance use. Findings did not support the existence of a personality-based typology of individuals with SUDs. Personality pathology in general was suggested to be predictive of SUDs, both presently and prospectively, and results indicated that the more severe an individual's personality pathology, the more likely he or she is to abuse multiple substances. Possible reasons for these findings are discussed. Limitations of the study and recommendations for future research are discussed.

APPROVAL FOR SCHOLARLY DISSEMINATION

The author grants to the Prescott Memorial Library of Louisiana Tech University the right to reproduce, by appropriate methods, upon request, any or all portions of this Dissertation. It is understood that "proper request" consists of the agreement, on the part of the requesting party, that said reproduction is for his personal use and that subsequent reproduction will not occur without written approval of the author of this Dissertation. Further, any portions of the Dissertation used in books, papers, and other works must be appropriately referenced to this Dissertation.

Finally, the author of this Dissertation reserves the right to publish freely, in the literature, at any time, any or all portions of this Dissertation.

Author W. R. Mayes

Date 7/1/12

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACKNOWLEDGMENTS

Countless people have helped me get to this point, far too many to include here.

To Mom, Dad, Evan, and Brett: You have always unconditionally supported and encouraged me, and I am incredibly fortunate to have you as my family.

To the Louisiana Tech psychology faculty, particularly Dr. Young: Thank you for giving me every opportunity to become a competent and confident psychologist.

And finally, to Carly, my wife and best friend: We made it! Thank you for always being there, no matter what.

CHAPTER ONE
INTRODUCTION

Personality and Substance Use

Decades of extensive scientific inquiry into the factors that contribute to substance use disorders (SUDs) have given rise to mixed, and sometimes contradictory, empirical findings and theoretical explanations. A comprehensive review of relevant literature reveals that considerable nebulousness surrounds research on problematic substance use. Most contemporary experts on the topic have come to suggest that the pathways to SUDs are dictated by subjective circumstances and involve a complex interplay of biological, psychological, and social influences (Scheier, 2010). Although proposed relationships between most discrete factors and SUDs have been met with equivocal support, personality traits – patterns of thinking, feeling, and/or behaving that remain relatively stable over the course of an individual's life – have transcended this trend to an arguably unparalleled degree and have emerged as important in understanding the etiology and maintenance of SUDs.

Disinhibition and Substance Use

The most consistently supported personality-based risk factors for problematic substance use have been those related to poor self-regulation and a general lack of restraint. This is a heavily-researched construct which has been described using various terms (Carver, 2005), but for the purposes of this paper is called disinhibition.

In 1987, Cloninger proposed novelty seeking as a biologically-based dimension of personality. High scorers on the novelty seeking scales of the Tridimensional Personality Questionnaire (Cloninger, Przybeck, & Svrakic, 1991) and Temperament and Character Inventory (Cloninger, Przybeck, Svrakic, & Wetzel, 1994; Cloninger, Svrakic, & Przybeck, 1993) tend to show a propensity toward exploration, distractibility, and positive responsiveness to novel stimuli, and low scorers on the scale are typically orderly, rigid, and less responsive to such stimuli. High novelty seeking has proven to be a robust predictor of substance use and has been associated with excessive use of opiates (LeBon et al., 2004; Vukov, Baba-Milkic, Lecic, Mijalkovic, & Marinkovic, 1995) and alcohol (LeBon et al.), as well as smoking of tobacco (Pomerleau, Pomerleau, Flessland, & Basson, 1992; Wills, Vaccaro, & McNamara, 1994), alcohol and marijuana use (Wills et al., 1994; Van Ammers, Sellman, & Mulder, 1997), alcohol misuse in early adolescence (George, Connor, Gullo, & Young, 2010), greater frequency and quantity of alcohol consumption (Galen, Henderson, & Whitman, 1997), and greater frequency of alcohol and marijuana use (Chakroun, Johnson, & Swendsen, 2010). Sher, Bartholow, and Wood (2000) administered the Tridimensional Personality Questionnaire to individuals during their freshman year of college, and then again two, three, four, and seven years following the initial administration. They found high scores on the novelty seeking scale to be predictive of the presence of alcohol use disorders, drug use disorders, and tobacco dependence in participants, both cross-sectionally and prospectively.

Zuckerman's sensation seeking is a construct which is similar to novelty seeking (Zuckerman, 2007; Zuckerman & Cloninger, 1996). Zuckerman suggests that sensation seeking is also a biologically-based personality dimension and that high sensation seekers

possess a preference for arousing internal experiences and a low threshold for tolerance of boredom. High scores on his Sensation Seeking Scale (1979) have been related to the use of opioids (Franques et al., 2003), alcohol (Ham & Hope, 2003; Zuckerman, 2007), heroin (Craig, 1982, 1986), and stimulants (Ball, Carroll, Babor, & Rounsaville, 1995; Ersche, Turton, Pradhan, Bullmore, & Robbins, 2010) in various populations; as well as substances in general by adolescents (Teichman, Barnes, & Rahav, 1989; von Knorring, Oreland, & von Knorring, 1987) and college students (Galizio, Rosenthal, & Stein, 1983; Jaffe & Archer, 1987; Teichman et al.). Research on Cloninger's (1987) novelty seeking and Zuckerman's (1979; 2007) sensation seeking has been integral in highlighting disinhibition's relationship with SUDs and substance use in general.

Similar findings about the relationship between disinhibition and substance use have been made outside of Cloninger's (1987) and Zuckerman's (2007) frameworks. Studies utilizing alternate measures of sensation seeking have indicated the construct to be predictive of risky alcohol use behavior among college students (Miller & Quick, 2010) and Mexican origin youth (Wilkinson, Shete, Spitz, & Swann, 2011), as well as substance misuse in general among adolescents (Castellanos-Ryan & Conrod, 2011). Conway, Swendsen, Rounsaville, and Merikangas (2002) conducted a study using the Multidimensional Personality Questionnaire (Tellegen, 1985) and found that individuals with SUDs demonstrated significantly lower levels of constraint than those without SUDs. Hicks, Iacono, and McGue's (2010) longitudinal study exploring alcohol use in males found that measures of behavioral disinhibition were positively predictive of earlier onset of alcohol use disorders as well as a persistent course of alcohol use disorders. The results of several studies (Hopwood, Baker, & Morey, 2008; Krueger et al., 2002;

Rielage, Hoyt, & Renshaw, 2010) have indicated that SUDs are generally more strongly associated with a broad externalizing, rather than internalizing, dimension of personality. An experience-sampling study by Neal and Carey (2007) found that among college students, variables related to disinhibition are positively correlated with the likelihood of negative consequences stemming from alcohol intoxication.

A recent meta-analysis (Kotov, Gamez, Schmidt, & Watson, 2010) which used data from 175 studies to examine the relationships between various psychological disorders and the traits of several widely-studied personality models found that SUDs demonstrated a particularly distinct association with measures of disinhibition. Studies using a variety of measures have also suggested that among individuals who use substances, personality characteristics related to disinhibition are positively correlated with increased polysubstance use (Conway, Kane, Ball, Poling, & Rounsaville, 2003) as well as increased social deviance of drug of choice (Chakroun et al., 2010; Conway et al., 2002). Studies exploring personality traits of the Five Factor Model (Costa & McCrae, 1985) have consistently indicated a relationship between substance use and low conscientiousness (Ruiz, Pincus, & Dickinson, 2003; Terracciano, Lockenhoff, Crum, Bienvenu, & Costa, 2008; Walton & Roberts, 2004) and, perhaps somewhat less frequently, both low conscientiousness and low agreeableness (Kotov et al., 2010; Malouff, Thorsteinsson, & Schutte, 2006; Martin & Sher, 1994; McCormick, Dowd, Quirk, & Zegarra, 1998). These results are consistent with aforementioned studies, as low conscientiousness and low agreeableness, together, have been shown to represent a general tendency toward disinhibition (Markon, Krueger, & Watson, 2005).

Impulsivity, a construct closely related to disinhibition (if not synonymous on a broad level; Carver, 2005), has also been shown to be strongly related to substance use. A number of studies have utilized delay discounting methodology – in which participants are given the option of receiving a smaller, immediate reward or a larger, delayed reward – to measure impulsivity. It has been demonstrated consistently that individuals who use substances are more likely than control subjects to choose to receive the smaller, immediate rewards instead of the larger, delayed rewards (Bickel, Odum, & Madden, 1999; Heyman & Dunn, 2002; Kirby, Petry, & Bickel, 1999; Mitchell, 1999; Vuchinich & Simpson, 1998; Wulfert, Block, Ana, Rodriguez, & Colsman, 2002). Wulfert et al. found this preference for smaller, immediate rewards to be predictive of increased cigarette, alcohol, and marijuana consumption in both middle school and high school students – which is a particularly important finding given that adolescence has been indicated to be a period of heightened vulnerability to the development of problematic substance use (Thatcher & Clark, 2010). The results of a 2006 study by Heyman and Gibb further underscore the relevance of limited self-control to problematic substance use. Their findings indicate that within groups of people who use the same substance to the same extent, those who prefer the smaller, immediate rewards tend to report greater dependence on the substance.

It is suggested by de Wit (2009) that impulsivity is a multi-dimensional construct which is comprised of three underlying processes: behavioral disinhibition, insensitivity to consequences, and lapses of attention. Based on an extensive review of empirical findings, she proposes that these components of impulsivity not only predict substance use, but also increase in response to continued use and serve to facilitate the development

of SUDs. The crucial role of impulsivity in SUDs is also endorsed by George Koob (2009) and other contributors (e.g., Andrews et al., 2011; Everitt et al., 2008; Goldstein & Volkow, 2002) to the literature on the neurobiology of SUDs. Research on the brain activity correlates of substance use in both humans and other animals suggests that impulsivity and seeking of positive reinforcement typically dictate the early stages of SUDs before compulsivity and negative reinforcement become primary motivators for use in the later stages. The substantial progress in identifying the neural mechanisms underlying this process that has been made in recent years further emphasizes the importance of disinhibition in understanding problematic substance use.

Epidemiology research also supports the link between disinhibition and substance use, as psychological disorders marked by disruptive behavior and low self-control are frequently comorbid with SUDs (Chassin, Pitts, DeLucia, & Todd, 1999; Clark, Cornelius, Kirisci, & Tarter, 2005; Elkins, McGue, & Iacono, 2007; Tapert, Baratta, Abrantes, & Brown, 2002). A diagnosis of conduct disorder, for example, has been identified as one of the most salient predictors of excessive substance use in adolescence (Bukstein, 2000; Elkins et al.; Sartor, Lynskey, Heath, Jacob, & True, 2007); and attention-deficit / hyperactivity disorder has also been identified as often being comorbid with SUDs (Elkins et al.; Putnins, 2006; Thatcher & Clark, 2010). Individuals with personality disorders, as defined by the criteria of several editions of the American Psychiatric Association's (2000) *Diagnostic and Statistical Manual of Mental Disorders* (*DSM*), have also been shown to be more likely than those without personality disorders to meet diagnostic criteria for a SUD (Daudin et al., 2010; Grant et al., 2006; Markon & Krueger, 2005; Ray, Primack, Chelminski, Young, & Zimmerman, 2011; Vukov et al.,

1995; Wolf et al., 1988). Analyzing results from the National Epidemiologic Survey on Alcohol and Related Conditions, which collected data from over 43,000 United States citizens over age 18, Grant et al. (2006) found that 28.6% of those with alcohol use disorders and 47.7% of those with drug use disorders also had personality disorders. Cluster B personality disorders (antisocial, borderline, histrionic, and narcissistic personality disorder) – described in the text-revised, fourth edition of the *DSM* (*DSM-IV-TR*) as being marked by "dramatic, emotional, or erratic" (American Psychiatric Association, 2000, p. 685) tendencies – were indicated by Vukov et al. to be especially common in individuals with SUDs; and traits consistent with antisocial personality disorder are consistently found to be particularly strongly associated with SUDs (Grant, 2006; Hesselbrock & Hesselbrock, 2006; Jahng et al., 2011; Markon & Krueger; Ray et al.; Wolf et al.).

Some researchers (Ersche et al., 2010; Thatcher & Clark, 2010) have proposed that behavioral disinhibition may represent a heritable endophenotype or neurobiological vulnerability for the development of a variety of psychological disorders, including SUDs. Ersche et al. compared self-reported levels of impulsivity in 30 sibling pairs of stimulant-dependent individuals, their biological brothers and/or sisters who did not have a significant history of drug use, and 30 unrelated, non-using control participants. They found that although the stimulant users reported higher levels of impulsivity than both their siblings and the control participants, the reported levels of impulsivity of the stimulant users' siblings were also significantly higher than those of the control participants. Ersche et al. suggest that this finding indicates that impulsivity is a

genetically-based behavioral endophenotype which mediates risk for stimulant dependence.

Studies exploring the genetic pathways to problematic substance use have lent support to the possibility that disinhibitive personality traits represent biologically-based markers of vulnerability. Ravaja and Keltikangas-Jarvinen (2001) conducted a large-scale, longitudinal study of the relationship between parental alcohol use and smoking and the scales of the Temperament and Character Inventory (Cloninger et al., 1993) in the parents' offspring. They found that maternal and paternal frequency of alcohol consumption, frequency of intoxication from alcohol consumption, and tobacco consumption were positively related to their children's novelty seeking scores in young adulthood. The results of a study by Finn, Sharkansky, Brandt, & Turcotte (2000) indicated that family history of alcohol use disorder(s) significantly increased the likelihood of the development of problematic alcohol use through two distinct personality-based risk pathways: a social deviance proneness pathway that led directly to alcohol problems and an excitement/pleasure seeking pathway that was associated with increased drinking and, indirectly, with alcohol problems. Some have suggested, based on the results of longitudinal (Chassin et al., 1999), neurobiological (Andrews et al., 2011), and genetic research (Haber, Jacob, & Heath, 2005), that problematic substance use by parents is predictive of disruptive externalizing tendencies in offspring that may be severe enough to manifest in pathology. A twin study by Haber et al. found that offspring of alcohol-dependent fathers were more likely to warrant diagnoses of conduct disorder than offspring of non-alcohol-dependent fathers, and that genetic risk factors (i.e., paternal or twin alcohol-dependence) were significantly greater predictors of the presence

of the disorder in offspring than environmental risk factors (i.e., being reared by an alcohol-dependent father).

Several theories exist as to the nature of the relationship between disinhibition and SUDs. Heyman (2009) argues that a decision-making bias marked by excessive present-orientation and limited concern for future consequences is central to understanding the process by which non-disordered substance use can advance to the development of a SUD. He postulates that although many people use or have used licit and/or illicit substances, it is those who attend more closely to "local bookkeeping" than "global bookkeeping" who often go on to do so repeatedly and/or excessively. His assertion is supported by the results of a longitudinal study by Littlefield, Sher, and Wood (2009), who tracked a cohort of college students' personality characteristics (impulsivity, neuroticism, and extraversion) and involvement with alcohol between the ages of 18 and 35. Littlefield et al. found that changes in impulsivity and neuroticism were more strongly associated than any other variables (including parental and marital role changes) with increases or decreases in alcohol involvement. Participants who maintained high levels of impulsivity or demonstrated increasing levels of impulsivity were indicated to be significantly less likely than those with low or decreasing levels of impulsivity to "mature out" of problematic alcohol involvement over time.

Wills and Ainette (2010) suggest a less straightforward pathway between disinhibition and SUDs. Citing research which indicates that levels of self-control do not have direct effects on substance use outcomes (Wills, Windle, & Cleary, 1998), they propose that factors related to disinhibition influence substance use or nonuse through their effects on intermediate processes such as associations with substance using friends

(Glaser, Shelton, & van den Bree, 2010) or susceptibility to the influence of positive depictions of substance use in mass media (Wills et al., 2010). They argue that individuals with poor self-control are more likely to associate with deviant peers and provoke negative life events over time, thus increasing the likelihood of substance use. Those with good self-control, on the other hand, are more likely to engage in thoughtful planning and consideration of alternatives before acting in problem situations, thus decreasing their exposure to risk factors and, subsequently, their likelihood to use substances. In reviewing the literature on the ways that personality contributes to alcohol use disorders, Littlefield and Sher (2010) point out that seemingly contradictory explanations such as Heyman's (2009) and Wills and Ainette's (2010) need not necessarily be viewed as mutually exclusive from one another; and that high levels of disinhibition can propel individuals toward substance use for any number of potentially-simultaneous reasons.

Heterogeneity of Personality Among Substance Users

The empirical evidence discussed thus far indicates a clear link between disinhibition and SUDs. Research suggests that constructs related to disinhibition are predictive not only of substance use, but also of a wide array of risky behaviors, such as reckless driving (Wagner, 2001) and risky sexual behavior (Cooper, Agocha, & Sheldon, 2000; Wagner), as well as accident proneness (Clarke & Robertson, 2005). One meta-analysis (Bogg & Roberts, 2004) indicates a link between personality characteristics related to disinhibition and all risky health-related behaviors. It must be noted, however, that while disinhibitive traits likely account for a considerable portion of individuals with SUDs, they do not explain all cases of excessive substance use. Research has repeatedly

indicated that the SUD population is heterogeneous regarding personality as well as other relevant factors (Babor & Caetano, 2006; Babor et al., 1992; Ball et al., 1995; Buhler & Bardeleben, 2008; Cadoret, Troughton, & Widmer, 1984; Cloninger, 1987; Hall, Howard, & McCabe, 2010; Hauser & Rybakowski, 1997; Hesselbrock & Hesselbrock, 2006; Jellinek, 1960; Moss, Chen, & Yi, 2007; Scourfield, Stevens, & Merikangas, 1996; Windle & Scheidt, 2004).

Jellinek offered one of the earliest typologies of substance users when he described Alpha, Beta, Gamma, Delta, and Epsilon "species" of alcoholics in his 1960 book, *The Disease Concept of Alcoholism*. He suggested that Alpha alcoholics are able to abstain from alcohol for periods of time and control themselves when they do consume alcohol, but that they demonstrate a psychological reliance on alcohol as a means of coping with problems in life. Beta alcoholics are neither psychologically nor physically dependent on alcohol, but they are prone to health problems due to a combination of heavy drinking and inadequate diet. He considered the Gamma subtype – comprised of "loss of control" drinkers – to be the most devastating in terms of negative physical and social consequences, as well as the most common among the Alcoholics Anonymous participants which he studied. These individuals progressively develop increased tolerance to alcohol, physiological dependence with withdrawal symptoms, and a loss of control over their ability to manage their consumption. Delta alcoholics are similar to Gamma alcoholics in that they develop psychological and physical dependence to alcohol, but they are unique in that they demonstrate some capacity to control their consumption for brief periods. Finally, Jellinek indicated that Epsilon alcoholics drink on a more

periodic basis than the other four species, and that their consumption is marked by episodes of binge drinking.

More recently, Cloninger (1987) highlighted evidence from a variety of fields in proposing two types of individuals with SUDs (his initial work was concerned with alcohol use disorders, but he indicated that the same mechanisms apply to the use of other substances as well). "Type 1" alcoholism is characterized by low novelty seeking and high harm avoidance and reward dependence. He suggested that Type 1 alcoholics typically did not begin consuming alcohol excessively until after age 25, following an extended period of socially-encouraged drinking (e.g., with friends or co-workers); that they tend to exhibit passive-dependent and anxious personalities; and that they experience guilt stemming from their consumption, but dependence on the anxiety-reducing effects of alcohol. "Type 2" alcoholism is characterized by high novelty seeking and low harm avoidance and reward dependence, a configuration of traits which Cloninger suggests is representative of an antisocial personality. He indicated that Type 2 alcoholics tend to exhibit persistent seeking of alcohol for its euphoric effects, beginning at young ages regardless of their environment; and that they are typically impulsive and prone to risk taking and conduct problems. Type 1 alcoholics tend to abstain from alcohol for long periods of time but engage in prolonged, uncontrollable drinking binges, whereas Type 2 alcoholics typically struggle to abstain altogether. Some studies have found support for Cloninger's two types (Ball et al., 1995; Cloninger, Sigvardsson, and Bohman, 1988; Hubicka, Kallmen, Hiltunen, & Bergman, 2010; Wills et al., 1994), but others have not. As was discussed earlier, his novelty seeking personality dimension has proven highly predictive of both disordered and non-disordered substance use, but the personality

dimensions of harm avoidance and reward dependence have been indicated by some to be unrelated or minimally related to substance use (Chakroun et al., 2010; Galen et al., 1997; Sher et al., 2000; Van Ammers et al., 1997).

Despite the mixed support for Cloninger's (1987) framework, other researchers have presented evidence of two highly similar subtypes of alcoholism. Babor et al. (1992) collected in-treatment and follow-up data from measures of 17 characteristics – familial alcoholism, childhood conduct disorder, harm avoidance, reward dependence, age of onset of problem drinking, ounces of alcohol consumed per day, relief drinking, physical dependence, benzodiazepine use, polysubstance use, medical conditions, physical consequences, social consequences, lifetime severity, number of years of heavy drinking, depressive symptoms, antisocial personality symptoms, and severity of anxiety – from 321 males and females who received inpatient treatment for alcohol use disorders. Their data analyses of these variables indicated a dichotomous alcohol use disorder typology – comprised of "Type A" and "Type B" alcoholics – which strongly resembles Cloninger's two types. Type A alcoholics, similar to Cloninger's Type 1, are characterized by later onset of problem drinking, fewer behavioral issues in childhood, and less psychopathology; whereas Type B alcoholics, similar to Cloninger's Type 2, are characterized by a higher prevalence of childhood behavioral issues, earlier onset of problem drinking, evidence of alcoholism in other family members, more psychopathology, and a more chronic course of problem drinking and negative life events. Schuckit et al. (1995) replicated the method used in Babor et al.'s study in a different, larger sample of individuals with alcohol use disorders and found support for the same dual classification system. Indicating that the Type A and Type B (or, alternatively, the

Type 1 and Type 2) distinction applies to users of other drugs, Ball et al.'s 1995 study suggests that the typology accurately describes the heterogeneity of individuals who abuse cocaine as well.

Utilizing the Five Factor Model (Costa & McCrae, 1985) in college student samples, several researchers have identified separate motivational pathways to alcohol consumption which share similarities with Cloninger's (1987) and Babor et al.'s (1992) typologies (Mezquita, Stewart, & Ruiperez, 2010; Stewart & Devine, 2000; Stewart, Loughlin, & Rhyno, 2001; Theakston, Stewart, Dawson, Knowlden-Loewen, & Lehman, 2004). Distinct personality traits are typically associated with two broad categories of reasons for drinking alcohol: positive reinforcement (e.g., "enhancement") and negative reinforcement (e.g., "coping"). Specific findings vary somewhat depending on the study, but negative reinforcement motives for drinking are consistently predicted by high neuroticism and positive reinforcement motives by high extraversion and low conscientiousness. These Five Factor Model traits associated with positive reinforcement reasons for use are suggested by some to be consistent with the disinhibitive personality characteristics that can be predictive of SUDs (e.g., sensation seeking; Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993), and were found by Mezquita et al. to more positively correlate with heavy alcohol consumption than negative reinforcement reasons for use. As has been indicated by empirical study of Cloninger's and Babor et al.'s proposed types, however, research on drinking motives also suggests that disinhibition is not the only pathway to the development of SUDs. Although these Five Factor Model studies likely used predominantly non-disordered users as participants and do not indicate whether those who drink for coping or enhancement reasons are more likely to develop

SUDs, their results nonetheless provide evidence that some individuals are driven to use for reasons quite different from a propensity to engage in unrestrained, stimulus-seeking behavior.

Other researchers have suggested that there are more than two types of individuals with SUDs. On the basis of several clinical factors, Hauser and Rybakowski (1997) identified three clusters of alcoholics ("Type 1," "Type 2," and "Type 3") in an all-male sample of individuals in an inpatient SUD treatment facility. Type 1 alcoholics are similar to Cloninger's (1987) Type 1 and Babor et al.'s (1992) Type A and are characterized by late onset of problematic drinking, low prevalence of alcohol problems in family members, and a mild course. Hauser and Rybakowski's typology differs from the previously discussed dual typologies in that they found that a cluster similar to Cloninger's Type 2 and Babor et al.'s Type B was better explained as being comprised of two unique groups in itself: those with increased prevalence of comorbid psychiatric disorders and those without increased prevalence of comorbid psychiatric disorders. As such, Hauser and Rybakowski's Type 2 alcoholics are characterized by early onset of problematic drinking, high prevalence of alcohol problems in fathers, antisocial personality traits, and severe alcohol-related problems; and their Type 3 alcoholics are characterized by early onset of problematic drinking, severe alcohol-related problems, family history of psychiatric disorders, and high prevalence of psychiatric and somatic diseases. Hill (1992) examined family heritability of alcohol use disorders and also found support for Cloninger's typology, but with the same exception that Cloninger's Type 2 alcoholics may be comprised of two groups; however, the "Type 3" proposed by Hill was

distinguished from Cloninger's Type 2 by a decreased likelihood of antisocial behaviors and antisocial personality characteristics in family members.

Hall et al. (2010) explored subtypes of adolescent users of sedative and anxiolytic drugs and, despite substantial differences in both the samples used and the substances studied, their three class solution ("Class 1," "Class 2," and "Class 3") bore similarities to Hauser and Rybakowski's (1997) typology. Class 1 is comprised of individuals with a lower likelihood of comorbid psychiatric symptoms, fewer lifetime traumatic experiences, more limited substance use histories, less antisocial behavior, and less impulsivity than those in Classes 2 and 3. Individuals in Class 2 were found to evidence higher levels of psychiatric symptoms and increased antisocial behavior as compared to those in Classes 1 and 3. Finally, the adolescents in Class 3 were indicated to demonstrate psychiatric symptoms and behavioral problems that are intermediate as compared to those in Classes 1 and 2.

Windle and Scheidt (2004) collected data on a variety of variables from individuals receiving inpatient treatment for alcohol use disorders and identified four subtypes of users: "mild course," "polydrug," "negative affect," and "chronic/antisocial." According to their findings, mild course users are defined by later onset of problematic drinking, lower levels of alcohol consumption, few childhood behavioral problems, and low family history of alcohol use disorders. Polydrug users are distinct from the other groups because of their increased use of illicit substances in addition to alcohol. Negative affect users are characterized by increased levels of depressive and anxious symptoms, as well as a greater likelihood of characterological symptoms such as manipulativeness or lack of empathy; and chronic/antisocial users are defined by the highest levels of alcohol

consumption and dependence, increased negative social consequences from drinking, the greatest number of years of problematic drinking, and the highest levels of adult antisocial behaviors.

Using data from a nationally representative epidemiological sample, Moss et al. (2007) identified five distinct subtypes of alcohol use disorders: "young adult," "functional," "intermediate familial," "young antisocial," and "chronic severe." They found the young adult subtype to be the most prevalent among those with alcohol use disorders. This group is characterized by a younger age, early onset of an alcohol use disorder, low probability of antisocial personality or other psychological disorders, and a moderate probability of an alcohol use disorder being present in family members. The functional subtype is defined by older respondents, late onset of an alcohol use disorder, low probability of antisocial personality disorder, moderate likelihood of comorbid major depression, and moderate probability of an alcohol use disorder in family members. The intermediate familial subtype is also marked by a relatively older age and relatively late onset of an alcohol use disorder, but shows a modestly elevated likelihood of having antisocial personality disorder, a significantly heightened probability of having a variety of mood and anxiety disorders, an elevated likelihood of comorbid cocaine or cannabis use disorders, and increased probability of an alcohol use disorder in family members. The young antisocial subtype is characterized by a relatively young age, the earliest onset of an alcohol use disorder, the highest probability of antisocial personality disorder, elevated probability of mood and anxiety disorders, the highest likelihood of a variety of comorbid substance use disorders, and elevated probability of multi-generational alcohol use disorders in their family members. The chronic severe subtype is the least prevalent

among those with alcohol use disorders, and is marked by a relatively older age, late onset of an alcohol use disorder, elevated likelihood of antisocial personality disorder, the highest probability of additional mood, anxiety, and other substance use disorders, and the highest likelihood of an alcohol use disorder in family members.

The typologies described in this section represent only a portion of those that have been suggested as a means of delineating the within-group differences observed in both those who use substances and those with substance use disorders. Empirical investigations of the accuracy of the various classification systems that have been proposed have yielded inconsistent findings, leading some to state that there exists little or no consensus among experts regarding the nature, let alone the number, of subtypes of SUDs (Babor & Caetano, 2006). Research has also indicated that constructs typically associated with, or identified as being synonymous with, disinhibition may in fact be heterogeneous themselves (Ersche et al., 2010; Gullo, Ward, Dawe, Powell, & Jackson, 2011; Lynne-Landsman, Graber, Nichols, & Botvin, 2011). Others, however, have suggested that dissimilarity between the various typologies of those who use substances is partly the product of methodological shortcomings and between-study data analysis differences, and that decades of research on the topic have shed light on some themes that are common among the various proposals. Hesselbrock and Hesselbrock (2006), in reviewing the literature on subtypes of alcohol dependence, postulate that four groups of individuals with alcohol use disorders have been identified – although different authors have given these groups different titles – in both genders and across several ethnic groups: a chronic/severe type, a depressed/anxious type, a mildly affected type, and an antisocial type. Delineating the heterogeneity of people who use substances excessively has proven

challenging and much about the classification of problematic substance users remains to be learned, particularly in regard to their personality characteristics. Personality traits related to disinhibition routinely pertain directly to a fragment of any typology, but they are also consistently demonstrated to be only partially explanatory of the SUD population. Developing a better understanding of differences in the personality characteristics of individuals who use substances excessively will likely provide valuable information to those who strive to prevent and treat SUDs.

Emotion and Substance Use

The role of emotion in substance use has long been at the forefront of substance use research and is still widely considered to be central to understanding SUDs (Kassel, 2010). The self-medication hypothesis (Khantzian, 1985) has been a particularly longstanding theoretical explanation for the etiology and maintenance of the use of various substances. It posits that, consciously or unconsciously, individuals both with and without SUDs use drugs and alcohol as a means of alleviating unpleasant emotional states. Despite the intuitive appeal of the theory, studies examining its empirical validity have produced inconsistent findings. Some have found support for self-medication (Colder, 2001; Mason, Hitch, & Spoth, 2009; Swendsen et al., 2000), but such findings often provide only conditional, ambiguous, or otherwise non-confirmatory backing for the theory. Inconsistent with self-medication, other research has suggested that drug and alcohol use may have minimal or no relationship to fluctuations in mood states (Arendt et al., 2007; Flynn, 2000; Hall & Queener, 2007; Hussong, Galloway, & Feagans, 2005; Magid, 2010; Teichman et al., 1989; Tournier, Sorbara, Gindre, Swendsen, & Verdoux, 2003) or may also be likely to occur following positive elevations in mood (Armeli,

Tennen, Affleck, & Kranzler, 2000; Chakroun et al., 2010; Simons, Gaher, Oliver, Bush, & Palmer, 2005; Swendsen et al., 2000).

Nonetheless, some researchers have maintained that the desire to regulate emotion is central to understanding individuals' motivations to use substances (Cooper, 1994; Cox & Klinger, 1988) – but that, divergent from the self-medication hypothesis, people use for positive reinforcement reasons as well as negative reinforcement reasons. Cox and Klinger proposed that when individuals consume alcohol, they do so with pre-existing expectations about affective changes that will be produced by engaging in the behavior. Cooper developed and empirically studied a four factor model of drinking motivations based on the theories of Cox and Klinger. This model characterized drinking motives using two dichotomous dimensions: the source of motivation to drink (internal or external) and the valence of affective results hoped to be attained by drinking (positive reinforcement or negative reinforcement). Crossing these two dimensions yields four motivational classes, each of which reflects a different goal regarding affect regulation: (a) intrinsic, positive reinforcement ("enhancement"), (b) extrinsic, positive reinforcement for social rewards ("social"), (c) intrinsic, negative reinforcement ("coping"), and (d) extrinsic, negative reinforcement to avoid social disapproval ("conformity"). The results of Cooper's large-scale study using a sample of adolescents strongly support this hypothesized model, and subsequent studies on motivational pathways to alcohol consumption – some of which were described in the previous section of this paper – have provided further indication that expectations regarding affect regulation are relevant to substance use and vary among those who use substances (Mezquita et al., 2010; Stewart & Devine, 2000; Stewart et al., 2001; Theakston et al., 2004).

Additional evidence of the considerable role of emotion in SUDs can be found in research on the epidemiology of psychological disorders, as there is extensive, unwavering evidence of the commonality of substance use by individuals with psychopathology and, in particular, mood and anxiety disorders (Burns & Teesson, 2002; Grant et al., 2004; Hasin, Goodwin, Stinson, & Grant, 2005; Kandel et al., 1999; Kessler et al., 1997; Merikangas & Gelernter, 1990; Merikangas et al., 1998; Swendsen et al., 1998; Wolf et al., 1988). Analyzing data from over 43,000 individuals who participated in a national epidemiological study, Grant et al. (2004) found that among those who met criteria for a SUD over the course of 12 months (excluding substance-induced disorders), 19.67% also met criteria for a comorbid mood disorder and 17.71% also met criteria for a comorbid anxiety disorder. Among participants in the study without a SUD, only 8.13% met criteria for a mood disorder and 10.39% met criteria for an anxiety disorder. Some researchers have suggested that mood and/or anxiety disorders temporally precede the initial stages of substance use or, subsequently, SUDs (Kessler et al.; Merikangas et al., 1998; O'Neil, Conner, & Kendall, 2011), but others have indicated that excessive substance use tends to appear before other psychopathology (Fergusson, Boden, & Horwood, 2009; Moore et al., 2007; Putnins, 2006). Regardless of the etiological sequence, the high comorbidity between SUDs and disorders marked by affective dysfunction highlights the importance of emotion in understanding problematic substance use. The exact nature of emotion's role, however, is widely disputed and, as a whole, not well understood.

Emotion-based explanations for substance use have traditionally been viewed as incompatible, or in direct competition (e.g., Chakroun et al., 2010), with theories that

emphasize the role of personality and, in particular, disinhibitive personality traits. However, some (e.g., Wills & Ainette, 2010) suggest that although research on self-control (a construct that is generally synonymous with disinhibition) and SUDs has focused almost exclusively on behavioral self-control, emotional self-control may be just as, if not more, important to the etiology of SUDs despite being largely overlooked as an important factor. Wills, Walker, Mendoza, and Ainette (2006) explored behavioral and emotional self-control in middle and high school students and found that poor behavioral control indirectly predicted substance use via deviant peer relationships, but that poor emotional control (e.g., sadness control, anger control, emotional lability) more strongly predicted substance use via coping motives. A recent study of temperamental characteristics in adolescents with SUDs (Willem et al., 2011) found that those who used substances excessively reported lower levels of positive affectivity and effortful control, as well as higher levels of sad negative affectivity, than members of a matched control group. The authors suggest that their results accentuate the importance of both affective reactive and self-regulatory aspects of temperament in youth who engage in problematic substance use.

Some researchers (Clark & Winters, 2002; Thatcher & Clark, 2010), citing a convergence of evidence from genetic, neurobiological, and psychological research, have proposed that behavioral dysregulation (i.e., behavioral disinhibition), cognitive dysregulation (i.e., cognitive disinhibition), and emotional dysregulation (i.e., emotional disinhibition) combine to form the construct of "psychological dysregulation." Psychological dysregulation is suggested to broadly capture the often-multi-faceted role of poor self-regulation in predicting substance use and to represent a heritable risk factor

for SUDs and a variety of other psychological disorders that are often accompanied by problematic substance use (e.g., conduct disorder, antisocial personality disorder, attention-deficit / hyperactivity disorder, and major depressive disorder). Generally, behavioral dysregulation refers to difficulty controlling behavior when presented with environmental challenges to doing so; cognitive dysregulation involves problems regulating higher-order cognitive functions such as organizing and planning; and emotional dysregulation refers to heightened emotional reactivity, and the presence of symptoms of depression and anxiety. Given that the emotional disinhibition component of psychological dysregulation encompasses tendencies that are generally considered to be consistently present in individuals, it is seemingly best understood as being related to personality. It's relevance to SUDs indicates that in a fashion that is perhaps similar to behavioral disinhibition, emotional disinhibition is central to understanding the relationship between personality and problematic substance use.

Personality Before and During Substance Use

Research attempting to delineate the personality features of substance users often is confounded because it is difficult to determine whether their expressed traits exist independently from or as a consequence of their drug and/or alcohol consumption. There is evidence that individuals who use substances or have SUDs tend to exhibit particular personality traits, but not much is known about the temporal or sequential relationship between substance use and these personality features. Longitudinal research measuring temperament – defined as behavioral and emotional tendencies that appear early in life, remain relatively stable over time, and are predictive of adult personality (Buss & Plomin,

1984) – has provided some indication of the personality features that may be present in individuals prior to substance use.

Cloninger et al. (1988) found that male schoolchildren who were rated by their teachers as being high in novelty seeking and low in harm avoidance at age 11 were nearly 20 times more likely to be diagnosed with an alcohol use disorder at age 27, and that they were more likely than their peers to engage in problematic alcohol use at an earlier age. The results of a study by Masse and Tremblay (1997) indicates that the same personality configuration (high novelty seeking and low harm avoidance) at the ages of 6 and 10 is predictive of alcohol use, cigarette smoking, and other drug use in adolescence. They also found that their participants' scores on those dimensions at age 6 were similarly predictive of adolescent substance use compared to the scores on the same dimensions at age 10. Block, Block, and Keyes (1988) found undercontrol to be a significant factor in predicting drug use at age 14. In analyzing data from the participants of Terman and Oden's (1947) famed longitudinal study, Friedman et al.'s results (1993) indicate that those with low conscientious scores in childhood are more likely to smoke cigarettes, drink alcohol and, ultimately, die at a younger age. Caspi et al. (1997) provide perhaps the most notable evidence of the strength of the relationship between disinhibitive temperament in childhood and adult substance use, however. They found that undercontrolled, as opposed to confident, reserved, or inhibited, 3-year-old children were significantly more likely to have alcohol use disorders and engage in risky behaviors at age 21.

These studies indicate rather convincingly that disinhibitive tendencies, which were measured in predominantly behavioral terms, can arise early and independently of

substance use, and represent considerable risk factors for future consumption of drugs and/or alcohol. Although a thorough literature review reveals that a staggering array of personality characteristics have been shown to relate to substance use with varying degrees of consistency (Littlefield & Sher, 2010), traits related to disinhibition persistently demonstrate the most robust relationship with the consumption of drugs and alcohol. Less is known about other personality characteristics or configurations of personality characteristics that may precede SUDs. Additionally, much remains to be ascertained about changes in expressed personality traits that may occur in the transitional period between non-problematic and problematic substance use in individuals who develop SUDs; or, if they do occur, whether such changes tend to be qualitative or quantitative in nature.

Personality in *DSM-5*

The fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-5*) is presently under development and is intended to be published in May 2013 (see the *DSM-5* website at www.DSM5.org; American Psychiatric Association, 2010). A dramatic reformulation of the personality disorders section has been proposed by the Personality and Personality Disorders Work Group for the *DSM-5* pending further empirical review and critiques from experts in the areas of personality and personality assessment. Previous versions of the manual (e.g., *DSM-IV-TR*) have conceptualized personality disorders as clinical syndromes which are qualitatively distinct from one another and from non-disordered personality. However, as is foreshadowed in the *DSM-IV-TR* (pp. 689-690) and was anticipated well before its publication (e.g., Frances, 1993; Widiger & Simonsen, 2005a), this categorical framework for delineating

personality disorders is likely to shift toward a more dimensionally oriented nosology in *DSM-5*. The dimensional approach posits that rather than being conceptualized as dichotomously present in people with personality disorders or absent in people without personality disorders, personality pathology is better represented as traits which exist on continua in all individuals.

Reasons for the Reformulation

The traditional, categorical approach to personality disorders has been criticized for several reasons. First, due to the specificity and limited flexibility of the diagnostic criteria of each of the ten *DSM-IV-TR* discrete personality disorders, even individuals with overt personality pathology often fail to meet the requirements to be diagnosed with one of them. As such, the residual "personality disorder not otherwise specified" (PDNOS) – a diagnosis which conveys limited information about the individual to whom it is given – is at least among the most prevalent personality disorders assigned by clinicians, and has been indicated by some studies to be the most commonly diagnosed personality disorder (see Verheul & Widiger, 2004 for a meta-analytic review). Further highlighting the difficulty that mental health professionals have in matching those with personality pathology to an appropriate existent diagnosis, clinicians sometimes diagnose individuals with multiple, comorbid personality disorders (e.g., Oldham et al., 1992; Zimmerman, Rothschild, & Chelminski, 2005) or identify them as having "mixed" personality disorders (Verheul & Widiger). A central argument of proponents for a dimensional model of personality pathology in the *DSM-5* is that the use of dimensional profiles of traits rather than categories will greatly increase the manual's capacity to

describe the various manifestations of disordered personality, eliminating the need for generic PDNOS and comorbid personality disorder diagnoses.

Second, despite the fact that, according to the *DSM-IV-TR* (p. 685), personality pathology is expected to be "stable over time," this has been suggested by many to not be the case for discrete personality disorders (e.g., Durbin & Klein, 2006; Grilo et al., 2004; Johnson et al., 2000; Lenzenweger, Johnson, & Willett, 2004; Shea et al., 2002; Zanarini, Frankenburg, Hennen, Reich, & Silk, 2005). Several studies (e.g., Durbin & Klein; Grilo et al.; Shea et al.) have indicated that constellations of maladaptive personality traits are more stable in individuals than categorical diagnoses, and that the regularly observed temporal variation in discrete personality disorder diagnoses can be largely explained by changes in severity or expression of consistently present traits.

Finally, it is now widely, if not unanimously, accepted among experts that the relationship between normal and disordered personality is continuous rather than dichotomous (see, for example, Widiger, Simonsen, Krueger, Livesley, & Verheul, 2005). The nature of the current categorical approach precludes it from sufficiently accounting for several truisms regarding personality pathology: for example, that characteristics of personality disorders are sometimes present in individuals who do not warrant a discrete personality disorder diagnosis, and that there is sometimes substantial heterogeneity within populations of individuals with the same personality disorder diagnosis (American Psychiatric Association, 2010). Although it has long been widely acknowledged that a dimensional approach would provide a more accurate conceptualization of personality pathology, the employment of such a nosology in previous editions of the *DSM* was resisted due to concerns about the clinical utility of doing so (e.g., Trull, 2005; Verheul,

2005) and limited consensus about which of the many proposed dimensional models (Widiger & Simonsen, 2005b) would be most appropriate. These two issues remain central themes in discussions about how to move forward in *DSM-5*. Nonetheless, as is indicated on the *DSM-5* website, the manual's Personality and Personality Disorders Work Group appears poised to begin moving away from categorical diagnoses and implement a model of personality pathology which integrates dimensionality.

Initially Proposed Reformulation

In early 2010, the *DSM-5* Personality and Personality Disorders Work Group proposed a multi-tiered process for assessing personality pathology (see American Psychiatric Association, 2010 for details). Citing a recent study in which general severity of personality pathology was identified as "the most important single predictor of concurrent and prospective dysfunction" (Hopwood et al., in press) and Tyrer's (2005) assertion that severity level must be part of any dimensional model, clinicians were asked to rate on a five point scale an individual's overall level of "self and interpersonal functioning." Additionally, the work group proposed that clinicians assess on a four point scale 6 broad, higher order personality trait domains and 37 more specific, lower order trait facets; and, dissimilarly from previous versions of the manual, that an assessment of the presence of these domains and facets be considered regardless of whether an evaluated individual is believed to meet criteria for a personality disorder. See Table 1 for the American Psychiatric Association's (2010) initially proposed trait domains and facets and adaptations of their descriptions.

Table 1. *Initially Proposed DSM-5 Trait Domains and Facets*

Trait Domain/*Facet*	Description
Negative Emotionality	Experiences a range of negative emotions, such as anxiety depression, guilt/shame, and worry, as well as behavioral and interpersonal indications of those experiences.
Emotional Lability	Having emotional experiences characterized by frequent, large mood changes; having emotions that are quickly aroused, intense, and/or excessive in relation to events and circumstances.
Anxiousness	Having regular, persistent, and intense feelings of nervousness or edginess; worry and nervousness about the adverse effects of past unpleasant experiences and future negative possibilities; feeling frightened and threatened by uncertainty.
Submissiveness	Subservience and lack of assertiveness; reassurance seeking; low confidence in decision-making; subordination of one's needs to the needs of others; adaptation of one's behavior to the wants of others.
Separation Insecurity	Worry about rejection by, and/or separation from, significant others; feeling distress when significant others are not present or available on short notice; active avoidance of separation from significant others, even at a cost to other aspects of functioning.
Pessimism	Having a negative view of life; focusing on and accentuating negative aspects of current and past experiences or circumstances; expecting negative outcomes.
Low Self-Esteem	Having a poor opinion of one's self; believing that one lacks worth; disliking or being dissatisfied with oneself; believing that one is incapable of doing things or is incapable of doing them well.
Guilt/Shame	Having regular and persistent feelings of guilt/shame/blameworthiness, even over unimportant matters; frequently believing that one is deserving of punishment for wrongdoing.
Self-Harm	Engaging in thoughts and/or behaviors related to self-harm (e.g., intentional cutting) and suicide, including suicidal ideation, threats, gestures, and attempts.

Table 1 (continued). *Initially Proposed DSM-5 Trait Domains and Facets*

Trait Domain/*Facet*	Description
Depressivity	Having regular feelings of being sad/depressed/hopeless; difficulty "bouncing back" from such moods; thoughts that one is a sad/depressed person.
Suspiciousness	Lack of trust in others; expectations of and hyperalertness to signs of others' ill-intent or harm; doubting others' loyalty and fidelity; ideas of persecution.
Introversion	Withdrawal from others, ranging from close relationships to the world at large; restricted emotional experience and expression; limited capacity for pleasure.
Social Withdrawal	Preference for being alone rather than being with others; shyness in social situations; avoidance of social contacts and social activity; rarely, if ever, initiates social contact.
Social Detachment	Disinterest in local and worldly events; lack of interest in social contacts and activity; distance from others; having only non-intimate relations and being curt with others (e.g., solely goal- or task-related interactions).
Restricted Affectivity	Lack of affective experience and display; emotional reactions, when evident, lack depth and are transitory; unemotional, even in situations that would arouse emotion for most others.
Anhedonia	Lack of pleasure from, engagement in, or energy for life experiences; deficit in the capacity to feel enjoyment or have interest in things.
Intimacy Avoidance	Lack of interest in, and avoidance of, intimate relationships, interpersonal attachments, and sexual/romantic relationships.
Antagonism	Exhibits various manifestations of antipathy toward other people, and a correspondingly excessive sense of self-importance.
Callousness	Lack of empathy or care about others' feelings or problems; lack of remorse about the negative or harmful effects of one's actions on other people; tendency to exploit others.
Manipulativeness	Use of cunning, craft, or deception to influence or exercise control over others; casual use of other people to one's own advantage; use of charm or glibness to achieve one's goals.

Table 1 (continued). *Initially Proposed DSM-5 Trait Domains and Facets*

Trait Domain/*Facet*	Description
Narcissism	Boastfulness or exaggeration of one's accomplishments and abilities; self-centeredness; feeling and acting entitled, firmly holding the belief that one is superior to others and deserves only the best.
Histrionism	Behaving in such a way that makes one the focus of others' attention; desiring of admiration; flamboyance; inappropriate sexualization of close relationships.
Hostility	Irritability, having a quick temper; being unfriendly/rude/gruff/nasty; responding with anger to mild slights or insults.
Aggression	Being mean, cruel, or cold-hearted; verbally, relationally, or physically abusive; willingly and willfully engaging in behaviors that humiliate and demean others, and in acts of violence against persons and objects; belligerence/vengefulness; use of dominance and intimidation to exercise control over others.
Oppositionality	Refusing to cooperate with requests, meet obligations, and complete tasks as displays of defiance; resentment of and behavioral resistance to reasonable expectations regarding one's performance; behaving in such a way that undermines persons of authority.
Deceitfulness	Dishonesty; embellishment or fabrication when relating events; false representation of self.
Disinhibition	Diverse manifestations of being present-oriented, rather than future- or past-oriented, so that behavior is driven by current internal and external stimuli more so than past learning and weighing of future consequences.
Impulsivity	Behaving on the spur of the moment in response to immediate stimuli; behaving on a momentary basis without a plan or consideration of possible outcomes; struggles to establish and follow plans; failure to learn from experience.
Distractibility	Having a hard time focusing on tasks (e.g., attention easily diverted by extraneous stimuli); difficulty maintaining behavior that is goal-focused, including in conversations with others.

Table 1 (continued). *Initially Proposed DSM-5 Trait Domains and Facets*

Trait Domain/*Facet*	Description
Recklessness	Engaging in risky and potentially dangerous activities/behaviors unnecessarily and without regard for consequences; proneness to boredom and unplanned initiation of activities to counter boredom; lack of concern for one's limitations; denial of the reality of danger to oneself; high tolerance for uncertainty.
Irresponsibility	Lack of regard for, or failure to honor, financial and other obligations or commitments to others; lack of follow through on promises; low reliability; difficulty keeping appointments or completing tasks or assignments; carelessness with own or others' possessions.
Compulsivity	The tendency to think and behave according to narrowly defined and unchanging ideals, and the belief that these ideals should be adhered to by everyone.
Perfectionism	Insistence on flawlessness, without errors or faults, including the performance of oneself and others; belief that reality should conform to one's own vision; holding oneself and others to excessively high standards; sacrificing timeliness to guarantee correctness in every detail.
Perseveration	Persistence at tasks long after behavior has stopped being functional or effective; belief that any lack of success is due to lack of effort or ability; repetition of the same behavior despite repeated failures.
Rigidity	Being governed by rules and habits; belief that there is only one correct way to do things; insistence on an unchanging routine; difficulty altering behaviors to changing circumstances; processing of information on the basis of fixed beliefs and expectations; difficulty changing ideas and/or perspectives, even in the face of overwhelming contrary evidence.
Orderliness	Extreme need for order and structure; insistence on everything having a correct place; low tolerance for things being "out of place"; excessive concern with details, lists, arrangements, schedules, etc.

Table 1 (continued). *Initially Proposed DSM-5 Trait Domains and Facets*

Trait Domain/*Facet*	Description
Risk Aversion	Lack of risk-taking; unwillingness to consider taking even minor risks; avoidance of activities that have even miniscule potential to cause injury or harm to oneself; strict adherence to behaviors which minimize health-related and other risks.
Schizotypy	Exhibits odd or unusual behaviors and cognitions, including both process (e.g., perception) and content (e.g., thoughts).
Unusual Perceptions	Having odd sensory experiences in various modalities; experiencing synesthesia (cross-modal perception); interpreting or perceiving events and other things in ways that others do not.
Unusual Beliefs	Content of thoughts that is viewed by others of the same culture and society as peculiar; idiosyncratic but deeply held convictions that are not supported by objective evidence; possessing unusual views of reality.
Eccentricity	Peculiar behavior (e.g., odd mannerisms; wearing clothing that is overtly inappropriate to the occasion or season); saying unusual or contextually-inappropriate things; frequent use of neologisms; concrete and impoverished speech; viewed by others of the same culture and society as odd.
Cognitive Dysregulation	Bizarre thought processes; having illogical thoughts and ideas; derailment of one's train of thought; demonstrating loose associations or making non-sequiturs; disorganized and/or confused thought, especially when under stress.
Dissociation Proneness	Tendency to experience disruptions in the flow of consciousness; "losing time," (e.g., being unaware of how one got to one's current location); experiencing one's surroundings as unreal.

Four of these six trait domains – negative emotionality, introversion, antagonism, and disinhibition – were recommended by the Personality and Personality Disorders Work Group due to their correspondence with the Five Factor Model (Costa & McCrae, 1985) trait domains of neuroticism, extraversion, agreeableness, and conscientiousness, respectively. Meta-analyses have indicated that these four trait domains of the Five

Factor Model, but not the fifth domain of openness, are strongly related to *DSM-IV* (American Psychiatric Association, 1994) personality disorder diagnoses (O'Connor, 2005; Saulsman & Page, 2004). The inclusion of compulsivity and schizotypy in the proposed *DSM-5* trait domains is suggested to stem from Saulsman and Page's finding that obsessive-compulsive personality disorder and schizotypal personality disorder are not well-covered by the Five Factor Model; and from Tackett et al. (2008) and Watson, Clark, and Chmielewski's (2008) indication that schizotypy forms a sixth factor of both normal and abnormal personality. The work group proposed the 37 more specific, lower order trait facets "based on existing measures of normal and abnormal personality, as well as recommendations by experts in personality assessment" (American Psychiatric Association, 2010).

Rather than fully abandoning the categorical approach to personality disorders, five personality "types" were recommended for retention in the *DSM-5* (borderline, antisocial/psychopathic, schizotypal, avoidant, and obsessive-compulsive), each with their own corresponding constellation of proposed trait facets. Additionally, the Personality and Personality Disorders Work Group recommended a revised general definition of personality disorder, one which centered on "adaptive failure" in terms of development of "a sense of self-identity" and/or "the capacity of interpersonal functioning" (see American Psychiatric Association, 2010 for details). The work group noted that all aspects of the proposed model – including the methods by which the appropriateness of a personality disorder diagnosis would be determined – were preliminary pending empirical validation in field trials and further discussion amongst its members.

Critiques of the Initially Proposed Reformulation

In the months following the introduction of the initially proposed reformulation, mental health professionals and personality and personality assessment experts were invited to empirically and intuitively review the proposed material and provide the Personality and Personality Disorders Work Group with feedback. A variety of criticisms were leveled against the proposal (Pilkonis, Hallquist, Morse, & Stepp, 2011; Widiger, 2011a, 2011b; Zimmerman, 2011) – many of which have continued to be forcefully expressed following the unveiling of the revised proposal in June 2011. Widiger (2011a) argued that although the initially proposed model integrated dimensionality, its framework did not accurately reflect the body of research that has accumulated on the dimensional nature of personality traits. He cited the inclusion of only uni-dimensional traits and the lack of bipolar traits, as well as the absence of any reference to the continuity between normal and pathological traits, as evidence of inconsistency between the suggested reformulation and previous empirical findings.

Widiger (2011a; 2011b) also posited that the "cumbersome" multi-step nature of the proposed model would result in reduced clinical utility and difficulties in conveying diagnostic information to others (e.g., health insurance companies); that several highly relevant pathological personality characteristics (e.g., glib charm, fearlessness, attention-seeking, sensation seeking, and alexithymia) were left out of the proposed list of trait facets; that some of the trait facets included in the proposal (i.e., narcissism and histrionism) were too heterogeneous of constructs to rate uni-dimensionally; and that the exclusion of half of the *DSM-IV-TR* personality disorder diagnoses (paranoid, schizoid, histrionic, narcissistic, and dependent personality disorders) from the list of types was

empirically unjustifiable. A number of other researchers expressed particular concern over the omission of a narcissistic type (Pincus, 2011; Ronningstam, 2011). Zimmerman (2011) questioned whether the three primary issues cited as reasons to dismantle the *DSM-IV-TR* nosology for personality disorders – high comorbidity, diagnostic instability, and inaccuracy of categories – are truly as problematic as indicated by the *DSM-5* Personality and Personality Disorders Work Group (American Psychiatric Association, 2010). Broadly, the initially proposed changes provoked widespread acknowledgement in the field that they were, as advertised, "major" (e.g., Skodol et al., 2011), and, not surprisingly, there has been substantial debate among experts as to how they would be most appropriately implemented.

Revision of the Proposed Reformulation

In June 2011, the *DSM-5* Personality and Personality Disorders Work Group introduced several changes to their reformulation, noting that "all parts of the model [were] simplified and streamlined" in response to comments and critiques regarding the initial proposal (see American Psychiatric Association, 2011 for details). Narcissistic personality disorder was included as a sixth specific personality disorder type, joining the previously included antisocial, avoidant, borderline, obsessive-compulsive, and schizotypal personality disorders; and, unlike in the initial proposal, but similar to *DSM-IV-TR*, diagnostic criteria were proposed for each of these types. Diagnostic criteria were also proposed for "personality disorder trait specified," which is to be diagnosed when an individual demonstrates significant impairments in both self functioning as reflected by dimensions of identity and self-directedness and interpersonal functioning as reflected by impairments in capacities for empathy and intimacy (Bender, Morey, &

Skodol, 2011), but exhibits personality pathology which is better explained by a configuration of traits that does not conform to the proposed diagnostic criteria of one of the six aforementioned personality disorder types. This overall model is described as "hybrid" by the work group, in that it incorporates dimensional and categorical models of personality disorders; but it is noted that it is the personality disorder trait specified diagnosis, rather than the six personality disorder types, which implements the newer, dimensional nosology in its full form.

The work group proposed a set of trait domains and facets to describe personality pathology that is similar to those of the initial proposal, but with some alterations. Decreasing the amount of content for clinicians to consider when evaluating clients, the total number of trait domains was reduced from six to five and the total number of trait facets was reduced from 37 to 25. The trait domains of negative emotionality, introversion, and schizotypy were renamed "negative affectivity," "detachment," and "psychoticism," respectively; and the titles of the domains of antagonism and disinhibition remained the same. The trait domain of compulsivity was removed from the revised proposal, although the work group suggested that the bipolar opposite of a trait facet included in the disinhibition domain – "(lack of) rigid perfectionism" – could be used to measure the construct. Three trait facets (depressivity, suspiciousness, and hostility) were included in multiple trait domains, and restricted affectivity was included in the trait domain of detachment while it's bipolar opposite trait facet – "(lack of) restricted affectivity" – was included in the trait domain of negative affectivity. The trait facets of narcissism and histrionism were changed to "grandiosity" and "attention seeking," respectively, and these new descriptors were suggested to cover the core

features of *DSM-IV-TR* narcissistic and histrionic personality disorders. Altogether, the trait domains and facets in the revised proposal represented a consolidated version of the earlier reformulation, as content was primarily removed from, rather than added to, the initial proposal. See Table 2 for the American Psychiatric Association's (2011) revised proposed trait domains and facets and adaptations of their descriptions.

Table 2. *Revised Version of Proposed DSM-5 Trait Domains and Facets*

Trait Domain/*Facet*	Description
Negative Affectivity	Involves experiencing negative affect intensely and with regularity.
Emotional Lability	Unstable affective experiences and frequent mood shifts; emotions that are quickly aroused, intense, and/or excessive in relation to events and circumstances.
Anxiousness	Intense feelings of nervousness, edginess, or panic in reaction to various situations; worry about the adverse effects of past unpleasant experiences and future negative possibilities; feeling apprehensive, frightened, or threatened by uncertainty; fears of embarrassment or "losing it."
Separation Insecurity	Worry about rejection by, and/or separation from, significant others, associated with concerns about excessive dependence on others and loss of autonomy.
Perseveration	Persistence at tasks long after behavior has stopped being functional or effective; repetition of the same behavior despite repeated failures.
Submissiveness	Adaptation of one's behavior to the wants of others.
Hostility	Persistent or regularly-experienced angry feelings; responding angrily or irritably to mild slights or insults; Gruff, nasty, or vindictive behavior.
Depressivity	Regular feelings of being sad, depressed, and/or hopeless; difficulty "bouncing back" from such moods; pessimism regarding the future; pervasive feelings of shame; low self worth; suicidality.

Table 2 (continued). *Revised Version of Proposed DSM-5 Trait Domains and Facets*

Trait Domain/*Facet*	Description
Suspiciousness	Expectations of, and heightened altertness to, signs of others' ill-intent or harm; doubting others' loyalty and fidelity; ideas of persecution.
(lack of) Restricted affectivity	Limited reaction to situations which would arouse emotion in most others; constricted affective experience and expression.
Detachment	Involves withdrawal from others and from interactions with others.
Restricted Affectivity	Limited reaction to situations which would arouse emotion in most others; constricted affective experience and expression.
Depressivity	Regular feelings of being sad, depressed, and/or hopeless; difficulty "bouncing back" from such moods; pessimism regarding the future; pervasive feelings of shame; low self worth; suicidality.
Suspiciousness	Expectations of, and heightened altertness to, signs of others' ill-intent or harm; doubting others' loyalty and fidelity; ideas of persecution.
Withdrawal	Preference for being alone rather than being with others; shyness in social situations; avoidance of social contacts and social activity; rarely, if ever, initiates social contact.
Anhedonia	Lack of pleasure from, engagement in, or energy for life experiences; deficits in the capacity to feel enjoyment or have interest in things.
Intimacy Avoidance	Avoidance of intimate relationships, interpersonal attachments, and sexual/romantic relationships.
Antagonism	Involves behaviors that result in the individual being in conflict with others.
Manipulativeness	Frequent use of deception to influence or exercise control over others; use of charm, or glibness to achieve one's goals.
Deceitfulness	Dishonesty; false representation of self; embellishment or fabrication when relating events.

Table 2 (continued). *Revised Version of Proposed DSM-5 Trait Domains and Facets*

Trait Domain/*Facet*	Description
Grandiosity	Feeling entitled, either overtly or covertly; self-centeredness; firmly holding to the belief that one is superior to others.
Attention Seeking	Excessive attempts to make one the focus of others' attention; desiring of admiration.
Callousness	Lack of concern about others' feelings or problems; lack of remorse about the negative or harmful effects of one's actions on other people; aggression or malevolence toward others.
Hostility	Persistent or regularly-experienced angry feelings; responding angrily or irritably to mild slights or insults; Gruff, nasty, or vindictive behavior.
Disinhibition	Involves behaving without reflecting on potential future consequences or such behavior. Compulsivity is the inverse of this domain.
Irresponsibility	Lack of regard for, or failure to honor, financial and other obligations or commitments to others; lack of follow through on promises.
Impulsivity	Behaving on the spur of the moment in response to immediate stimuli; behaving on a momentary basis without a plan or consideration of possible outcomes; struggles to establish and follow plans; a sense of urgency and self-destructive behavior when under emotional distress.
Distractibility	Having a hard time focusing on tasks; attention is easily diverted by extraneous stimuli; difficulty maintaining behavior that is goal-focused.
Risk Taking	Unnecessary engagement in activities which are potentially self-damaging without regard for consequences; proneness to boredom and unplanned initiation of activities to counter boredom; lack of concern for one's limitations and denial of the reality of danger to oneself.
(lack of) Rigid Perfectionism	Insistence on flawlessness, without errors or faults, including the performance of oneself and others; sacrificing timeliness to guarantee correctness in every detail; believing that there is only one correct way to do things; difficulty altering ideas and/or perspectives; excessive concern with details, arrangements, and order.

Table 2 (continued). *Revised Version of Proposed DSM-5 Trait Domains and Facets*

Psychoticism	Involves having odd or unusual experiences.
Unusual Beliefs and Experiences	Thought content that is viewed by others as peculiar or idiosyncratic; odd experiences of reality.
Eccentricity	Peculiar behavior or appearance; saying unusual or contextually-inappropriate things.
Cognitive and Perceptual Dysregulation	Bizarre thought processes; circumstantial, vague, and/or over-elaborate thought or speech; odd sensory experiences in various modalities.

The work group recommended that clinicians rate the proposed traits in one of three ways, depending on the relevance of personality to the individual being evaluated. The clinician may rate any of the following on a four point scale (*0 – very little or not at all descriptive, 1 – mildly descriptive, 2 – moderately descriptive, 3 – extremely descriptive*): (a) just the five trait domains, (b) all of the trait facets, or (c) the five trait domains followed by the trait facets comprising the domains which were rated as being moderately or extremely descriptive of the individual.

The Present Study

The primary purpose of this study was to examine, in a residential SUD treatment sample, the relationship between proposed *DSM-5* personality traits and SUDs. Along with colleagues, the author of the present study developed a survey – the Brief Assessment of Traits - 37 (BAT37; Young & Mayer, 2010) – to measure the presence and severity of the initially proposed *DSM-5* trait facets (American Psychiatric Association, 2010) in individuals. On the survey, each of the 37 initially proposed *DSM-5* facets is represented by a cluster of three statements (e.g., *Emotional Lability* is represented by "is emotionally intense," "gets upset very easily," and "has big mood swings"). The three

representative statements were derived from the American Psychiatric Association (2010) descriptions of the traits (see Table 1), were examined by subject-matter experts to scrutinize their content validity, and were reviewed by laypeople to ensure their comprehensibility. The instructions on the BAT37 direct subjects to rate on an anchored, four-point scale the degree to which each of the 37 clusters of items describe themselves. The four anchors on the scale are: *0 – does not describe me at all*, *1 – mildly describes me*, *2 – moderately describes me*, and *3 – describes me extremely well.*

A two-stage, self-report version of the BAT37 was utilized to explore whether and which maladaptive traits precede substance use, whether and which particular traits are present following the onset of SUDs, and whether and what kind of changes in expressed personality traits occur in the transitional period between non-problematic and problematic substance use. More broadly, whether the patterns of relationships between personality pathology and substance use are largely idiosyncratic or consistent across subjects was also investigated. Additionally, the construct validity of the BAT37 traits was examined by comparing the BAT37 self-report results with theoretically related scales from the Dimensional Assessment of Personality Pathology – Basic Questionnaire (DAPP-BQ; Livesley & Jackson, 2009), the HEXACO Personality Inventory – Revised (HEXACO-PI-R; Ashton & Lee, 2009; Lee & Ashton, 2004), and the Personality Assessment Inventory (PAI; Morey, 1991, 1996, 2007).

Hypothesis Set One: BAT37 Construct Validity as Compared to the DAPP-BQ, HEXACO-PI-R, and PAI

The PAI, DAPP-BQ, and HEXACO-PI-R scales which were expected to be strongly correlated with specific, theoretically-related BAT37 traits can be found in Table 3.

Table 3. *Hypothesized Strong Correlations Between BAT37 Traits and PAI, DAPP-BQ, and HEXACO-PI-R Scales*

BAT37 Trait	PAI	DAPP-BQ	HEXACO-PI-R
Emotional Lability	• *Affective Instability (BOR-A)*	• *Affective instability*	
Anxiousness	• *Anxiety (ANX)* • *Anxiety-Cognitive (ANX-C)* • Anxiety-Affective (*ANX-A*) • Anxiety-Physiological (*ANX-P*)	• *Anxiety*	• *Anxiety* • (-) *Social Self-Esteem*
Submissiveness		• *Submissiveness*	• (-) *Social Boldness*
Separation Insecurity		• *Insecure attachment*	
Pessimism	• *Depression-Cognitive (DEP-C)*		
Low Self-Esteem			• (-) *Social Self-Esteem*

Table 3 (continued). *Hypothesized Strong Correlations Between BAT37 Traits and PAI, DAPP-BQ, and HEXACO-PI-R Scales*

BAT37 Trait	PAI	DAPP-BQ	HEXACO-PI-R
Guilt/Shame	• *Depression-Cognitive (DEP-C)*		
Self-Harm	• *Suicidal Ideation (SUI)*		
Depressivity	• *Depression (DEP)* • *Depression-Cognitive (DEP-C)* • *Depression-Affective (DEP-A)* • *Depression-Physiological (DEP-P)*		• (-) *Liveliness*
Suspiciousness	• *Paranoia (PAR)*	• *Suspiciousness*	
Social Withdrawal	• *Social Detachment (SCZ-S)*	• *Low Affiliation*	• (-) *Extraversion* • (-) *Social Boldness* • (-) *Sociability*
Social Detachment	• *Social Detachment (SCZ-S)*	• *Low Affiliation*	• (-) *Extraversion* • (-) *Sociability*
Intimacy Avoidance		• *Intimacy Problems*	• (-) *Dependence* • (-) *Extraversion*
Restricted Affectivity		• *Restricted Expression*	• (-) *Liveliness*
Anhedonia			• (-) *Liveliness*

Table 3 (continued). *Hypothesized Strong Correlations Between BAT37 Traits and PAI, DAPP-BQ, and HEXACO-PI-R Scales*

BAT37 Trait	PAI	DAPP-BQ	HEXACO-PI-R
Callousness	• *Egocentricity (ANT-E)*	• *Callousness*	• (-) *Sentimentality* • (-) *Agreeableness* • (-) *Forgiveness* • (-) *Altruism*
Manipulativeness	• *Egocentricity (ANT-E)*		• (-) *Honesty-Humility* • (-) *Sincerity* • (-) *Fairness*
Narcissism	• *Egocentricity (MAN-G)*	• *Narcissism*	• (-) *Modesty*
Histrionism		• *Narcissism*	• (-) *Greed Avoidance* • (-) *Modesty*
Hostility	• *Irritability (MAN-I)*	• *Rejection*	• (-) *Agreeableness* • (-) *Forgiveness* • (-) *Gentleness* • (-) *Patience*
Aggression	• *Aggression (AGG)* • *Aggressive Attitude (AGG-A)* • *Verbal Aggression (AGG-V)* • *Physical Aggression (AGG-P)*		• (-) *Agreeableness* • (-) *Gentleness*
Oppositionality		• *Oppositionality* • *Rejection*	• (-) *Agreeableness*

Table 3 (continued). *Hypothesized Strong Correlations Between BAT37 Traits and PAI, DAPP-BQ, and HEXACO-PI-R Scales*

BAT37 Trait	PAI	DAPP-BQ	HEXACO-PI-R
Deceitfulness			• (-) *Honesty-Humility* • (-) *Sincerity* • (-) *Fairness*
Impulsivity	• *Self-Harm (BOR-S)*	• *Stimulus Seeking*	• (-) *Conscientiousness* • (-) *Prudence*
Distractibility	• *Thought Disorder (SCZ-T)*	• *Oppositionality*	• (-) *Conscientiousness*
Recklessness	• *Activity Level (MAN-A)* • *Self-Harm (BOR-S)* • *Stimulus-Seeking (ANT-S)*	• *Stimulus Seeking* • *Conduct Problems*	• (-) *Conscientiousness* • (-) *Prudence*
Irresponsibility	• *Antisocial Behaviors (ANT-A)*	• *Conduct Problems* • *Oppositionality*	• (-) *Conscientiousness* • (-) *Diligence*
Perfectionism	• *Obsessive-Compulsive (ARD-O)*	• *Compulsivity*	• *Conscientiousness* • *Organization* • *Perfectionism*
Perseveration			• (-) *Flexibility*
Rigidity	• *Obsessive-Compulsive (ARD-O)*		• (-) *Flexibility*
Orderliness	• *Obsessive-Compulsive (ARD-O)*	• *Compulsivity*	• *Conscientiousness* • *Organization* • *Perfectionism*

Table 3 (continued). *Hypothesized Strong Correlations Between BAT37 Traits and PAI, DAPP-BQ, and HEXACO-PI-R Scales*

BAT37 Trait	PAI	DAPP-BQ	HEXACO-PI-R
Risk Aversion	• (-) *Stimulus-Seeking (ANT-S)*	• (-) *Stimulus Seeking*	
Unusual Perceptions	• *Psychotic Experiences* (SCZ-P)		
Unusual Beliefs	• *Psychotic Experiences (SCZ-P)*		
Eccentricity			• *Unconventionality*
Cognitive Dysregulation	• *Thought Disorder (SCZ-T)*	• *Cognitive Dysregulation* • *Oppositionality*	
Dissociation Proneness		• *Cognitive Dysregulation*	

Note. PAI, DAPP-BQ, and HEXACO-PI-R scales that are preceded by a minus sign (-) were hypothesized to be negatively correlated with the corresponding BAT37 trait.

Hypothesis Set Two: Maladaptive Personality Traits Which Precede Substance Use

It was hypothesized that BAT37 items conceptually related to disinhibition in general (which, in this context, was considered synonymous with the aforementioned broad construct of psychological dysregulation; Clark & Winters, 2002; Thatcher & Clark, 2010) – including behavioral, cognitive, and emotional components – would be identified by self-reports as precursors to SUDs which were present in subjects before the initiation of regular substance use. Specifically, the following initially proposed *DSM-5* trait facets (with their corresponding proposed trait domain in parentheses), as measured by the BAT37, were expected to be commonly indicated to have preceded subjects'

regular substance use: *Emotional Lability* (negative emotionality), *Anxiousness* (negative emotionality), *Self-Harm* (negative emotionality), *Depressivity* (negative emotionality), *Hostility* (antagonism), *Aggression* (antagonism), *Impulsivity* (disinhibition), *Distractibility* (disinhibition), *Recklessness* (disinhibition), and/or *Irresponsibility* (disinhibition). Given their inverse relationship to disinhibition, the trait facets comprising the initially proposed *DSM-5* trait domains of introversion and compulsivity were anticipated to be rarely indicated to have preceded problematic substance use in subjects. Due to the demographics of the sample being studied (clients, many of whom are professionals with advanced degrees, at a private SUD residential treatment facility), traits encompassed by the schizotypy domain were also expected to be rarely indicated as precursors to regular substance use.

Hypothesis Set Three: Personality-Based Typologies of Individuals With SUDs

Given the extensive and diverse evidence of heterogeneity among those with SUDs (Babor & Caetano, 2006; Babor et al., 1992; Cadoret, Troughton, & Widmer, 1984; Cloninger, 1987; Moss, Chen, & Yi, 2007; Scourfield, Stevens, & Merikangas, 1996), individual differences were expected to be more pronounced than group differences in attempting to classify individuals with SUDs. It was speculated that beyond disinhibitive traits, additional maladaptive personality characteristics in subjects would be indicated to be largely idiosyncratic.

Hypothesis Set Four: Changes in Traits Between Non-Problematic Use and SUDs

Given the lack of empirical research pertaining to changes in expressed personality traits in the transitional period between non-problematic and problematic use in individuals who develop SUDs, this set of hypotheses was largely speculative.

Following de Wit's (2009) suggestion that impulsivity likely both predicts substance use and increases in response to continued use, along with the findings of Littlefield et al. (2009), it was anticipated that the aforementioned *DSM-5* trait facets conceptually related to disinhibition (see Hypothesis Set Two) will be indicated to be present prior to substance use and quantitatively stronger following the onset of SUDs. Furthermore, it was theorized that – perhaps due to factors indirectly affected by substance use (e.g., social, legal, and/or financial problems) – a variety of additional *DSM-5* trait facets which are not related to disinhibition would be indicated to have developed in subjects following the onset of SUDs. Thus, examination of temporal changes in subjects' traits was hypothesized to evidence both quantitative and qualitative transformations in personality as a result of excessive substance use.

CHAPTER TWO
PILOT STUDY

Before administering the BAT37 in the residential SUD treatment sample, a preliminary study was conducted to empirically examine the appropriateness of the structure of the forms for measuring the proposed *DSM-5* trait facets. Specifically, the investigator sought to determine whether it was empirically justifiable to assess the initially proposed *DSM-5* traits using 37 clusters of three statements rather than 111 individual items, with each item represented by one of the statements used in the clusters. Surveys were administered to 164 undergraduate students as an extra credit opportunity in their respective psychology classes. Each participating student completed two forms: one on which a rating was provided for each of the 37 clusters and another on which a rating was provided for each of the 111 statements that comprise the clusters (see Appendix A for the survey forms used in the pilot study). The sequence in which the participants filled out the two forms was alternated for every other student. Students were seated at a maximum feasible distance from one another while completing the forms so as to increase their sense of anonymity.

Pilot study data analyses revealed moderate to strong Spearman correlation coefficients, ranging from $r_s = .454$ to $r_s = .861$, between cluster scores and the averages of the combined corresponding item scores for each trait facet (see Table 4). Similarly, Spearman correlation coefficients between each individual item and its corresponding cluster score ranged from low-moderate, $r_s = .338$, to strong, $r_s = .830$ (see Table 5). The

Spearman correlation coefficient between participants' overall cluster means and overall item means was also strong, $r_s = .878$ (see Table 6). Wilcoxon signed ranks tests were performed to examine mean differences between cluster scores and the averages of the combined corresponding item scores, and for the majority of the trait facets (27 of 37) any differences were found to be non-significant (see Table 7). Additionally, a Wilcoxon signed ranks test revealed no significant difference between the overall cluster mean and overall item mean (see Table 8). Descriptive statistics of the items and clusters examined in the pilot study can be found in Table 9.

Table 4. *Pilot Study Correlations Between Cluster Scores and Averages of Combined Corresponding Items for BAT37 Traits*

BAT37 Trait: Cluster / Items	Spearman's rho (r_s)
Emotional Lability: Cluster 1 / Items 1, 38, 75	.692
Anxiousness: Cluster 2 / Items 2, 39, 76	.787
Submissiveness: Cluster 3 / Items 3, 40, 77	.692
Separation Insecurity: Cluster 4 / Items 4, 41, 78	.668
Pessimism: Cluster 5 / Items 5, 42, 79	.798
Low Self-Esteem: Cluster 6 / Items 6, 43, 80	.699
Guilt/Shame: Cluster 7 / Items 7, 44, 81	.758
Self-Harm: Cluster 8 / Items 8, 45, 82	.741
Depressivity: Cluster 9 / Items 9, 46, 83	.634
Suspiciousness: Cluster 10 / Items 10, 47, 84	.695
Social Withdrawal: Cluster 11 / Items 11, 48, 85	.778
Social Detachment: Cluster 12 / Items 12, 49, 86	.653
Intimacy Avoidance: Cluster 13 / Items 13, 50, 87	.734

Table 4 (continued). *Pilot Study Correlations Between Cluster Scores and Averages of Combined Corresponding Items for BAT37 Traits*

BAT37 Trait: Cluster / Items	Spearman's rho (r_s)
Restricted Affectivity: Cluster 14 / Items 14, 51, 88	.779
Anhedonia: Cluster 15 / Items 15, 52, 89	.454
Callousness: Cluster 16 / Items 16, 53, 90	.609
Manipulativeness: Cluster 17 / Items 17, 54, 91	.753
Narcissism: Cluster 18 / Items 18, 55, 92	.651
Histrionism: Cluster 19 / Items 19, 56, 93	.806
Hostility: Cluster 20 / Items 20, 57, 94	.833
Aggression: Cluster 21 / Items 21, 58, 95	.815
Oppositionality: Cluster 22 / Items 22, 59, 96	.688
Deceitfulness: Cluster 23 / Items 23, 60, 97	.759
Impulsivity: Cluster 24 / Items 24, 61, 98	.731
Distractibility: Cluster 25 / Items 25, 62, 99	.852
Recklessness: Cluster 26 / Items 26, 63, 100	.786
Irresponsibility: Cluster 27 / Items 27, 64, 101	.646
Perfectionism: Cluster 28 / Items 28, 65, 102	.728
Perseveration: Cluster 29 / Items 29, 66, 103	.766
Rigidity: Cluster 30 / Items 30, 67, 104	.731
Orderliness: Cluster 31 / Items 31, 68, 105	.861
Risk Aversion: Cluster 32 / Items 32, 69, 106	.555
Unusual Perceptions: Cluster 33 / Items 33, 70, 107	.717
Unusual Beliefs: Cluster 34 / Items 34, 71, 108	.738
Eccentricity: Cluster 35 / Items 35, 72, 109	.764

Table 4 (continued). *Pilot Study Correlations Between Cluster Scores and Averages of Combined Corresponding Items for BAT37 Traits*

BAT37 Trait: Cluster / Items	Spearman's rho (r_s)
Cognitive Dysregulation: Cluster 36 / Items 36, 73, 110	.844
Dissociation Proneness: Cluster 37 / Items 37, 74, 111	.676

Note. All of the above correlations are significant at $p < .001$.

Table 5. *Pilot Study Correlations Between Each Individual Item and Its Corresponding Cluster Score*

Item / Cluster	Spearman's rho (r_s)
Item 1 / Cluster 1	.546
Item 38 / Cluster 1	.549
Item 75 / Cluster 1	.552
Item 2 / Cluster 2	.605
Item 39 / Cluster 2	.742
Item 76 / Cluster 2	.515
Item 3 / Cluster 3	.480
Item 40 / Cluster 3	.634
Item 77 / Cluster 3	.548
Item 4 / Cluster 4	.551
Item 41 / Cluster 4	.338
Item 78 / Cluster 4	.499
Item 5 / Cluster 5	.680
Item 42 / Cluster 5	.671
Item 79 / Cluster 5	.767

Table 5 (continued). *Pilot Study Correlations Between Each Individual Item and Its Corresponding Cluster Score*

Item / Cluster	Spearman's rho (r_s)
Item 6 / Cluster 6	.657
Item 43 / Cluster 6	.520
Item 80 / Cluster 6	.620
Item 7 / Cluster 7	.705
Item 44 / Cluster 7	.649
Item 81 / Cluster 7	.628
Item 8 / Cluster 8	.591
Item 45 / Cluster 8	.661
Item 82 / Cluster 8	.364
Item 9 / Cluster 9	.623
Item 46 / Cluster 9	.532
Item 83 / Cluster 9	.423
Item 10 / Cluster 10	.580
Item 47 / Cluster 10	.577
Item 84 / Cluster 10	.508
Item 11 / Cluster 11	.682
Item 48 / Cluster 11	.671
Item 85 / Cluster 11	.620
Item 12 / Cluster 12	.597
Item 49 / Cluster 12	.586
Item 86 / Cluster 12	.382

Table 5 (continued). *Pilot Study Correlations Between Each Individual Item and Its Corresponding Cluster Score*

Item / Cluster	Spearman's rho (r_s)
Item 13 / Cluster 13	.599
Item 50 / Cluster 13	.582
Item 87 / Cluster 13	.525
Item 14 / Cluster 14	.676
Item 51 / Cluster 14	.595
Item 88 / Cluster 14	.571
Item 15 / Cluster 15	.439
Item 52 / Cluster 15	.484
Item 89 / Cluster 15	.415
Item 16 / Cluster 16	.511
Item 53 / Cluster 16	.549
Item 90 / Cluster 16	.696
Item 17 / Cluster 17	.728
Item 54 / Cluster 17	.641
Item 91 / Cluster 17	.590
Item 18 / Cluster 18	.532
Item 55 / Cluster 18	.651
Item 92 / Cluster 18	.421
Item 19 / Cluster 19	.771
Item 56 / Cluster 19	.537
Item 93 / Cluster 19	.660

Table 5 (continued). *Pilot Study Correlations Between Each Individual Item and Its Corresponding Cluster Score*

Item / Cluster	Spearman's rho (r_s)
Item 20 / Cluster 20	.771
Item 57 / Cluster 20	.777
Item 94 / Cluster 20	.710
Item 21 / Cluster 21	.673
Item 58 / Cluster 21	.714
Item 95 / Cluster 21	.793
Item 22 / Cluster 22	.390
Item 59 / Cluster 22	.568
Item 96 / Cluster 22	.655
Item 23 / Cluster 23	.722
Item 60 / Cluster 23	.630
Item 97 / Cluster 23	.622
Item 24 / Cluster 24	.623
Item 61 / Cluster 24	.665
Item 98 / Cluster 24	.469
Item 25 / Cluster 25	.749
Item 62 / Cluster 25	.693
Item 99 / Cluster 25	.830
Item 26 / Cluster 26	.768
Item 63 / Cluster 26	.726
Item 100 / Cluster 26	.413

Table 5 (continued). *Pilot Study Correlations Between Each Individual Item and Its Corresponding Cluster Score*

Item / Cluster	Spearman's rho (r_s)
Item 27 / Cluster 27	.616
Item 64 / Cluster 27	.484
Item 101 / Cluster 27	.470
Item 28 / Cluster 28	.703
Item 65 / Cluster 28	.606
Item 102 / Cluster 28	.446
Item 29 / Cluster 29	.744
Item 66 / Cluster 29	.570
Item 103 / Cluster 29	.544
Item 30 / Cluster 30	.696
Item 67 / Cluster 30	.516
Item 104 / Cluster 30	.548
Item 31 / Cluster 31	.805
Item 68 / Cluster 31	.756
Item 105 / Cluster 31	.675
Item 32 / Cluster 32	.530
Item 69 / Cluster 32	.414
Item 106 / Cluster 32	.392
Item 33 / Cluster 33	.591
Item 70 / Cluster 33	.675
Item 107 / Cluster 33	.602

Table 5 (continued). *Pilot Study Correlations Between Each Individual Item and Its Corresponding Cluster Score*

Item / Cluster	Spearman's rho (r_s)
Item 34 / Cluster 34	.669
Item 71 / Cluster 34	.591
Item 108 / Cluster 34	.550
Item 35 / Cluster 35	.634
Item 72 / Cluster 35	.710
Item 109 / Cluster 35	.620
Item 36 / Cluster 36	.788
Item 73 / Cluster 36	.753
Item 110 / Cluster 36	.760
Item 37 / Cluster 37	.465
Item 74 / Cluster 37	.568
Item 111 / Cluster 37	.599

Note. All of the above correlations are significant at $p < .001$.

Table 6. *Pilot Study Correlation Between Overall Cluster Mean and Overall Item Mean*

Variables	Spearman's rho (r_s)
Overall Cluster Mean / Overall Item Mean	.878*

Note. * $p < .001$.

Table 7. *Pilot Study Mean Differences Between Cluster Scores and Averages of Combined Corresponding Items for BAT37 Traits*

	Wilcoxon Signed Ranks Test	
BAT37 Trait: Cluster – Items	*Z*	Sig. (2-tailed)
Emotional Lability: Cluster 1 – Items 1, 38, 75	-.777[b]	.437
Anxiousness: Cluster 2 – Items 2, 39, 76	-2.680[b]	.007
Submissiveness: Cluster 3 – Items 3, 40, 77	-.301[a]	.763
Separation Insecurity: Cluster 4 – Items 4, 41, 78	-.871[a]	.384
Pessimism: Cluster 5 – Items 5, 42, 79	-1.630[a]	.103
Low Self-Esteem: Cluster 6 – Items 6, 43, 80	-.608[a]	.543
Guilt/Shame: Cluster 7 – Items 7, 44, 81	-1.758[a]	.079
Self-Harm: Cluster 8 – Items 8, 45, 82	-.927[a]	.354
Depressivity: Cluster 9 – Items 9, 46, 83	-.062[a]	.950
Suspiciousness: Cluster 10 – Items 10, 47, 84	-3.028[b]	.002
Social Withdrawal: Cluster 11 – Items 11, 48, 85	-1.481[b]	.139
Social Detachment: Cluster 12 – Items 12, 49, 86	-1.697[b]	.090
Intimacy Avoidance: Cluster 13 – Items 13, 50, 87	-2.406[b]	.016
Restricted Affectivity: Cluster 14 – Items 14, 51, 88	-1.391[a]	.164
Anhedonia: Cluster 15 – Items 15, 52, 89	-.767[a]	.443
Callousness: Cluster 16 – Items 16, 53, 90	-2.258[b]	.024
Manipulativeness: Cluster 17 – Items 17, 54, 91	-3.399[b]	.001
Narcissism: Cluster 18 – Items 18, 55, 92	-6.082[b]	.000
Histrionism: Cluster 19 – Items 19, 56, 93	-.585[b]	.558
Hostility: Cluster 20 – Items 20, 57, 94	-.610[a]	.542
Aggression: Cluster 21 – Items 21, 58, 95	-.989[b]	.323

Table 7 (continued). *Pilot Study Mean Differences Between Cluster Scores and Averages of Combined Corresponding Items for BAT37 Traits*

	Wilcoxon Signed Ranks Test	
BAT 37 Trait: Cluster – Items	*Z*	Sig. (2-tailed)
Oppositionality: Cluster 22 – Items 22, 59, 96	-.616[b]	.538
Deceitfulness: Cluster 23 – Items 23, 60, 97	-.590[b]	.555
Impulsivity: Cluster 24 – Items 24, 61, 98	-3.597[a]	.000
Distractibility: Cluster 25 – Items 25, 62, 99	-1.796[a]	.072
Recklessness: Cluster 26 – Items 26, 63, 100	-.873[a]	.383
Irresponsibility: Cluster 27 – Items 27, 64, 101	-1.578[b]	.115
Perfectionism: Cluster 28 – Items 28, 65, 102	-.440[a]	.660
Perseveration: Cluster 29 – Items 29, 66, 103	-3.098[b]	.002
Rigidity: Cluster 30 – Items 30, 67, 104	-2.496[b]	.013
Orderliness: Cluster 31 – Items 31, 68, 105	-1.639[b]	.101
Risk Aversion: Cluster 32 – Items 32, 69, 106	-1.188[b]	.235
Unusual Perceptions: Cluster 33 – Items 33, 70, 107	-.587[b]	.557
Unusual Beliefs: Cluster 34 – Items 34, 71, 108	-.072[a]	.943
Eccentricity: Cluster 35 – Items 35, 72, 109	-2.337[b]	.019
Cognitive Dysregulation: Cluster 36 – Items 36, 73, 110	-.816[a]	.415
Dissociation Proneness: Cluster 37 – Items 37, 74, 111	-.888[b]	.375

Note. [a] Cluster with higher sum of ranks. [b] Items with higher sum of ranks.

Table 8. *Pilot Study Mean Difference Between Overall Cluster Mean and Overall Item Mean*

Variables	Wilcoxon Signed Ranks Test	
	Z	Sig. (2-tailed)
Overall Cluster Mean – Overall Item Mean	-1.753[a]	.080

Note. [a] Cluster with higher sum of ranks.

Table 9. *Pilot Study Descriptive Statistics for Each Item and Cluster*

Variable	*N*	Mean	*SD*	Skewness	Kurtosis
Item 1	164	1.26	.996	.282	-.971
Item 2	164	1.15	.980	.494	-.735
Item 3	164	.90	.816	.594	-.237
Item 4	164	1.26	.971	.225	-.952
Item 5	163	.69	.828	1.038	.354
Item 6	164	.53	.787	1.353	.981
Item 7	164	.66	.824	1.028	.213
Item 8	164	.05	.277	5.527	32.215
Item 9	164	.48	.678	1.465	2.193
Item 10	164	1.06	.989	.493	-.861
Item 11	163	.82	.902	.871	-.110
Item 12	164	.42	.799	1.872	2.561
Item 13	164	1.08	1.119	.534	-1.141
Item 14	164	.98	1.045	.768	-.624
Item 15	164	.24	.544	2.404	5.910
Item 16	164	.27	.608	2.778	8.585
Item 17	164	.39	.651	1.700	2.671

Table 9 (continued). *Pilot Study Descriptive Statistics for Each Item and Cluster*

Variable	*N*	Mean	*SD*	Skewness	Kurtosis
Item 18	164	.32	.614	1.936	3.183
Item 19	164	.76	.844	.860	-.086
Item 20	164	.92	1.015	.837	-.446
Item 21	164	.73	.929	1.086	.144
Item 22	164	.24	.552	2.703	8.151
Item 23	164	.28	.560	2.101	4.473
Item 24	164	1.07	.937	.532	-.590
Item 25	164	1.60	.988	-.177	-.980
Item 26	164	1.49	.937	.131	-.859
Item 27	164	.39	.641	1.550	1.772
Item 28	164	1.32	1.021	.226	-1.060
Item 29	164	1.15	1.001	.395	-.940
Item 30	164	1.07	.921	.486	-.624
Item 31	164	1.41	.990	.240	-.963
Item 32	164	.66	.747	.830	-.104
Item 33	164	.58	.821	1.390	1.276
Item 34	164	1.05	1.081	.568	-1.014
Item 35	164	.80	.919	.878	-.222
Item 36	164	.92	.997	.762	-.558
Item 37	164	.27	.544	1.933	2.815
Item 38	164	.78	.947	.980	-.101
Item 39	164	1.22	1.091	.270	-1.279

Table 9 (continued). *Pilot Study Descriptive Statistics for Each Item and Cluster*

Variable	*N*	Mean	*SD*	Skewness	Kurtosis
Item 40	164	.52	.705	1.191	.856
Item 41	164	.29	.594	2.123	4.065
Item 42	164	.73	.887	1.036	.202
Item 43	164	.20	.494	2.862	9.073
Item 44	164	.74	.884	.959	-.003
Item 45	164	.12	.454	4.482	22.180
Item 46	164	.25	.524	2.283	5.786
Item 47	164	.77	.876	.969	.165
Item 48	164	.49	.903	1.756	1.863
Item 49	164	.53	.810	1.550	1.780
Item 50	164	.45	.793	1.915	3.141
Item 51	164	.83	1.025	.938	-.397
Item 52	164	.12	.411	4.075	19.486
Item 53	163	.27	.578	2.232	4.692
Item 54	164	.37	.675	1.930	3.494
Item 55	164	.37	.576	1.322	.775
Item 56	164	.59	.734	1.208	1.246
Item 57	164	.72	1.025	1.210	.141
Item 58	164	.72	.930	1.051	-.003
Item 59	164	.44	.638	1.163	.230
Item 60	164	.57	.784	1.225	.744
Item 61	164	1.36	.933	.278	-.752

Table 9 (continued). *Pilot Study Descriptive Statistics for Each Item and Cluster*

Variable	*N*	Mean	*SD*	Skewness	Kurtosis
Item 62	164	1.30	.979	.439	-.770
Item 63	164	.99	.972	.633	-.642
Item 64	164	.27	.532	2.126	5.009
Item 65	164	1.29	1.021	.261	-1.047
Item 66	164	1.05	.955	.575	-.597
Item 67	164	1.27	1.059	.247	-1.172
Item 68	164	1.49	1.110	.097	-1.337
Item 69	163	.49	.773	1.738	2.744
Item 70	164	.30	.600	2.342	6.363
Item 71	164	.62	.854	1.250	.666
Item 72	164	.62	.902	1.280	.559
Item 73	164	.77	.888	.992	.196
Item 74	164	.59	.836	1.227	.481
Item 75	164	.60	.848	1.411	1.327
Item 76	164	.62	.839	1.330	1.106
Item 77	164	.91	1.032	.829	-.543
Item 78	164	1.12	1.110	.531	-1.091
Item 79	164	.48	.722	1.474	1.651
Item 80	164	.38	.694	2.005	3.846
Item 81	164	.40	.757	2.011	3.505
Item 82	164	.03	.233	7.949	63.865
Item 83	163	.18	.429	2.384	.5.196

Table 9 (continued). *Pilot Study Descriptive Statistics for Each Item and Cluster*

Variable	*N*	Mean	*SD*	Skewness	Kurtosis
Item 84	164	.25	.600	2.422	5.075
Item 85	164	.95	1.050	.839	-.519
Item 86	164	.63	.886	1.379	1.095
Item 87	164	.33	.656	2.038	3.604
Item 88	162	.52	.872	1.621	1.605
Item 89	164	.21	.548	2.796	7.504
Item 90	164	.24	.563	2.706	7.868
Item 91	164	1.24	1.032	.287	-1.088
Item 92	164	1.32	1.032	.078	-1.201
Item 93	164	.91	1.030	.753	-.702
Item 94	164	.65	.856	1.227	.725
Item 95	164	.54	.882	1.690	2.001
Item 96	164	.47	.817	1.738	2.172
Item 97	164	.21	.450	2.053	3.530
Item 98	164	.87	.967	.838	-.356
Item 99	163	1.47	1.090	.116	-1.279
Item 100	164	1.55	1.011	-.025	-1.085
Item 101	164	.38	.658	1.900	3.683
Item 102	163	1.53	1.038	-.007	-1.158
Item 103	163	1.07	1.055	.567	-.928
Item 104	164	.91	.889	.699	-.290
Item 105	163	1.19	1.069	.441	-1.050

Table 9 (continued). *Pilot Study Descriptive Statistics for Each Item and Cluster*

Variable	*N*	Mean	*SD*	Skewness	Kurtosis
Item 106	164	.92	.991	.812	-.417
Item 107	164	.54	.916	1.619	1.492
Item 108	164	.45	.753	1.671	2.079
Item 109	164	.26	.603	2.373	4.856
Item 110	164	.80	.998	1.014	-.157
Item 111	164	.77	.890	.896	-.155
Cluster 1	164	.91	.923	.740	-.336
Cluster 2	164	1.15	1.043	.413	-1.040
Cluster 3	164	.76	.776	.694	-.264
Cluster 4	164	.85	.944	.842	-.311
Cluster 5	164	.57	.830	1.349	.942
Cluster 6	164	.38	.668	1.994	4.275
Cluster 7	164	.69	.911	1.251	.686
Cluster 8	164	.08	.332	4.521	20.966
Cluster 9	164	.30	.569	1.926	3.721
Cluster 10	164	.57	.784	1.225	.744
Cluster 11	164	.70	.935	1.179	.354
Cluster 12	164	.47	.794	1.774	2.542
Cluster 13	164	.52	.779	1.377	1.105
Cluster 14	164	.85	1.052	.969	-.361
Cluster 15	164	.23	.590	2.994	9.281
Cluster 16	164	.19	.423	2.084	3.588

Table 9 (continued). *Pilot Study Descriptive Statistics for Each Item and Cluster*

Variable	*N*	Mean	*SD*	Skewness	Kurtosis
Cluster 17	164	.55	.778	1.380	1.352
Cluster 18	162	.40	.682	1.671	2.215
Cluster 19	164	.72	.848	.940	.016
Cluster 20	164	.77	.974	1.072	.050
Cluster 21	164	.62	.915	1.407	.991
Cluster 22	164	.35	.662	2.029	4.010
Cluster 23	160	.35	.616	1.897	3.804
Cluster 24	160	1.29	.956	.212	-.891
Cluster 25	160	1.55	1.033	.020	-1.153
Cluster 26	160	1.38	.976	.172	-.947
Cluster 27	160	.29	.545	1.944	4.162
Cluster 28	160	1.41	1.018	.041	-1.112
Cluster 29	160	.97	.921	.503	-.788
Cluster 30	160	.96	.893	.624	-.406
Cluster 31	160	1.33	1.062	.291	-1.128
Cluster 32	159	.65	.772	1.037	.532
Cluster 33	160	.46	.816	1.848	2.694
Cluster 34	160	.71	.934	1.074	.031
Cluster 35	160	.48	.760	1.738	2.723
Cluster 36	158	.88	1.018	.868	-.451
Cluster 37	160	.49	.769	1.408	1.045

Altogether, pilot study data analyses indicated few psychometric differences between the form comprised of 37 clusters and the form comprised of 111 items, particularly when considering the forms in their entireties. Given the satisfactory statistical findings of this preliminary study, as well as the investigator's reluctance to alter the content of the forms – so as to keep the subject matter as true as possible to the descriptions provided by the authors of the initially proposed *DSM-5* traits (American Psychiatric Association, 2010) – it was decided to keep the same text in the forms used in ensuing phases of the study. Due to a combination of practical advantage and empirical legitimacy of doing so, it was deemed appropriate to use the 37-cluster version of the BAT37 in the residential SUD treatment sample.

CHAPTER THREE
METHOD

Participants

To address the hypotheses that were posed and accommodate the subsequent statistical analyses that were conducted, two groups of participants were involved in the study. Distinct versions of the BAT37 were administered to 433 students in undergraduate psychology classes at a midsized southern United States university (this number includes the 164 undergraduate students who participated in the pilot study) and 240 individuals who were either clients in a 90-day residential program at a private SUD treatment facility in the United States or, due to concerns about substance use, were referred to undergo a psychological evaluation to determine whether entering treatment at the facility would be appropriate. Among the 240 participants from the SUD treatment facility, 131 (55%) were male and 109 (45%) were female, and their ages ranged from 17 to 77 ($M = 39.95$, $SD = 11.93$).

Measures

Brief Assessment of Traits – 37. The BAT37 was created by Young and Mayer (2010) to measure the initially proposed *DSM-5* trait facets (American Psychiatric Association, 2010). On the BAT37, each of the 37 initially proposed *DSM-5* facets is represented by a cluster of three statements (e.g., *Emotional Lability* is represented by "is emotionally intense," "gets upset very easily," and "has big mood swings"). The three representative statements were derived from the American Psychiatric Association (2010)

descriptions of the traits (see Table 1), were examined by subject-matter experts to scrutinize their content validity, and were reviewed by laypeople to ensure their comprehensibility. The structure of the form was deemed appropriate following a pilot study (see Chapter 2). The instructions on the BAT37 direct subjects to rate on an anchored, four-point scale the degree to which each of the 37 clusters of items describe the person being rated. The four anchors on the scale are: *0 – does not describe me at all*, *1 – mildly describes me*, *2 – moderately describes me*, and *3 – describes me extremely well.* For this study, the BAT37 was expanded into two corresponding surveys, each of which is designed to measure from distinct perspectives the presence and severity of the proposed *DSM-5* trait facets in individuals.

The student-report BAT37, which is identical to the 37-cluster form administered in the pilot study (see Chapter 2 and Appendix A), instructs participants to rate how well each of the clusters presently describes them.

On the two-stage client-report BAT37 (see Appendix B), subjects were asked to indicate on the first half of the survey how well each cluster of statements describes them "over the past few months." This phrasing was deliberately intended to produce a self-assessment of the subjects' personalities during active substance use, as each client completed the BAT37 as part of an evaluation either shortly following their admittance to the residential SUD treatment facility or, due to concerns about substance use by a third party (e.g., employer or professional regulatory body), as part of an evaluation to determine whether treatment would be appropriate. The first half of the client-report BAT37 is referred to as the "client-current-report" in this paper. On the second half of the survey, subjects were asked to estimate their most recent age before they began

regularly using drugs and/or alcohol (not including tobacco) and indicate how well each cluster of statements describes them at the age that they specify. When subjects were asked to retrospectively describe their personality characteristics, the content of each of the three representative statements remained the same as the first half but the statements were converted into the past tense (e.g., *Emotional Lability* is represented by "was emotionally intense," "got upset very easily," and "had big mood swings"). The second half the client-report BAT37 is referred to as the "client-before-report" in this paper.

Personality Assessment Inventory. The PAI (Morey, 1991, 1996, 2007) is an objective measure of personality pathology and clinical psychopathology. It has, since its inception, grown to become one of the most widely used psychological assessment instruments (Belter & Piotrowski, 2001; Boccaccini & Brodsky, 1999), with its prevalence increasing in each year of its existence (Weiner & Greene, 2008). The PAI is comprised of 4 validity scales, 11 clinical scales, 27 clinical subscales, 5 treatment scales, 3 treatment subscales, and 2 interpersonal scales (see Tables 10 through 13 for descriptions of each scale adapted from Morey, 2003). Each of the 344 items on the PAI contributes to only one non-overlapping scale. Median alpha internal consistency values for the test's full scales (i.e., non-subscales) were .81, .82, and .86 in normative, college, and clinical samples, respectively (Morey, 2007).

Table 10. *PAI Validity Scales*

Scale (Abbreviation)	Description
Inconsistency (*ICN*)	Pairs of items which are strongly correlated. Indicates whether the individual is responding consistently on the inventory.

Table 10 (continued). *PAI Validity Scales*

Scale (Abbreviation)	Description
Infrequency (*INF*)	Indicates whether the individual is responding carelessly, randomly, or idiosyncratically. Items are not related to psychopathology and have extremely high or low rates of endorsement.
Negative Impression (*NIM*)	Suggests an excessively unfavorable impression of oneself or malingering.
Positive Impression (*PIM*)	Suggests an excessively favorable impression of oneself or reluctance to admit to even minor shortcomings.

Table 11. *PAI Clinical Scales and Corresponding Clinical Subscales*

Scale / Subscale (Abbreviation)	Description
Somatic Complaints (*SOM*)	Pertains to preoccupation with health concerns and somatic complaints associated with somatization or conversion disorders.
Conversion (*SOM-C*)	Pertains to rare symptoms of sensory and motor dysfunctions related to conversion disorder; can also be elevated if certain medical problems are present in the individual.
Somatization (*SOM-S*)	Pertains to the regular occurrence of common physical symptoms and vague complaints of poor health and fatigue.
Health Concerns (*SOM-H*)	Pertains to a preoccupation with the state of the individual's health and physical problems.
Anxiety (*ANX*)	Pertains to the subjective experience and observable signs of anxiety.
Cognitive (*ANX-C*)	Pertains to persistent worry and concern regarding current issues and resulting deficits in concentration and attention.
Affective (*ANX-A*)	Pertains to the subjective experience of tension, difficulty in relaxing, and tiredness in response to high perceived stress.

Table 11 (continued). *PAI Clinical Scales and Corresponding Clinical Subscales*

Scale / Subscale (Abbreviation)	Description
Physiological (ANX-P)	Pertains to objective signs of tension and stress, such as sweaty or trembling hands, complaints of irregular heartbeats, and breathing difficulties.
Anxiety-Related Disorders (ARD)	Pertains to symptoms and behaviors associated with specific anxiety disorders – particularly phobias, traumatic stress, and obsessive-compulsive symptoms.
Obsessive-Compulsive (ARD-O)	Pertains to intrusive thoughts, compulsive tendencies, and emotional constriction.
Phobias (ARD-P)	Pertains to common phobic fears, including social situations, public transportation, heights, and small spaces.
Traumatic Stress (ARD-T)	Pertains to the experience of traumatic events that cause lasting distress and that are viewed as having left the individual altered or damaged in some way.
Depression (DEP)	Pertains to symptoms and the subjective experience of depressive disorders.
Cognitive (DEP-C)	Pertains to thoughts of worthlessness, hopelessness, and failure in addition to indecisiveness and concentration difficulties.
Affective (DEP-A)	Pertains to the subjective experience of sadness, loss of interest in activities, and lack of pleasure.
Physiological (DEP-P)	Pertains to energy level and level of physical functioning, including disturbance in sleep pattern, changes in appetite, and weight loss.
Mania (MAN)	Pertains to emotional, cognitive, and behavioral symptoms of mania and hypomania.
Activity Level (MAN-A)	Pertains to high involvement in an array of activities in a relatively disorganized manner, and the experience of accelerated thoughts and behavior.

Table 11 (continued). *PAI Clinical Scales and Corresponding Clinical Subscales*

Scale / Subscale (Abbreviation)	Description
Grandiosity (*MAN-G*)	Pertains to inflated self-esteem and the belief that one is excessively special and/or unique.
Irritability (*MAN-I*)	Pertains to the presence of strained relationships stemming from the individual's frustration with the inability or unwillingness of other people to keep up with their sometimes unrealistic plans, demands, and ideas.
Paranoia (*PAR*)	Pertains to symptoms of paranoid disorders and to hallmark characteristics of the paranoid personality.
Hypervigilance (*PAR-H*)	Pertains to suspiciousness and the proclivity to monitor the environment for slights by other people.
Persecution (*PAR-P*)	Pertains to the belief that one has been treated unfairly and that others are making an effort to undermine one's interests.
Resentment (*PAR-R*)	Pertains to cynicism in relationships with others and a tendency to hold grudges and externalize blame for one's problems.
Schizophrenia (*SCZ*)	Pertains to symptoms related to the spectrum of schizophrenic disorders.
Psychotic Experiences (*SCZ-P*)	Pertains to the experience of odd perceptions and sensations, magical thinking, and unusual beliefs which may be delusional.
Social Detachment (*SCZ-S*)	Pertains to social alienation, social discomfort, and awkwardness in interactions with others.
Thought Disorder (*SCZ-T*)	Pertains to confusion, concentration problems, and disorganized thought processes.
Borderline Features (*BOR*)	Pertains to attributes suggestive of a borderline level of personality functioning, including unstable interpersonal relations, impulsivity, emotional lability and instability, and unrestrained anger.

Table 11 (continued). *PAI Clinical Scales and Corresponding Clinical Subscales*

Scale / Subscale (Abbreviation)	Description
Affective Instability (*BOR-A*)	Pertains to affective responsiveness, rapid mood fluctuations, and poor control over emotion.
Identity Problems (*BOR-I*)	Pertains to uncertainty regarding major life issues, feelings of emptiness, lack of fulfillment, and lack of purpose.
Negative Relationships (*BOR-N*)	Pertains to a history of ambivalent, intense relationships in which one has experienced feelings of exploitation and betrayal.
Self-Harm (*BOR-S*)	Pertains to impulsivity in areas that have high potential for adverse consequences.
Antisocial Features (*ANT*)	Pertains to history of illicit acts and problems with authority, egocentricity, lack of empathy and loyalty, lack of stability, and excitement-seeking.
Antisocial Behaviors (*ANT-A*)	Pertains to a history of antisocial behaviors and involvement in illicit activities.
Egocentricity (*ANT-E*)	Pertains to a lack of empathy or remorse and an exploitative approach to interpersonal relationships.
Stimulus-Seeking (*ANT-S*)	Pertains to a strong desire for excitement and sensation, a low tolerance for boredom, and a proclivity to be reckless and engage in risk-taking.
Alcohol Problems (*ALC*)	Pertains to negative consequences of alcohol use and features of alcohol dependence.
Drug Problems (*DRG*)	Pertains to negative consequences of drug use (both prescription and illegal) and features of drug dependence.

Table 12. *PAI Treatment Scales and Corresponding Treatment Subscales*

Scale / Subscale (Abbreviation)	Description
Aggression (AGG)	Pertains to attributes and attitudes related to hostility, anger, aggression, and assertiveness.
Aggressive Attitude (AGG-A)	Pertains to hostility, low control over expression of anger, and a belief in the value of aggression.
Verbal Aggression (AGG-V)	Pertains to verbal expressions of anger ranging from assertiveness to abusiveness and to a readiness to vocalize anger to others.
Physical Aggression (AGG-P)	Pertains to a tendency to engage in physical demonstrations of anger, such as damage to property, physical altercations, and threats of violence.
Suicidal Ideation (SUI)	Pertains to suicidal ideation, ranging from hopelessness to thoughts and plans for suicide.
Stress (STR)	Pertains to the effect of recent stressors in major life areas.
Nonsupport (NON)	Pertains to a lack of perceived support from others, considering both the level and quality of such support.
Treatment Rejection (RXR)	Pertains to attributes and attitudes that are indicative of a lack of interest and motivation to make personal changes which are psychological or emotional in nature.

Table 13. *PAI Interpersonal Scales*

Scale (Abbreviation)	Description
Dominance (DOM)	Measures the extent to which an individual is controlling and autonomous in relationships with others. This scale is reflective of a bipolar dimension, with a dominant style at the high end and a submissive style at the low end.
Warmth (WRM)	Measures the extent to which an individual is interested in supportive and empathic relationships with others. This scale is reflective of a bipolar dimension, with a warm and outgoing style at the high end and a cold and rejecting style at the low end.

Dimensional Assessment of Personality Pathology – Basic Questionnaire. The DAPP-BQ (Livesley & Jackson, 2009) consists of 290 items which assess 18 empirically derived maladaptive personality dimensions (see Table 14 for a description of each scale adapted from Livesley and Jackson). Data for the *Self-Harm* scale of the DAPP-BQ were not available for the present study. As such, its description is not included in Table 14 and only 17 of the 18 DAPP-BQ scales were included in statistical analyses. The DAPP-BQ, despite being developed to assess the presence and severity of the basic dimensions of personality disorders, is suggested to be appropriate for use in both clinical and non-clinical settings. The *DAPP-BQ Technical Manual* (Livesley & Jackson) reports that alpha internal consistency values for the scales of the test ranged from .84 to .95 in a clinical sample (n = 656), .85 to .94 in a general sample (n = 196), and .83 to .92 in a twin sample (n = 1,346).

Table 14. *DAPP-BQ Scales*

Scale	Description
Affective Lability	Affective experiences tend to be intense and unstable; demonstrates frequent mood changes; affective reactions often present as extreme.
Anxiousness	Easily and often feels fearful and worried.
Callousness	Lack of regard for others' feelings and well being; lacks empathy and remorse.
Compulsivity	Orderly and methodical; prefers structure and organization.
Conduct Problems	Proclivity to engage in antisocial behaviors and convey disregard for social norms.
Cognitive Dysregulation	Thoughts tend to become disorganized, especially when stressed; experiences odd perceptions and ideas.
Identity Problems	Unstable identity and/or sense of self.

Table 14 (continued). *DAPP-BQ Scales*

Scale	Description
Insecure Attachment	Pattern of fearfulness in attachment relationships.
Intimacy Problems	Avoids intimacy in relationships with others.
Low Affiliation	Lack of interest in, and avoidance of, relationships and contact with others; socially detached.
Narcissism	Grandiose with a strong desire for attention and approval.
Oppositionality	Passively resists others' expectations of acceptable performance of routine tasks.
Rejection	Antagonistic, combative, and judgmental.
Restricted Expression	Affectively unresponsive and distant.
Stimulus Seeking	Desires excitement and stimulation, reckless and impulsive.
Submissiveness	Subservient and unassertive in relation to others, persistently looks to others for reassurance.
Suspiciousness	Distrustful in relation to others; hyperalert to signs of threat and ill-intent from others.

HEXACO Personality Inventory – Revised. The HEXACO-PI-R (Ashton & Lee, 2009; Lee & Ashton, 2004) consists of 200 items which assess six domain-level personality dimensions, 24 facet-level personality dimensions, and one interstitial personality dimension. Unlike the scales of the PAI and DAPP-BQ, the majority of the dimensions/scales of the HEXACO-PI-R assess non-pathological constructs. Each dimension was derived from cross-cultural lexical studies of personality structure and theoretical interpretations of the results of such studies (e.g., Ashton & Lee, 2001, 2007; Saucier, 2009; see Table 15 for a description of each scale adapted from Lee and Ashton, 2011). The HEXACO-PI-R is the revised version of the HEXACO-PI, the scales of

which were reported by Lee and Ashton (2004) to demonstrate alpha internal consistency values that ranged between .75 and .92.

Table 15. *HEXACO-PI-R Scales*

Domain / Facet	Description
Honesty-Humility	High scorers on this scale do not manipulate others for personal gain, feel little temptation to break rules, are not interested in wealth and luxuries, and do not feel special entitlement to elevated social status. Contrarily, low scorers on this scale flatter others to get what they want, break rules for personal gain, are motivated by material wealth, and possess a strong sense of self-importance.
Sincerity	This scale measures a tendency to be genuine in relationships with others. Low scorers flatter others or pretend to like them in order to obtain favors, whereas high scorers do not manipulate others.
Fairness	This scale measures a tendency to avoid deception and corruption. Low scorers are willing to gain by cheating or stealing, whereas high scorers are unwilling to take advantage of others.
Greed Avoidance	This scale measures a tendency to have low interest in possessing luxury goods and signs of high social status. Low scorers prefer to enjoy and to display wealth and privilege, whereas high scorers are not motivated by monetary gain or heightened social-status.
Modesty	This scale measures a tendency to be humble and unassuming. Low scorers consider themselves to be superior and entitled to privileges that others do not have, whereas high scorers consider themselves to be ordinary people who are not deserving of special treatment.
Emotionality	High scorers on this scale are fearful of physical dangers, experience anxiety in response to stressors, demonstrate a need for emotional support from others, and feel empathy and sentimental attachments with others. Contrarily, low scorers on this scale are not discouraged by the possibility of physical harm, feel little worry even in stressful situations, have little need to share their concerns with others, and feel emotionally distant from others.

Table 15 (continued). *HEXACO-PI-R Scales*

Domain / Facet	Description
Fearfulness	This scale measures a tendency to experience fear. Low scorers feel little fear of injury and are relatively hardy and insensitive to physical pain, whereas high scorers are strongly inclined to avoid physical harm.
Anxiety	This scale measures a tendency to worry in an array of contexts. Low scorers feel limited stress in response to difficulties, whereas high scorers often become preoccupied even by relatively mild problems.
Dependence	This scale measures one's need for emotional support from others. Low scorers feel self-assured and able to cope with difficulties without help or advice, whereas high scorers prefer to share their difficulties with those who will provide them with comfort.
Sentimentality	This scale measures a tendency to feel strong emotional bonds with others. Low scorers experience little emotion when saying good-bye or in response to the concerns of others, whereas high scorers feel strong emotional attachments and an empathic sensitivity to the emotions of others.
Extraversion	High scorers on this scale feel positively about themselves, feel confident when leading or otherwise addressing groups of people, enjoy socializing, and experience enthusiasm and energy. Conversely, low scorers on this scale view themselves as unpopular, feel awkward when they are the center of attention, are indifferent to social activities, and feel less lively and optimistic than others.
Social Self-Esteem	This scale measures a tendency to possess positive self-regard, particularly in social contexts. High scorers are generally satisfied with themselves and consider themselves to be likable, whereas low scorers tend to have a sense of worthlessness and to view themselves as unpopular.

Table 15 (continued). *HEXACO-PI-R Scales*

Domain / Facet	Description
Social Boldness	This scale measures one's comfort or confidence within an array of social situations. Low scorers feel shy or awkward in positions of leadership or when speaking publicly, whereas high scorers are willing to approach strangers and are comfortable speak up when in group settings.
Sociability	This scale measures a tendency to enjoy socializing with others and social activities. Low scorers generally prefer solitary activities and do not seek out the company of others, whereas high scorers enjoy talking, visiting, and celebrating with others.
Liveliness	This scale measures one's typical enthusiasm and energy. Low scorers tend not to feel particularly cheerful or dynamic, whereas high scorers often demonstrate optimism and high spirits.
Agreeableness	High scorers on this scale are forgiving, are lenient in judging others, are willing to cooperate with others, and can control their temper well. Contrarily, low scorers on this scale are vengeful, are critical of others' shortcomings, are stubborn in defending their point of view, and feel anger readily in response to mistreatment from others.
Forgiveness	This scale measures one's willingness to trust and like those who may have caused them harm. Low scorers tend to be vindictive toward those who have wronged them, whereas high scorers are usually ready to trust others and re-establish amicable relations after having been treated badly.
Gentleness	This scale measures a tendency to be lenient in dealings with others. Low scorers tend to critically evaluate others, whereas high scorers are less likely to judge others harshly.
Flexibility	This scale measures one's willingness to compromise and cooperate with others. Low scorers are seen as stubborn and argumentative, whereas high scorers avoid arguments and accommodate the suggestions of others, even when such suggestions may be unreasonable.

Table 15 (continued). *HEXACO-PI-R Scales*

Domain / Facet	Description
Patience	This scale measures a tendency to be calm rather than angry. Low scorers tend to easily lose their tempers, whereas high scorers demonstrate a high threshold for feeling or expressing anger.
Conscientiousness	High scorers on this scale organize their time and physical surroundings, work toward their goals in a disciplined manner, strive to be accurate and perfect, and deliberate carefully prior to making decisions. Contrarily, low scorers on this scale tend to be unconcerned with order or schedules, avoid challenging tasks or goals, are satisfied with work that is not error-free, and make decisions impulsively.
Organization	This scale measures a proclivity to seek order, especially in one's physical surroundings. Low scorers tend to be sloppy and haphazard, whereas high scorers tend to keep things tidy and demonstrate a structured approach to completing tasks.
Diligence	This scale measures a tendency to work hard. Low scorers have low self-discipline and are not strongly motivated to achieve, whereas high scorers have a strong work ethic and exert themselves.
Perfectionism	This scale measures a tendency to be thorough and detail-oriented. Low scorers tolerate some errors in their work and often neglect details, whereas high scorers check carefully for errors and possible improvements.
Prudence	This scale measures a tendency to deliberate carefully and to inhibit impulses. Low scorers tend to act impulsively and not consider consequences, whereas high scorers contemplate their options carefully and tend to be cautious and self-controlled.

Table 15 (continued). *HEXACO-PI-R Scales*

Domain / Facet	Description
Openness to Experience	High scorers on this scale become absorbed in the beauty of art and nature, are inquisitive about an array of domains of knowledge, use their imaginations freely on a daily basis, and demonstrate an interest in unusual ideas or people. Contrarily, low scorers on this scale are relatively unimpressed by works of art, feel limited intellectual curiosity, avoid creative activities, and demonstrate little attraction toward ideas that are unconventional.
Aesthetic Appreciation	This scale measures one's enjoyment of beauty in art and nature. Low scorers tend not to become absorbed in works of art or natural beauty, whereas high scorers demonstrate a strong appreciation of various art forms and natural beauty.
Inquisitiveness	This scale measures a tendency to seek information regarding, and experience with, the human and natural world. Low scorers demonstrate limited curiosity about the natural or social sciences, whereas high scorers read extensively and are interested in traveling.
Creativity	This scale measures one's preference for innovation and experimentation. Low scorers have little inclination for original thought, whereas high scorers actively seek new solutions to problems and enjoy expressing themselves through art.
Unconventionality	This scale measures a tendency to accept things that are unusual. Low scorers avoid eccentric or nonconforming individuals, whereas high scorers are receptive to ideas that seem to many to be unusual.
Altruism	This scale measures a tendency to be sympathetic toward others. High scorers avoid harming and are generous toward those who are weak or in need of help, whereas low scorers are not bothered by the prospect of harming others and may appear to others as being hard-hearted.

Procedure

Permission to conduct this study was granted by the Institutional Review Board of Louisiana Tech University (see Appendix C). Students who volunteered to complete the student-report BAT37 (n = 433) did so as an extra credit opportunity in their respective undergraduate psychology classes. Client-report BAT37 data were collected from residents (n = 240) at a SUD treatment facility during a comprehensive psychological evaluation that was conducted either shortly following admission into a 90-day SUD treatment program or to assist in determining whether admission into the program would be appropriate. All residential SUD treatment participants included in the study completed the BAT37 and the majority of these individuals also completed the PAI (n = 222), DAPP-BQ (n = 145), and HEXACO-PI-R (n = 165) as part of the same evaluation. All participants signed an informed consent form (see Appendix D) prior to their involvement in the study and were treated in accordance with ethical guidelines established by the American Psychological Association (2002).

CHAPTER FOUR
RESULTS

Descriptive Statistics

Descriptive statistics for the BAT37, PAI, DAPP-BQ, and HEXACO-PI-R are presented in Tables 16 through 23. Table 16 outlines the BAT37 descriptive statistics for response data from the student-report sample. Due to concerns about potential underreporting of the proposed *DSM-5* personality traits assessed by the BAT37, client-report BAT37 data collected from participants who either did not complete the PAI ($n = 18$) or produced *t*-scores on the PAI's *PIM* scale which were greater than or equal to 68 ($n = 15$) were excluded from several statistical analyses. A *PIM* scale cutoff of $t \geq 68$ was chosen due to Morey's (2003) statement that scores in this range "suggest that the respondent attempted to portray himself or herself as exceptionally free of the common shortcomings to which most individuals will admit" (p. 61). Descriptive statistics for client-current-report BAT37 response data including participants who either did not complete the PAI or produced high *PIM* scores are detailed in Table 17, and descriptive statistics for client-current-report and client-before-report BAT37 response data excluding such participants are detailed in Table 18 and Table 19, respectively. Descriptive statistics for combined student-report and client-current-report BAT37 response data (including all participants) are detailed in Table 20. Descriptive statistics for *t*-scores from PAI, DAPP-BQ, and HEXACO-PI-R client data, excluding participants based on the aforementioned criteria, are detailed in Tables 21, 22, and 23, respectively.

Table 16. *Student-Report BAT37 Descriptive Statistics*

BAT37 Trait	*N*	Mean	*SD*	Skewness	Kurtosis
Emotional Lability	433	.86	.868	.741	-.230
Anxiousness	433	1.14	.986	.427	-.871
Submissiveness	433	.68	.773	.890	.095
Separation Insecurity	433	.86	.907	.773	-.332
Pessimism	431	.60	.803	1.224	.784
Low Self-Esteem	430	.40	.691	1.754	2.551
Guilt/Shame	430	.64	.862	1.282	.884
Self-Harm	432	.08	.382	5.339	30.970
Depressivity	431	.33	.588	1.902	3.776
Suspiciousness	431	.52	.727	1.190	.577
Social Withdrawal	427	.68	.915	1.209	.465
Social Detachment	433	.39	.726	2.014	8.776
Intimacy Avoidance	433	.46	.754	1.652	2.115
Restricted Affectivity	433	.79	.973	.987	-.186
Anhedonia	433	.21	.537	2.914	8.776
Callousness	431	.19	.464	2.587	6.960
Manipulativeness	432	.41	.692	1.792	2.952
Narcissism	430	.38	.642	1.635	2.033
Histrionism	432	.58	.757	1.118	.520
Hostility	432	.78	.892	.929	-.044
Aggression	431	.41	.738	1.941	3.331
Oppositionality	430	.27	.585	2.469	6.523
Deceitfulness	428	.30	.556	1.939	4.036

Table 16 (continued). *Student-Report BAT37 Descriptive Statistics*

BAT37 Trait	*N*	Mean	*SD*	Skewness	Kurtosis
Impulsivity	429	1.20	.900	.328	-.661
Distractibility	429	1.38	.963	.242	-.884
Recklessness	428	1.24	.939	.306	-.789
Irresponsibility	429	.26	.538	2.287	5.642
Perfectionism	429	1.41	.990	.091	-1.026
Perseveration	428	1.00	.933	.512	-.741
Rigidity	429	.92	.874	.660	-.326
Orderliness	429	1.28	1.015	.329	-.983
Risk Aversion	426	.71	.817	.998	.363
Unusual Perceptions	429	.41	.774	1.929	2.993
Unusual Beliefs	428	.64	.880	1.241	.606
Eccentricity	428	.39	.695	1.948	3.666
Cognitive Dysregulation	426	.73	.923	1.089	.173
Dissociation Proneness	428	.45	.762	1.700	2.157

Table 17. *Client-Current-Report BAT37 Descriptive Statistics Including All Participants*

BAT37 Trait	*N*	Mean	*SD*	Skewness	Kurtosis
Emotional Lability	240	1.01	1.037	.656	-.781
Anxiousness	240	1.27	1.107	.296	-1.261
Submissiveness	240	.77	.894	.831	-.401
Separation Insecurity	239	.90	1.039	.807	-.629
Pessimism	240	.84	.939	.942	-.036

Table 17 (continued). *Client-Current-Report BAT37 Descriptive Statistics Including All Participants*

BAT37 Trait	*N*	Mean	*SD*	Skewness	Kurtosis
Low Self-Esteem	240	.83	1.006	.920	-.384
Guilt/Shame	240	1.09	1.092	.505	-1.111
Self-Harm	240	.28	.737	2.801	6.893
Depressivity	239	.78	.997	1.012	-.204
Suspiciousness	239	.40	.765	1.951	3.051
Social Withdrawal	239	.80	.981	.907	-.420
Social Detachment	238	.56	.897	1.474	1.068
Intimacy Avoidance	240	.63	.914	1.323	.709
Restricted Affectivity	240	.77	.961	.996	-.162
Anhedonia	240	.65	.977	1.255	.263
Callousness	240	.17	.484	3.315	12.289
Manipulativeness	239	.70	1.004	1.202	.139
Narcissism	240	.62	.874	1.323	.846
Histrionism	240	.54	.847	1.575	1.685
Hostility	240	.67	.970	1.255	.349
Aggression	240	.49	.828	1.675	1.942
Oppositionality	240	.58	.860	1.419	1.108
Deceitfulness	240	.53	.838	1.684	2.154
Impulsivity	240	1.07	1.000	.651	-.615
Distractibility	239	1.13	1.104	.466	-1.160
Recklessness	239	.94	1.029	.780	-.605
Irresponsibility	239	.69	1.020	1.260	.223

Table 17 (continued). *Client-Current-Report BAT37 Descriptive Statistics Including All Participants*

BAT37 Trait	*N*	Mean	*SD*	Skewness	Kurtosis
Perfectionism	239	1.41	1.085	.133	-1.259
Perseveration	238	1.06	1.071	.538	-1.031
Rigidity	239	.81	.919	.883	-.206
Orderliness	239	1.08	.943	.508	-.653
Risk Aversion	237	.81	.838	.710	-.326
Unusual Perceptions	238	.12	.448	3.951	15.751
Unusual Beliefs	238	.26	.679	2.809	7.220
Eccentricity	238	.15	.494	3.906	16.299
Cognitive Dysregulation	238	.42	.831	2.069	3.328
Dissociation Proneness	238	.35	.752	2.267	4.394

Table 18. *Client-Current-Report BAT37 Descriptive Statistics Excluding Participants Who Did Not Complete the PAI or Produced PIM T-Scores Greater Than or Equal to 68*

BAT37 Trait	*N*	Mean	*SD*	Skewness	Kurtosis
Emotional Lability	207	1.07	1.036	.578	-.855
Anxiousness	207	1.33	1.097	.220	-1.265
Submissiveness	207	.84	.904	.689	-.630
Separation Insecurity	206	.96	1.059	.726	-.775
Pessimism	207	.90	.942	.837	-.205
Low Self-Esteem	207	.89	1.016	.815	-.560
Guilt/Shame	207	1.16	1.094	.411	-1.172
Self-Harm	207	.28	.750	2.772	6.664

Table 18 (continued). *Client-Current-Report BAT37 Descriptive Statistics Excluding Participants Who Did Not Complete the PAI or Produced PIM T-Scores Greater Than or Equal to 68*

BAT37 Trait	*N*	Mean	*SD*	Skewness	Kurtosis
Depressivity	206	.82	1.018	.956	-.345
Suspiciousness	206	.43	.773	1.848	2.695
Social Withdrawal	206	.82	.979	.872	-.438
Social Detachment	205	.58	.880	1.366	.798
Intimacy Avoidance	207	.67	.919	1.242	.519
Restricted Affectivity	207	.76	.964	1.016	-.116
Anhedonia	207	.68	.984	1.213	.172
Callousness	207	.17	.457	3.083	10.755
Manipulativeness	206	.72	1.001	1.169	.106
Narcissism	207	.66	.889	1.235	.610
Histrionism	207	.57	.861	1.508	1.469
Hostility	207	.70	.955	1.184	.256
Aggression	207	.49	.806	1.698	2.205
Oppositionality	207	.59	.864	1.345	.877
Deceitfulness	207	.54	.829	1.601	1.941
Impulsivity	207	1.14	.997	.545	-.726
Distractibility	206	1.18	1.101	.392	-1.201
Recklessness	206	.98	1.043	.727	-.705
Irresponsibility	206	.73	1.046	1.173	-.019
Perfectionism	206	1.45	1.084	.127	-1.259
Perseveration	205	1.17	1.076	.403	-1.136

Table 18 (continued). *Client-Current-Report BAT37 Descriptive Statistics Excluding Participants Who Did Not Complete the PAI or Produced PIM T-Scores Greater Than or Equal to 68*

BAT37 Trait	*N*	Mean	*SD*	Skewness	Kurtosis
Rigidity	206	.84	.929	.830	-.294
Orderliness	206	1.08	.952	.486	-.720
Risk Aversion	205	.83	.826	.697	-.234
Unusual Perceptions	206	.13	.471	3.805	14.315
Unusual Beliefs	206	.27	.701	2.739	6.803
Eccentricity	206	.16	.512	3.759	15.175
Cognitive Dysregulation	206	.43	.851	2.011	3.022
Dissociation Proneness	206	.37	.778	2.205	4.049

Table 19. *Client-Before-Report BAT37 Descriptive Statistics Excluding Participants Who Did Not Complete the PAI or Produced PIM T-Scores Greater Than or Equal to 68*

BAT37 Trait	*N*	Mean	*SD*	Skewness	Kurtosis
Emotional Lability	160	1.31	1.128	.317	-1.281
Anxiousness	161	1.53	1.107	-.059	-1.327
Submissiveness	160	1.10	.985	.396	-.959
Separation Insecurity	160	1.33	1.131	.163	-1.382
Pessimism	160	1.03	1.006	.613	-.735
Low Self-Esteem	160	1.20	1.086	.398	-1.140
Guilt/Shame	160	1.25	1.116	.344	-1.246
Self-Harm	160	.33	.773	2.503	5.370
Depressivity	156	1.17	1.143	.417	-1.277

Table 19 (continued). *Client-Before-Report BAT37 Descriptive Statistics Excluding Participants Who Did Not Complete the PAI or Produced PIM T-Scores Greater Than or Equal to 68*

BAT37 Trait	*N*	Mean	*SD*	Skewness	Kurtosis
Suspiciousness	157	.64	.928	1.323	.666
Social Withdrawal	157	.96	1.040	.679	-.826
Social Detachment	157	.75	1.006	1.067	-.166
Intimacy Avoidance	157	.83	.999	.808	-.648
Restricted Affectivity	156	.89	1.026	.802	-.619
Anhedonia	157	.84	1.060	.914	-.546
Callousness	157	.51	.896	1.623	1.426
Manipulativeness	157	.93	1.045	.757	-.713
Narcissism	157	.96	1.068	.685	-.883
Histrionism	157	.90	1.008	.816	-.508
Hostility	157	1.13	1.150	.504	-1.214
Aggression	157	.69	1.004	1.223	.188
Oppositionality	157	1.03	1.123	.651	-1.010
Deceitfulness	157	1.02	1.053	.596	-.931
Impulsivity	157	1.55	1.106	.022	-1.340
Distractibility	156	1.36	1.141	.155	-1.397
Recklessness	157	1.45	1.151	.057	-1.432
Irresponsibility	157	1.10	1.192	.550	-1.275
Perfectionism	156	1.31	1.106	.249	-1.273
Perseveration	157	1.26	1.087	.313	-1.196
Rigidity	157	1.27	.998	.211	-1.034

Table 19 (continued). *Client-Before-Report BAT37 Descriptive Statistics Excluding Participants Who Did Not Complete the PAI or Produced PIM T-Scores Greater Than or Equal to 68*

BAT37 Trait	*N*	Mean	*SD*	Skewness	Kurtosis
Orderliness	156	1.07	1.084	.566	-1.009
Risk Aversion	157	.74	.914	1.105	.328
Unusual Perceptions	157	.18	.597	3.572	12.589
Unusual Beliefs	157	.34	.739	2.268	4.387
Eccentricity	157	.36	.735	2.054	3.445
Cognitive Dysregulation	157	.58	.928	1.521	1.197
Dissociation Proneness	158	.51	.843	1.597	1.588

Table 20. *Descriptive Statistics for Combined Student-Report and Client-Current-Report BAT37 Data*

BAT37 Trait	*N*	Mean	*SD*	Skewness	Kurtosis
Emotional Lability	673	.92	.934	.741	-.395
Anxiousness	673	1.19	1.032	.388	-1.021
Submissiveness	673	.71	.818	.886	-.068
Separation Insecurity	672	.87	.955	.800	-.420
Pessimism	671	.69	.861	1.132	.485
Low Self-Esteem	670	.55	.843	1.448	1.187
Guilt/Shame	670	.80	.973	.978	-.169
Self-Harm	672	.15	.544	3.987	15.911
Depressivity	670	.49	.790	1.650	2.074
Suspiciousness	670	.48	.743	1.460	1.388
Social Withdrawal	666	.72	.940	1.091	.086

Table 20 (continued). *Descriptive Statistics for Combined Student-Report and Client-Current-Report BAT37 Data*

BAT37 Trait	*N*	Mean	*SD*	Skewness	Kurtosis
Social Detachment	671	.45	.794	1.801	2.512
Intimacy Avoidance	673	.52	.818	1.541	1.572
Restricted Affectivity	673	.78	.968	.988	-.184
Anhedonia	673	.37	.756	2.121	3.662
Callousness	671	.18	.471	2.860	8.957
Manipulativeness	671	.51	.828	1.619	1.813
Narcissism	670	.46	.742	1.591	1.919
Histrionism	672	.57	.790	1.310	1.042
Hostility	672	.74	.922	1.046	.072
Aggression	671	.44	.772	1.839	2.746
Oppositionality	670	.38	.710	2.012	3.657
Deceitfulness	668	.38	.679	2.004	4.071
Impulsivity	669	1.15	.939	.444	-.677
Distractibility	668	1.29	1.023	.289	-1.037
Recklessness	667	1.13	.982	.449	-.835
Irresponsibility	668	.41	.774	2.005	3.357
Perfectionism	668	1.41	1.024	.109	-1.115
Perseveration	666	1.03	.985	.537	-.830
Rigidity	668	.88	.892	.733	-.316
Orderliness	668	1.21	.994	.398	-.880
Risk Aversion	663	.75	.826	.888	.067
Unusual Perceptions	667	.31	.690	2.370	5.071

Table 20 (continued). *Descriptive Statistics for Combined Student-Report and Client-Current-Report BAT37 Data*

BAT37 Trait	*N*	Mean	*SD*	Skewness	Kurtosis
Unusual Beliefs	666	.50	.834	1.608	1.662
Eccentricity	666	.30	.641	2.375	5.692
Cognitive Dysregulation	664	.62	.903	1.363	.830
Dissociation Proneness	666	.41	.759	1.884	2.816

Table 21. *Descriptive Statistics for the PAI*

PAI Scale	*N*	Mean	*SD*
ICN	207	51.01	8.035
INF	207	50.22	7.911
NIM	207	50.31	8.711
PIM	207	46.77	11.917
SOM	207	52.72	10.472
SOM-C	207	51.16	10.738
SOM-S	207	51.73	11.343
SOM-H	207	53.76	9.969
ANX	207	55.19	13.635
ANX-C	207	55.93	13.331
ANX-A	207	54.66	13.491
ANX-P	207	53.34	12.689
ARD	207	53.40	12.603
ARD-O	207	50.03	10.600
ARD-P	207	49.79	10.454

Table 21 (continued). *Descriptive Statistics for the PAI*

PAI Scale	*N*	Mean	*SD*
ARD-T	207	57.00	14.512
DEP	207	57.48	14.492
DEP-C	207	54.47	13.006
DEP-A	207	58.05	14.797
DEP-P	207	56.23	12.931
MAN	207	47.43	10.259
MAN-A	207	47.22	11.658
MAN-G	207	47.82	9.394
MAN-I	207	48.92	10.513
PAR	207	47.82	10.332
PAR-H	207	48.12	11.090
PAR-P	207	47.74	10.157
PAR-R	207	48.47	9.621
SCZ	207	48.13	11.578
SCZ-P	207	43.60	8.731
SCZ-S	207	50.29	11.458
SCZ-T	207	50.92	13.229
BOR	207	56.65	14.152
BOR-A	207	53.64	12.511
BOR-I	207	54.92	12.732
BOR-N	207	56.21	12.333
BOR-S	207	56.84	15.708

Table 21 (continued). *Descriptive Statistics for the PAI*

PAI Scale	*N*	Mean	*SD*
ANT	207	55.41	13.504
ANT-A	207	59.47	12.398
ANT-E	207	49.73	12.011
ANT-S	207	52.35	12.998
ALC	207	68.03	20.690
DRG	207	71.51	21.661
AGG	207	49.59	12.151
AGG-A	207	50.11	12.261
AGG-V	207	48.14	9.999
AGG-P	207	50.72	12.972
SUI	207	52.02	13.326
STR	207	57.49	12.292
NON	207	47.58	9.936
RXR	207	38.73	11.838
DOM	207	48.85	9.832
WRM	207	51.36	10.696

Table 22. *Descriptive Statistics for the DAPP-BQ*

DAPP-BQ Scale	*N*	Mean	*SD*
Affective Lability	145	48.27	11.460
Anxiousness	145	53.05	11.138

Table 22 (continued). *Descriptive Statistics for the DAPP-BQ*

DAPP-BQ Scale	*N*	Mean	*SD*
Callousness	145	48.57	11.535
Compulsivity	145	48.28	9.218
Conduct Problems	145	54.85	11.833
Cognitive Dysregulation	145	45.67	8.871
Identity Problems	145	52.97	10.780
Insecure Attachment	145	49.88	10.516
Intimacy Problems	145	49.91	8.989
Low Affiliation	145	50.12	11.189
Narcissism	145	50.89	10.728
Oppositionality	145	52.56	15.879
Rejection	145	50.65	10.722
Restricted Expression	145	48.77	9.997
Stimulus Seeking	145	50.44	14.007
Submissiveness	145	48.85	9.862
Suspiciousness	145	49.99	10.477

Table 23. *Descriptive Statistics for the HEXACO-PI-R*

HEXACO-PI-R Scale	*N*	Mean	*SD*
Honesty-Humility	165	47.76	12.225
Sincerity	165	49.73	12.680
Fairness	165	47.39	12.884
Greed Avoidance	165	45.89	11.295

Table 23 (continued). *Descriptive Statistics for the HEXACO-PI-R*

HEXACO-PI-R Scale	*N*	Mean	*SD*
Modesty	165	50.29	10.731
Emotionality	165	52.88	9.761
Fearfulness	165	48.60	10.168
Anxiety	165	53.13	11.278
Dependence	165	55.06	8.856
Sentimentality	165	50.63	9.435
Extraversion	165	54.51	10.918
Social Self-Esteem	165	63.43	10.217
Social Boldness	165	49.96	9.125
Sociability	165	53.49	10.309
Liveliness	165	45.94	12.813
Agreeableness	165	51.95	11.144
Forgiveness	165	55.01	10.682
Gentleness	165	52.20	9.731
Flexibility	165	50.46	9.931
Patience	165	48.17	12.144
Conscientiousness	165	45.80	12.704
Organization	165	46.65	11.212
Diligence	165	49.48	11.240
Perfectionism	165	48.85	10.837
Prudence	165	42.93	14.540
Openness to Experience	165	48.54	9.388

Table 23 (continued). *Descriptive Statistics for the HEXACO-PI-R*

HEXACO-PI-R Scale	*N*	Mean	*SD*
Aesthetic Appreciation	165	48.43	11.245
Inquisitiveness	165	48.82	9.883

Mann-Whitney U tests were conducted to examine gender differences in client-current-report BAT37 data (see Table 24). Some participants were excluded from these tests based on the aforementioned PAI-related criteria. After removing participants, these analyses included 110 males (53%) and 97 females (47%). Statistically significant gender differences were found for only 4 of the 37 traits. Males were indicated to report higher levels of *Restricted Affectivity* ($Z = -3.506$, $p = .000$) and females were indicated to report higher levels of *Anxiousness* ($Z = -2.056$, $p = .040$), *Depressivity* ($Z = -2.141$, $p = .032$), and *Social Detachment* ($Z = -2.840$, $p = .005$).

Table 24. *Gender Differences in Client-Current-Report BAT37 Data*

	Mann-Whitney U Test	
BAT37 Trait	*Z*	Sig. (2-tailed)
Emotional Lability	-1.118[b]	.264
Anxiousness	-2.056[b]	.040
Submissiveness	-1.711[b]	.087
Separation Insecurity	-1.018[a]	.309
Pessimism	-.573[a]	.567
Low Self-Esteem	-1.923[b]	.054
Guilt/Shame	-1.401[b]	.161

Table 24 (continued). *Gender Differences in Client-Current-Report BAT37 Data*

BAT37 Trait	Mann-Whitney U Test	
	Z	Sig. (2-tailed)
Self-Harm	-.247[a]	.805
Depressivity	-2.141[b]	.032
Suspiciousness	-.140[a]	.889
Social Withdrawal	-1.267[a]	.205
Social Detachment	-2.840[b]	.005
Intimacy Avoidance	-.337[a]	.736
Restricted Affectivity	-3.506[a]	.000
Anhedonia	-.117[a]	.907
Callousness	-.201[b]	.841
Manipulativeness	-.460[a]	.646
Narcissism	-1.411[a]	.158
Histrionism	-.640[b]	.522
Hostility	-.723[b]	.469
Aggression	-.903[a]	.367
Oppositionality	-1.384[a]	.166
Deceitfulness	-.764[a]	.445
Impulsivity	-.581[a]	.561
Distractibility	-.832[b]	.405
Recklessness	-.772[a]	.440
Irresponsibility	-.065[b]	.948
Perfectionism	-.335[a]	.738

Table 24 (continued). *Gender Differences in Client-Current-Report BAT37 Data*

	Mann-Whitney U Test	
BAT37 Trait	*Z*	Sig. (2-tailed)
Perseveration	-.033[a]	.974
Rigidity	-.632[a]	.527
Orderliness	-1.187[b]	.235
Risk Aversion	-1.780[b]	.075
Unusual Perceptions	-.461[b]	.645
Unusual Beliefs	-1.374[a]	.169
Eccentricity	-1.254[a]	.210
Cognitive Dysregulation	-.139[a]	.889
Dissociation Proneness	-.072[b]	.943

Note. [a] Males with higher sum of ranks. [b] Females with higher sum of ranks.

Hypothesis Set One

To examine the construct validity of the BAT37, polyserial correlations between client-current-report BAT37 traits and theoretically-related scales from the PAI, DAPP-BQ, and HEXACO-PI-R (refer to Table 3) – excluding participants who did not complete the PAI or produced *t*-scores on the PAI's *PIM* scale which were greater than or equal to 68 – were analyzed using Mplus version 6.11 (Muthén & Muthén, 2010). All of the resultant correlation coefficients were in the hypothesized direction. The strength of the correlation coefficients ranged from r_{ps} = .147 to r_{ps} = .807. Of the 113 correlations examined, 97 of them (85.85%) produced strengths greater than r_{ps} = .400. Each polyserial correlation coefficient between variables which were predicted to be strongly

correlated is listed in Table 25. Overall, the predictions made in Hypothesis Set One and the construct validity of the BAT37 were supported by these findings.

Table 25. *Polyserial Correlation Coefficients Between Specific BAT37 Traits and Theoretically-Related Scales From the PAI, DAPP-BQ, and HEXACO-PI-R*

BAT37 Trait / Related Scale (test)	*N*	r_{ps}
Emotional Lability / *BOR-A* (PAI)	207	.731***
Emotional Lability / *Affective Lability* (DAPP-BQ)	131	.659***
Anxiousness / *ANX* (PAI)	207	.766***
Anxiousness / *ANX-C* (PAI)	207	.730***
Anxiousness / *ANX-A* (PAI)	207	.739***
Anxiousness / *ANX-P* (PAI)	207	.662***
Anxiousness / *Anxiety* (DAPP-BQ)	131	.653***
Anxiousness / *Anxiety* (HEXACO-PI-R)	147	.737***
Anxiousness / (-) *Social Self-Esteem* (HEXACO-PI-R)	147	-.539***
Submissiveness / *Submissiveness* (DAPP-BQ)	131	.567***
Submissiveness / (-) *Social Boldness* (HEXACO-PI-R)	147	-.490***
Separation Insecurity / *Insecure Attachment* (DAPP-BQ)	131	.462***
Pessimism / *DEP-C* (PAI)	207	.452***
Low Self-Esteem / (-) *Social Self-Esteem* (HEXACO-PI-R)	147	-.741***
Guilt/Shame / *DEP-C* (PAI)	207	.673***
Self-Harm / *SUI* (PAI)	207	.688***
Depressivity / *DEP* (PAI)	207	.728***
Depressivity / *DEP-C* (PAI)	207	.641***
Depressivity / *DEP-A* (PAI)	207	.757***

Table 25 (continued). *Polyserial Correlation Coefficients Between Specific BAT37 Traits and Theoretically-Related Scales From the PAI, DAPP-BQ, and HEXACO-PI-R*

BAT37 Trait / Related Scale (test)	*N*	r_{ps}
Depressivity / *DEP-P* (PAI)	207	.555***
Depressivity / (-) *Liveliness* (HEXACO-PI-R)	147	-.665***
Suspiciousness / *PAR* (PAI)	207	.509***
Suspiciousness / *Suspiciousness* (DAPP-BQ)	131	.537***
Social Withdrawal / *SCZ-S* (PAI)	207	.675***
Social Withdrawal / *Low Affiliation* (DAPP-BQ)	131	.563***
Social Withdrawal / (-) *Extraversion* (HEXACO-PI-R)	147	-.696***
Social Withdrawal / (-) *Social Boldness* (HEXACO-PI-R)	147	-.543***
Social Withdrawal / (-) *Sociability* (HEXACO-PI-R)	147	-.669***
Social Detachment / *SCZ-S* (PAI)	207	.442***
Social Detachment / *Low Affiliation* (DAPP-BQ)	131	.504***
Social Detachment / (-) *Extraversion* (HEXACO-PI-R)	147	-.580***
Social Detachment / (-) *Sociability* (HEXACO-PI-R)	147	-.387***
Intimacy Avoidance / *Intimacy Problems* (DAPP-BQ)	131	.246*
Intimacy Avoidance / (-) *Dependence* (HEXACO-PI-R)	147	-.147[a]
Intimacy Avoidance / (-) *Extraversion* (HEXACO-PI-R)	147	-.486***
Restricted Affectivity / *Restricted Expression* (DAPP-BQ)	131	.585***
Restricted Affectivity / (-) *Liveliness* (HEXACO-PI-R)	147	-.263**
Anhedonia / (-) *Liveliness* (HEXACO-PI-R)	147	-.649***
Callousness / *ANT-E* (PAI)	207	.467***
Callousness / *Callousness* (DAPP-BQ)	131	.463***
Callousness / (-) *Sentimentality* (HEXACO-PI-R)	147	-.442***

Table 25 (continued). *Polyserial Correlation Coefficients Between Specific BAT37 Traits and Theoretically-Related Scales From the PAI, DAPP-BQ, and HEXACO-PI-R*

BAT37 Trait / Related Scale (test)	*N*	r_{ps}
Callousness / (-) *Agreeableness* (HEXACO-PI-R)	147	-.442***
Callousness / (-) *Forgiveness* (HEXACO-PI-R)	147	-.346**
Callousness / (-) *Altruism* (HEXACO-PI-R)	147	-.528***
Manipulativeness / *ANT-E* (PAI)	207	.611***
Manipulativeness / (-) *Honesty-Humility* (HEXACO-PI-R)	147	-.571***
Manipulativeness / (-) *Sincerity* (HEXACO-PI-R)	147	-.586***
Manipulativeness / (-) *Fairness* (HEXACO-PI-R)	147	-.466***
Narcissism / *ANT-E* (PAI)	207	.474***
Narcissism / *Narcissism* (DAPP-BQ)	131	.566***
Narcissism / (-) *Modesty* (HEXACO-PI-R)	147	-.537***
Histrionism / *Narcissism* (DAPP-BQ)	131	.642***
Histrionism / (-) *Greed Avoidance* (HEXACO-PI-R)	147	-.351***
Histrionism / (-) *Modesty* (HEXACO-PI-R)	147	-.565***
Hostility / *MAN-I* (PAI)	207	.557***
Hostility / *Rejection* (DAPP-BQ)	131	.408***
Hostility / (-) *Agreeableness* (HEXACO-PI-R)	147	-.707***
Hostility / (-) *Forgiveness* (HEXACO-PI-R)	147	-.451***
Hostility / (-) *Gentleness* (HEXACO-PI-R)	147	-.487***
Hostility / (-) *Patience* (HEXACO-PI-R)	147	-.807***
Aggression / *AGG* (PAI)	207	.702***
Aggression / *AGG-A* (PAI)	207	.667***
Aggression / *AGG-V* (PAI)	207	.550***

Table 25 (continued). *Polyserial Correlation Coefficients Between Specific BAT37 Traits and Theoretically-Related Scales From the PAI, DAPP-BQ, and HEXACO-PI-R*

BAT37 Trait / Related Scale (test)	*N*	r_{ps}
Aggression / *AGG-P* (PAI)	207	.629***
Aggression / (-) *Agreeableness* (HEXACO-PI-R)	147	-.622***
Aggression / (-) *Gentleness* (HEXACO-PI-R)	147	-.507***
Oppositionality / *Oppositionality* (DAPP-BQ)	131	.425***
Oppositionality / *Rejection* (DAPP-BQ)	131	.259**
Oppositionality / (-) *Agreeableness* (HEXACO-PI-R)	147	-.445***
Deceitfulness / (-) *Honesty-Humility* (HEXACO-PI-R)	147	-.428***
Deceitfulness / (-) *Sincerity* (HEXACO-PI-R)	147	-.440***
Deceitfulness / (-) *Fairness* (HEXACO-PI-R)	147	-.381***
Impulsivity / *BOR-S* (PAI)	207	.676***
Impulsivity / *Stimulus Seeking* (DAPP-BQ)	131	.638***
Impulsivity / (-) *Conscientiousness* (HEXACO-PI-R)	147	-.493***
Impulsivity / (-) *Prudence* (HEXACO-PI-R)	147	-.699***
Distractibility / *SCZ-T* (PAI)	207	.687***
Distractibility / *Oppositionality* (DAPP-BQ)	131	.598***
Distractibility / (-) *Conscientiousness* (HEXACO-PI-R)	147	-.526***
Recklessness / *MAN-A* (PAI)	207	.463***
Recklessness / *BOR-S* (PAI)	207	.643***
Recklessness / *ANT-S* (PAI)	207	.757***
Recklessness / *Stimulus Seeking* (DAPP-BQ)	131	.663***
Recklessness / *Conduct Problems* (DAPP-BQ)	131	.540***
Recklessness / (-) *Conscientiousness* (HEXACO-PI-R)	147	-.462***

Table 25 (continued). *Polyserial Correlation Coefficients Between Specific BAT37 Traits and Theoretically-Related Scales From the PAI, DAPP-BQ, and HEXACO-PI-R*

BAT37 Trait / Related Scale (test)	*N*	r_{ps}
Recklessness / (-) *Prudence* (HEXACO-PI-R)	147	-.460***
Irresponsibility / *ANT-A* (PAI)	207	.559***
Irresponsibility / *Conduct Problems* (DAPP-BQ)	131	.526***
Irresponsibility / *Oppositionality* (DAPP-BQ)	131	.601***
Irresponsibility / (-) *Conscientiousness* (HEXACO-PI-R)	147	-.664***
Irresponsibility / (-) *Diligence* (HEXACO-PI-R)	147	-.626***
Perfectionism / *ARD-O* (PAI)	207	.531***
Perfectionism / *Compulsivity* (DAPP-BQ)	131	.493***
Perfectionism / *Conscientiousness* (HEXACO-PI-R)	147	.381***
Perfectionism / *Organization* (HEXACO-PI-R)	147	.322***
Perfectionism / *Perfectionism* (HEXACO-PI-R)	147	.510***
Perseveration / (-) *Flexibility* (HEXACO-PI-R)	147	-.317***
Rigidity / *ARD-O* (PAI)	207	.335***
Rigidity / (-) *Flexibility* (HEXACO-PI-R)	147	-.562***
Orderliness / *ARD-O* (PAI)	207	.613***
Orderliness / *Compulsivity* (DAPP-BQ)	131	.680***
Orderliness / *Conscientiousness* (HEXACO-PI-R)	147	.375***
Orderliness / *Organization* (HEXACO-PI-R)	147	.421***
Orderliness / *Perfectionism* (HEXACO-PI-R)	147	.381***
Risk Aversion / (-) *ANT-S* (PAI)	207	-.279***
Risk Aversion / (-) *Stimulus Seeking* (DAPP-BQ)	131	-.247**
Unusual Perceptions / *SCZ-P* (PAI)	207	.400***

Table 25 (continued). *Polyserial Correlation Coefficients Between Specific BAT37 Traits and Theoretically-Related Scales From the PAI, DAPP-BQ, and HEXACO-PI-R*

BAT37 Trait / Related Scale (test)	*N*	r_{ps}
Unusual Beliefs / *SCZ-P* (PAI)	207	.668***
Eccentricity / *Unconventionality* (HEXACO-PI-R)	147	.585***
Cognitive Dysregulation / *SCZ-T* (PAI)	207	.682***
Cognitive Dysregulation / *Cognitive Dysregulation* (DAPP-BQ)	131	.568***
Cognitive Dysregulation / *Oppositionality* (DAPP-BQ)	131	.559***
Dissociation Proneness / *Cognitive Dysregulation* (DAPP-BQ)	131	.651***

Note. * $p < .05$. ** $p < .01$. *** $p < .001$. [a] $p = .114$.

Hypothesis Set Two

Descriptive statistics of response data from the client-before-report BAT37 (refer to Table 19) were used to explore traits which precede SUDs. Means for self-reported BAT37 traits prior to the onset of regular substance use ranged from .18 to 1.55, with *Unusual Perceptions* representing the lowest mean and *Impulsivity* representing the highest mean. Subsequent highest means on the client-before-report BAT37, in descending order, were represented by the following traits: *Anxiousness* ($M = 1.53$), *Recklessness* ($M = 1.45$), *Distractibility* ($M = 1.36$), *Separation Insecurity* ($M = 1.33$), *Perfectionism* ($M = 1.31$), *Emotional Lability* ($M = 1.31$), *Rigidity* ($M = 1.27$), *Perseveration* ($M = 1.26$), *Guilt/Shame* ($M = 1.25$), *Low Self-Esteem* ($M = 1.20$), *Depressivity* ($M = 1.17$), *Hostility* ($M = 1.13$), *Submissiveness* ($M = 1.10$), and *Irresponsibility* ($M = 1.10$). The prediction that BAT37 traits related to the broad construct of psychological dysregulation (Clark & Winters, 2002; Thatcher & Clark, 2010) – specifically, *Emotional Lability*, *Anxiousness*, *Self-Harm*, *Depressivity*, *Hostility*,

Aggression, *Impulsivity*, *Distractibility*, *Recklessness*, and *Irresponsibility* – would be indicated to precede SUDs was supported for all traits except *Self-Harm* and *Aggression*. The prediction that the BAT37 traits comprising the initially proposed *DSM-5* trait domains of introversion, compulsivity, and schizotypy would be rarely indicated to precede SUDs was supported regarding introversion and schizotypy but refuted regarding compulsivity.

To examine the relationship between age of onset of SUDs and traits which precede SUDs, polyserial correlations between client-before-report BAT37 data and self-reported age prior to the onset of regular substance use were analyzed (see Table 26). Most traits (29 of 37) assessed by the client-before-report BAT37 were negatively correlated with this age. BAT37 traits most strongly related to age prior to regular substance use include *Unusual Beliefs* ($r_{ps} = -.528, p < .001$), *Unusual Perceptions* ($r_{ps} = -.481, p < .001$), *Eccentricity* ($r_{ps} = -.427, p < .001$), *Irresponsibility* ($r_{ps} = -.419, p < .001$), and *Recklessness* ($r_{ps} = -.415, p < .001$).

Table 26. *Polyserial Correlations Between Self-Reported Age Prior to Regular Substance Use and Client-Before-Report BAT37 Data*

BAT37 Trait	*N*	r_{ps}
Emotional Lability	146	-.189*
Anxiousness	147	-.035[a]
Submissiveness	146	-.357***
Separation Insecurity	146	-.250**
Pessimism	146	-.018[a]

Table 26 (continued). *Polyserial Correlations Between Self-Reported Age Prior to Regular Substance Use and Client-Before-Report BAT37 Data*

BAT37 Trait	*N*	r_{ps}
Low Self-Esteem	146	-.122[a]
Guilt/Shame	146	.002[a]
Self-Harm	146	.005[a]
Depressivity	142	-.085[a]
Suspiciousness	143	-.077[a]
Social Withdrawal	143	.042[a]
Social Detachment	143	-.121[a]
Intimacy Avoidance	143	.041[a]
Restricted Affectivity	142	-.120[a]
Anhedonia	143	.027[a]
Callousness	143	-.214[a]
Manipulativeness	143	-.243**
Narcissism	143	-.204*
Histrionism	143	-.343***
Hostility	143	-.100[a]
Aggression	143	-.128[a]
Oppositionality	143	-.382***
Deceitfulness	143	-.242*
Impulsivity	143	-.286**

Table 26 (continued). *Polyserial Correlations Between Self-Reported Age Prior to Regular Substance Use and Client-Before-Report BAT37 Data*

BAT37 Trait	*N*	r_{ps}
Distractibility	142	-.235**
Recklessness	143	-.415***
Irresponsibility	143	-.419***
Perfectionism	142	.136[a]
Perseveration	143	-.040[a]
Rigidity	143	-.152[a]
Orderliness	142	.177*
Risk Aversion	143	.083[a]
Unusual Perceptions	143	-.481***
Unusual Beliefs	143	-.528***
Eccentricity	143	-.427***
Cognitive Dysregulation	143	-.369***
Dissociation Proneness	143	-.363***

Note. * $p < .05$. ** $p < .01$. *** $p < .001$.
[a] not significant at $p < .05$.

Hypothesis Set Three

A two-step process, in which an exploratory factor analysis was followed by a hierarchical cluster analysis using the resulting factors, was used to explore potential

personality-based typologies of individuals with SUDs. First, data from the student-report BAT37 (n = 433) and the client-current-report BAT37 (n = 240) were combined (n = 673) and factor analyzed. An exploratory factor analysis of a polychoric correlation matrix was conducted using Mplus version 6.11 (Muthén & Muthén, 2010). A promax rotation and a weighted least squares (mean and variance adjusted) estimation method were selected for the factor analysis because various combinations of alternative rotations and estimation methods yielded uninterpretable or less interpretable factor loadings. It was decided to retain five factors, primarily based on Cattell's (1966) scree test criterion (see Figure 1).

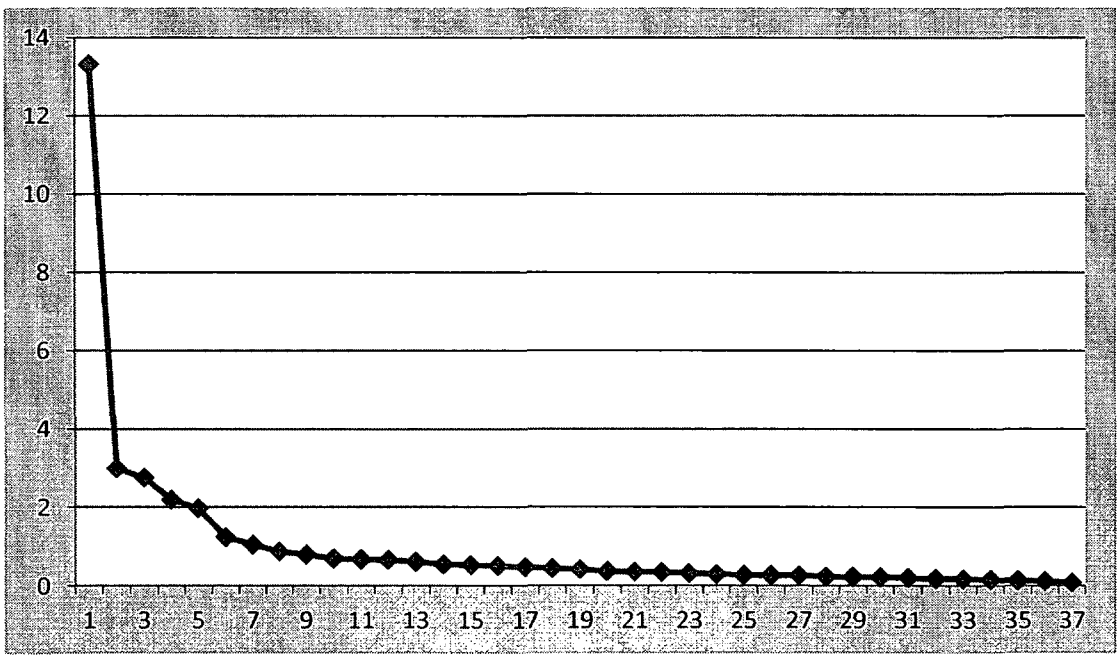


Figure 1. Scree Plot From Exploratory Factor Analysis of Combined Student-Report and Client-Current-Report BAT37 Data.

BAT37 traits with pattern matrix loadings of less than .40 and/or with differences in cross-loadings of less than the absolute value of .10 were omitted, resulting in the removal of the following traits: *Suspiciousness*, *Anhedonia*, *Distractibility*,

Irresponsibility, and *Perseveration*. A subsequent exploratory factor analysis with a promax rotation and a weighted least squares (mean and variance adjusted) estimation method was conducted without these five BAT37 traits. Promax rotated loadings and communalities for each BAT37 trait in the accepted five factor solution are presented in Table 27. The five factors were titled *Negative Affectivity* (factor 1), *Antagonism* (factor 2), *Detachment* (factor 3), *Compulsivity* (factor 4), and *Psychoticism* (factor 5). Correlations between these factors are presented in Table 28.

Table 27. *Promax Rotated Loadings and Communalities for Combined Student-Report and Client-Current-Report BAT37 Data*

	Promax Rotated Loadings					
BAT37 Trait	1	2	3	4	5	Communality
Emotional Lability	**.553**	.246	.235	.258	.059	.572
Anxiousness	**.814**	-.092	.141	.220	.089	.676
Submissiveness	**.541**	-.147	-.150	-.069	.027	.315
Separation Insecurity	**.562**	.083	.108	-.110	-.009	.331
Pessimism	**.539**	.176	-.133	.033	-.023	.478
Low Self-Esteem	**.893**	-.027	-.094	-.092	-.075	.776
Guilt/Shame	**.825**	-.014	-.063	-.017	-.015	.696
Self-Harm	**.517**	.153	-.146	.026	.049	.486
Depressivity	**.795**	.036	-.134	-.057	-.083	.684
Social Withdrawal	.260	-.034	**-.686**	.060	.089	.709
Social Detachment	.350	.047	**-.581**	-.062	.120	.713
Intimacy Avoidance	.152	.214	**-.517**	-.002	.073	.516
Restricted Affectivity	-.204	.105	**-.652**	-.055	.186	.484
Callousness	-.168	**.622**	-.301	.042	.157	.576

Table 27 (continued). *Promax Rotated Loadings and Communalities for Combined Student-Report and Client-Current-Report BAT37 Data*

BAT37 Trait	Promax Rotated Loadings					Communality
	1	2	3	4	5	
Manipulativeness	.079	**.751**	-.148	-.107	-.136	.597
Narcissism	.008	**.826**	-.181	.013	-.275	.619
Histrionism	-.123	**.760**	.098	.096	-.070	.473
Hostility	.187	**.561**	.149	.272	.094	.585
Aggression	-.037	**.766**	.004	.125	.068	.640
Oppositionality	.123	**.623**	-.141	-.134	.055	.590
Deceitfulness	.319	**.439**	-.145	-.085	.020	.518
Impulsivity	.148	**.460**	.252	-.224	.299	.553
Recklessness	-.041	**.554**	.174	-.281	.372	.648
Perfectionism	-.043	.196	-.006	**.668**	.017	.496
Rigidity	-.016	**.643**	-.074	.261	-.015	.519
Orderliness	-.039	.043	.075	**.811**	.073	.650
Risk Aversion	.181	-.177	-.292	**.454**	-.079	.362
Unusual Perceptions	-.098	-.031	-.046	.216	**.802**	.601
Unusual Beliefs	-.036	.008	-.153	.035	**.845**	.783
Eccentricity	-.087	-.001	-.112	.015	**.852**	.724
Cognitive Dysregulation	.174	-.055	-.080	-.093	**.730**	.688
Dissociation Proneness	.294	-.098	-.164	-.005	**.653**	.708

A hierarchical cluster analysis was then carried out on the factor scores of client-current-report BAT37 data using PASW Statistics 18 (SPSS Inc., 2009). Factor scores

were calculated by adding together the raw scores of the BAT37 traits that comprise each factor, and were transformed to *z*-scores to account for the scale differences between factors. Participants who either did not complete the PAI or produced *t*-scores on the PAI's *PIM* scale that were equal to or greater than 68 were excluded from the cluster analysis. Six additional BAT37 client-current-report respondents were removed from the analysis because they had missing values on at least one of the traits comprising the factor scores, decreasing the number of participants to 201. Ward's method was selected as the linkage algorithm and squared Euclidian distance was selected as the distance measure because various combinations of alternative linkage algorithms and distance measures, as well as factor standardization options, produced uninterpretable or less interpretable results. A scree plot (see Figure 2) derived from the resulting coefficients in the agglomeration schedule, in which the number of clusters was represented on the x-axis and the proximity between clusters was represented on the y-axis, was used in addition to examination of a dendrogram (see Figure 3) to determine the appropriate number of clusters to select (Mooi & Sarstedt, 2011). Support was indicated for the existence of two, three, and five discrete clusters.

Table 28. *Factor Correlations*

Factor	1	2	3	4	5
1. Negative Affectivity	-				
2. Antagonism	.480	-			
3. Detachment	-.331	-.208	-		
4. Compulsivity	.097	.082	-.079	-	
5. Psychoticism	.429	.476	-.268	-.077	-

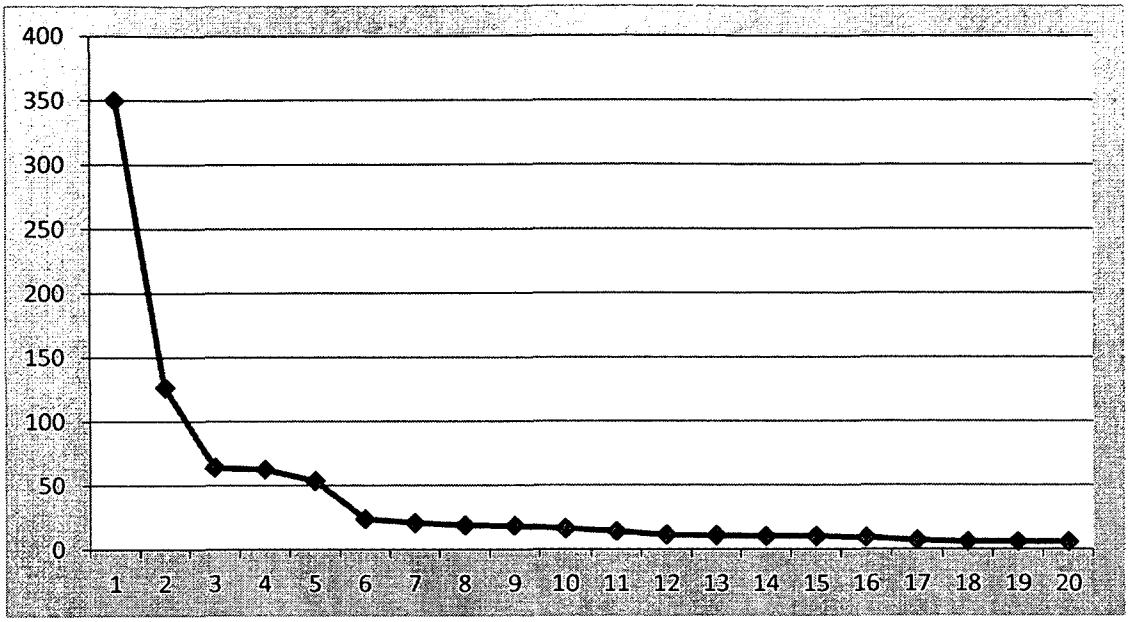


Figure 2. Scree Plot From Hierarchical Cluster Analysis.

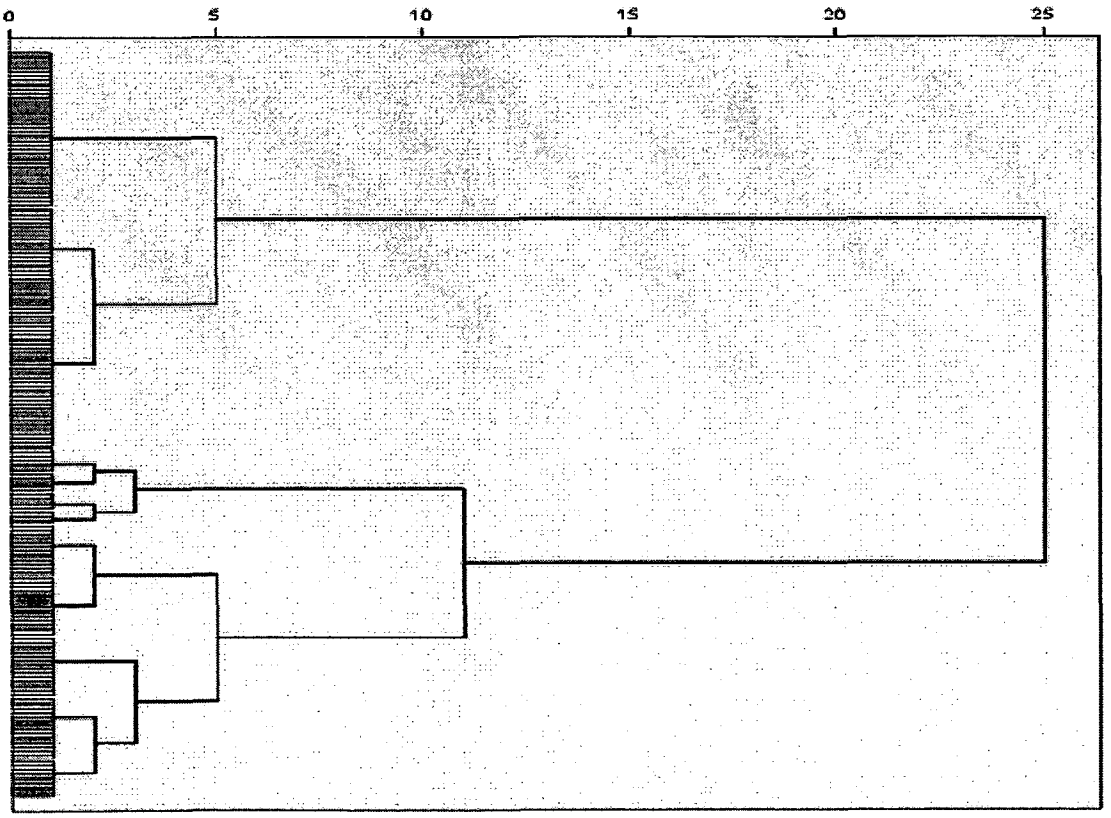


Figure 3. Dendrogram From Hierarchical Cluster Analysis.

The validity of the two, three, and five cluster solutions was examined by conducting three *k*-means cluster analyses on the same data, with two, three, and five clusters specified for each of these analyses (Henry, Tolan, & Gorman-Smith, 2005; Mooi & Sarstedt, 2011). For the five-cluster solution, 186 out of the 201 cases were classified differently (7.46% agreement) in a *k*-means cluster analysis, suggesting that the classification of five distinct groups poorly fit the data. For the two-cluster solution, 27 out of the 201 cases were classified differently (86.57% agreement) in a *k*-means cluster analysis; and for the three-cluster solution, 14 out of the 201 cases were classified differently (93.03% agreement) in a *k*-means cluster analysis. As such, the arrangement of three discrete clusters demonstrated the strongest validity and was deemed the best-supported solution.

The factor *z*-scores and other notable descriptors of each cluster are presented in Table 29. In the aforementioned two cluster solution, the cases in Clusters 2 and 3 were combined. With the exceptions of gender distribution and *z*-scores on the Compulsivity factor, differences between the three clusters were consistently indicated to be quantitative rather than qualitative. Cluster 1, the largest of the three clusters ($n = 107$), was characterized by relatively older respondents ($M = 42.50$), who reported that they began using drugs at relatively older ages ($M = 28.12$) and described themselves as having the lowest levels of pathology as compared to the other two groups. Cluster 3, the smallest of the three clusters ($n = 21$), was characterized by relatively younger respondents ($M = 31.05$) who reported that they began using drugs at relatively younger ages ($M = 19.00$) and described themselves as having the highest levels of pathology. Cluster 2 was generally indicated to be intermediate in each of these areas.

Table 29. *Descriptive Statistics for Each of the Three Clusters From the Hierarchical Cluster Analysis*

Variable	Cluster 1	Cluster 2	Cluster 3
N	107	73	21
Negative Affectivity (*z*-score)	-.729	.644	1.309
Antagonism (*z*-score)	-.618	.443	1.519
Detachment (*z*-score)	-.640	.602	1.108
Compulsivity (*z*-score)	-.207	.371	-.203
Psychoticism (*z*-score)	-.448	-.092	2.478
Age (*M*)	42.50	38.70	31.05
Gender (*N*)			
Male	60	31	16
Female	47	42	5
PAI *PIM* Scale *t*-score (*M*)	54.336	40.000	34.143
PAI *NIM* Scale *t*-score (*M*)	46.215	52.397	61.762
PAI *ALC* Scale *t*-score (*M*)	60.252	76.356	79.857
PAI *DRG* Scale *t*-score (*M*)	60.654	79.945	97.238
Age Before Regular Use (*M*)	28.120 ($n = 59$)	25.000 ($n = 64$)	19.00 ($n = 21$)

Particularly given the inverse linear relationships of the *PIM* and *NIM* scales to the clusters, the results of the hierarchical cluster analysis suggest that the three identified groups are more reflective of scalar differences in individuals' response styles, or individuals' willingness to endorse the presence of pathology in themselves, than three distinct personality types. To scrutinize this possibility, an additional hierarchical cluster analysis – with the same linkage algorithm, distance measure, and variable

standardization – was conducted on client-current-report BAT37 data with all cases removed that had PAI *PIM* and/or *NIM* *t*-scores below 40 or above 60. The analysis included 117 participants. A scree plot and dendrogram suggested the existence of three clusters. The validity of the clusters was not well-supported – a subsequent *k*-means cluster analysis produced less than 41.03% agreement with the hierarchical cluster analysis – but observation of the descriptive statistics from the hierarchical cluster analysis indicated that the clusters were divided based on the same trends as the hierarchical cluster analysis without the *PIM* and *NIM* restrictions. The finding that clusters were derived from response styles rather than personality configurations supported the hypothesis that individual differences are more pronounced than group differences in attempting to classify individuals with SUDs.

Hypothesis Set Four

To explore changes in personality traits in the period between non-problematic substance use and SUDs, Wilcoxon signed ranks tests were conducted between client-current-report BAT37 traits and corresponding client-before-report BAT37 traits. The following BAT37 traits were indicated to demonstrate a statistically significant increase in participants following the onset of regular substance use: *Separation Insecurity* ($Z = -2.617, p = .009$), *Depressivity* ($Z = -2.441, p = .015$), *Callousness* ($Z = -3.719, p = .000$), *Narcissism* ($Z = -2.310, p = .021$), *Histrionism* ($Z = -3.487, p = .000$), *Hostility* ($Z = -3.648, p = .000$), *Oppositionality* ($Z = -3.622, p = .000$), *Deceitfulness* ($Z = -4.188, p = .000$), *Impulsivity* ($Z = -3.272, p = .001$), *Recklessness* ($Z = -4.472, p = .000$), *Irresponsibility* ($Z = -2.205, p = .027$), *Rigidity* ($Z = -3.975, p = .000$), and *Eccentricity*

($Z = -3.073, p = .002$). The BAT37 trait of *Perfectionism* ($Z = -2.120, p = .034$) was indicated to demonstrate a statistically significant decrease in participants following the onset of regular substance use (see Table 30). These findings were largely supportive of the hypothesis that traits related to disinhibition would be quantitatively stronger following the onset of SUDs, as half of the traits suggested to be related to disinhibition demonstrated an increase after initiation of regular substance use; and, more generally, were consistent with the hypothesis that personality pathology would be suggested to have increased along with substance use.

Table 30. *Mean Differences Between Client-Before-Report BAT37 Data and Client-Current-Report BAT37 Data*

BAT37 Trait	Wilcoxon Signed Ranks Test	
(Before – Current)	*Z*	Sig. (2-tailed)
Emotional Lability	-.891[a]	.373
Anxiousness	-.350[a]	.727
Submissiveness	-2.011[a]	.044
Separation Insecurity	-2.617[a]	.009
Pessimism	-.129[b]	.897
Low Self-Esteem	-1.687[a]	.092
Guilt/Shame	-1.404[b]	.160
Self-Harm	-.296[b]	-767
Depressivity	-2.441[a]	.015
Suspiciousness	-1.447[a]	.148
Social Withdrawal	-.195[b]	.845
Social Detachment	-.482[a]	.630

Table 30 (continued). *Mean Differences Between Client-Before-Report BAT37 Data and Client-Current-Report BAT37 Data*

BAT37 Trait	Wilcoxon Signed Ranks Test	
(Before – Current)	*Z*	Sig. (2-tailed)
Intimacy Avoidance	-.467[a]	.641
Restricted Affectivity	-.443[a]	.657
Anhedonia	-.130[a]	.897
Callousness	-3.719[a]	.000
Manipulativeness	-.342[a]	.733
Narcissism	-2.310[a]	.021
Histrionism	-3.487[a]	.000
Hostility	-3.648[a]	.000
Aggression	-1.508[a]	.132
Oppositionality	-3.622[a]	.000
Deceitfulness	-4.188[a]	.000
Impulsivity	-3.272[a]	.001
Distractibility	-.538[a]	.591
Recklessness	-4.472[a]	.000
Irresponsibility	-2.205[a]	.027
Perfectionism	-2.120[b]	.034
Perseveration	-.809[b]	.419
Rigidity	-3.975[a]	.000
Orderliness	-.215[b]	.830
Risk Aversion	-1.376[b]	.169

Table 30 (continued). *Mean Differences Between Client-Before-Report BAT37 Data and Client-Current-Report BAT37 Data*

BAT37 Trait	Wilcoxon Signed Ranks Test	
(Before – Current)	*Z*	Sig. (2-tailed)
Unusual Perceptions	-.511[a]	.609
Unusual Beliefs	-.384[b]	.701
Eccentricity	-3.073[a]	.002
Cognitive Dysregulation	-.704[a]	.481
Dissociation Proneness	-.575[a]	.566

Note. [a] Client-current-report BAT37 trait with higher sum of ranks. [b] Client-before-report BAT37 trait with higher sum of ranks.

Drug of Choice

Drug of choice data were available for 105 participants from the substance use disorder treatment facility. Participants' drugs of choice were identified as either alcohol ($N = 41$), opioids ($N = 10$), a single other drug ($N = 4$), or polysubstance ($N = 50$). Kruskal-Wallis tests were conducted to determine the relationship of individuals' drugs of choice to each of the traits on the client-current-report BAT37 (see Table 31). Polysubstance users more strongly endorsed the presence of 13 of the 20 BAT37 traits on which the four drug of choice categories demonstrated significant differences: *Emotional Lability*, χ^2 (3,105) = 21.329, $p = .000$, *Anxiousness*, χ^2 (3,105) = 12.368, $p = .006$, *Separation Insecurity*, χ^2 (3,104) = 10.414, $p = .015$, *Pessimism*, χ^2 (3,105) = 8.192, $p = .042$, *Low Self-Esteem*, χ^2 (3,105) = 12.631, $p = .006$, *Guilt/Shame*, χ^2 (3,105) = 15.260, $p = .002$, *Self-Harm*, χ^2 (3,105) = 8.972, $p = .030$, *Depressivity*, χ^2 (3,104) = 10.967, $p = .012$, *Oppositionality*, χ^2 (3,105) = 8.409, $p = .038$, *Deceitfulness*, χ^2 (3,105) =

8.418, $p = .038$, *Recklessness*, χ^2 (3,104) = 13.149, $p = .004$, *Irresponsibility*, χ^2 (3,104) = 16.620, $p = .001$, and *Perseveration*, χ^2 (3,104) = 11.110, $p = .011$. Single other drug users more strongly endorsed the presence of 4 of the 20 BAT37 traits on which the categories demonstrated significant differences: *Submissiveness*, χ^2 (3,105) = 13.724, $p = .003$, *Impulsivity*, χ^2 (3,105) = 14.810, $p = .002$, *Unusual Beliefs*, χ^2 (3,104) = 11.411, $p = .010$, and *Dissociation Proneness*, χ^2 (3,104) = 8.437, $p = .038$. Opioid users more strongly endorsed the presence of 3 of these 20 traits: *Manipulativeness*, χ^2 (3,105) = 13.231, $p = .004$, *Narcissism*, χ^2 (3,105) = 8.045, $p = .045$, and *Distractibility*, χ^2 (3,104) = 13.552, $p = .004$. Alcohol users were not indicated to most strongly endorse the presence of any BAT37 traits, and for all BAT37 traits for which single other drug or opioid users were identified as the strongest endorsers, polysubstance users were identified as the second strongest endorsers.

Table 31. *Relationship Between Drug of Choice and Client-Current-Report BAT37 Data*

	Kruskal-Wallis Test		
BAT37 Trait	Mean Rank	χ^2	Sig.
Emotional Lability		21.329	.000
Alcohol	42.33		
Opioid	36.50		
Single Other	35.00		
Polysubstance	66.49		
Anxiousness		12.368	.006
Alcohol	43.02		
Opioid	42.85		
Single Other	49.25		
Polysubstance	63.51		

Table 31 (continued). *Relationship Between Drug of Choice and Client-Current-Report BAT37 Data*

	Kruskal-Wallis Test		
BAT37 Trait	Mean Rank	χ^2	Sig.
Submissiveness		13.724	.003
Alcohol	40.85		
Opioid	59.00		
Single Other	77.00		
Polysubstance	59.84		
Separation Insecurity		10.414	.015
Alcohol	43.22		
Opioid	51.75		
Single Other	38.13		
Polysubstance	61.59		
Pessimism		8.192	.042
Alcohol	49.00		
Opioid	57.75		
Single Other	20.00		
Polysubstance	57.97		
Low Self-Esteem		12.631	.006
Alcohol	42.51		
Opioid	48.30		
Single Other	44.75		
Polysubstance	63.20		
Guilt/Shame		15.260	.002
Alcohol	40.54		
Opioid	49.00		
Single Other	48.63		
Polysubstance	64.37		

Table 31 (continued). *Relationship Between Drug of Choice and Client-Current-Report BAT37 Data*

	Kruskal-Wallis Test		
BAT37 Trait	Mean Rank	χ^2	Sig.
Self-Harm		8.972	.030
Alcohol	48.85		
Opioid	47.50		
Single Other	47.50		
Polysubstance	57.94		
Depressivity		10.967	.012
Alcohol	42.89		
Opioid	45.80		
Single Other	54.63		
Polysubstance	61.73		
Suspiciousness		6.684	.083
Alcohol	45.82		
Opioid	53.70		
Single Other	38.00		
Polysubstance	58.19		
Social Withdrawal		4.077	.253
Alcohol	46.87		
Opioid	54.05		
Single Other	42.50		
Polysubstance	57.71		
Social Detachment		6.541	.088
Alcohol	44.77		
Opioid	58.89		
Single Other	44.25		
Polysubstance	57.42		

Table 31 (continued). *Relationship Between Drug of Choice and Client-Current-Report BAT37 Data*

		Kruskal-Wallis Test	
BAT37 Trait	Mean Rank	χ^2	Sig.
Intimacy Avoidance		3.407	.333
Alcohol	46.94		
Opioid	57.15		
Single Other	57.00		
Polysubstance	56.82		
Restricted Affectivity		1.271	.736
Alcohol	53.10		
Opioid	43.85		
Single Other	54.50		
Polysubstance	54.63		
Anhedonia		4.463	.216
Alcohol	46.76		
Opioid	55.05		
Single Other	45.75		
Polysubstance	58.29		
Callousness		3.268	.352
Alcohol	50.01		
Opioid	57.80		
Single Other	60.38		
Polysubstance	53.90		
Manipulativeness		13.231	.004
Alcohol	43.90		
Opioid	68.45		
Single Other	30.50		
Polysubstance	59.17		

Table 31 (continued). *Relationship Between Drug of Choice and Client-Current-Report BAT37 Data*

	Kruskal-Wallis Test		
BAT37 Trait	Mean Rank	χ^2	Sig.
Narcissism		8.045	.045
Alcohol	46.73		
Opioid	62.35		
Single Other	29.50		
Polysubstance	58.15		
Histrionism		.876	.831
Alcohol	51.40		
Opioid	53.40		
Single Other	44.13		
Polysubstance	54.94		
Hostility		3.897	.273
Alcohol	49.55		
Opioid	44.05		
Single Other	44.88		
Polysubstance	58.27		
Aggression		2.607	.456
Alcohol	52.85		
Opioid	50.60		
Single Other	34.00		
Polysubstance	55.12		
Oppositionality		8.409	.038
Alcohol	44.73		
Opioid	49.50		
Single Other	48.88		
Polysubstance	60.83		

Table 31 (continued). *Relationship Between Drug of Choice and Client-Current-Report BAT37 Data*

	Kruskal-Wallis Test		
BAT37 Trait	Mean Rank	χ^2	Sig.
Deceitfulness		8.418	.038
Alcohol	48.56		
Opioid	43.60		
Single Other	34.00		
Polysubstance	60.04		
Impulsivity		14.810	.002
Alcohol	40.29		
Opioid	51.10		
Single Other	64.38		
Polysubstance	62.89		
Distractibility		13.552	.004
Alcohol	40.01		
Opioid	62.80		
Single Other	45.50		
Polysubstance	61.10		
Recklessness		13.149	.004
Alcohol	40.34		
Opioid	52.95		
Single Other	59.50		
Polysubstance	61.96		
Irresponsibility		16.620	.001
Alcohol	39.99		
Opioid	53.75		
Single Other	54.83		
Polysubstance	62.37		

Table 31 (continued). *Relationship Between Drug of Choice and Client-Current-Report BAT37 Data*

	Kruskal-Wallis Test		
BAT37 Trait	Mean Rank	χ^2	Sig.
Perfectionism		5.402	.145
Alcohol	55.18		
Opioid	61.30		
Single Other	19.50		
Polysubstance	50.52		
Perseveration		11.110	.011
Alcohol	42.09		
Opioid	51.70		
Single Other	40.50		
Polysubstance	61.92		
Rigidity		4.231	.238
Alcohol	50.02		
Opioid	56.05		
Single Other	23.50		
Polysubstance	55.56		
Orderliness		7.141	.068
Alcohol	57.23		
Opioid	67.95		
Single Other	55.50		
Polysubstance	45.35		
Risk Aversion		2.736	.434
Alcohol	49.60		
Opioid	65.10		
Single Other	45.00		
Polysubstance	52.81		

Table 31 (continued). *Relationship Between Drug of Choice and Client-Current-Report BAT37 Data*

BAT37 Trait	Kruskal-Wallis Test		
	Mean Rank	χ^2	Sig.
Unusual Perceptions		5.511	.138
Alcohol	49.73		
Opioid	48.50		
Single Other	48.50		
Polysubstance	55.81		
Unusual Beliefs		11.411	.010
Alcohol	46.00		
Opioid	50.80		
Single Other	64.67		
Polysubstance	57.44		
Eccentricity		7.221	.065
Alcohol	47.21		
Opioid	55.90		
Single Other	65.17		
Polysubstance	55.40		
Cognitive Dysregulation		6.040	.110
Alcohol	46.30		
Opioid	49.75		
Single Other	60.00		
Polysubstance	57.68		
Dissociation Proneness		8.437	.038
Alcohol	47.80		
Opioid	41.00		
Single Other	61.17		
Polysubstance	58.13		

Note. $df = 3$ for all tests.

BAT37 Intercorrelations

A polychoric correlation matrix of the combined student-report and client-current-report BAT37 data ($n = 673$) was produced to examine intercorrelations between BAT37 traits. In the 37 by 37 matrix, only six correlations demonstrated strength greater than $r_{pc} = .7$: *Low Self-Esteem* and *Guilt/Shame* ($r_{pc} = .762, p < .001$), *Low Self-Esteem* and *Depressivity* ($r_{pc} = .724, p < .001$), *Depressivity* and *Anhedonia* ($r_{pc} = .703, p < .001$), *Social Withdrawal* and *Social Detachment* ($r_{pc} = .734, p < .001$), *Unusual Perceptions* and *Unusual Beliefs* ($r_{pc} = .701, p < .001$), and *Unusual Beliefs* and *Eccentricity* ($r_{pc} = .762, p < .001$). The vast majority of correlations between traits were positive in direction and of the few negative correlations only one demonstrated strength greater than $r_{pc} = .2$: *Recklessness* and *Risk Aversion* ($r_{pc} = -.346, p < .001$).

CHAPTER FIVE
DISCUSSION

BAT37 Findings and *DSM-5* Implications

Correlations between BAT37 traits and theoretically related scales from the PAI, DAPP-BQ, and HEXACO-PI-R (refer to Table 25) provided broad support for the construct validity of the BAT37. Each correlation which was predicted to be strong was in the hypothesized direction, and the strength of the majority of these correlations ranged from moderate to high. However, the following BAT37 traits produced correlations with theoretically related scales which were weaker than $r_{ps} = 0.4$: *Social Detachment*, *Intimacy Avoidance*, *Restricted Affectivity*, *Callousness*, *Histrionism*, *Oppositionality*, *Deceitfulness*, *Perfectionism*, *Perseveration*, *Rigidity*, *Orderliness*, and *Risk Aversion*. There are several possibilities as to why these traits were less strongly related to similar scales from the PAI, DAPP-BQ, and HEXACO-PI-R.

The emphasis on brevity and practicality in creating the BAT37 form undoubtedly compromised its statistical power in assessing the presence of the initially proposed *DSM-5* trait facets (American Psychiatric Association, 2010), which may have resulted in reduced construct validity for some or all of the aforementioned traits. Another possible explanation for the weaker correlations between these traits and theoretically related scales is that the PAI, DAPP-BQ, and HEXACO-PI-R scales used to analyze their validity do not correspond especially closely with the constructs that the BAT37 traits

intend to measure. For example, the weakest of the theoretically related correlations was between *Intimacy Avoidance* and the *Dependence* scale of the HEXACO-PI-R (r_{ps} = -.147, p = .114). One would expect these measures to be negatively correlated with one another as, broadly speaking, the BAT37 trait pertains to an individual's proclivity to resist involvement with others and the HEXACO-PI-R scale pertains to an individual's proclivity to desire involvement with others. However, the strength of the correlation between the two constructs was likely reduced by the fact that *Intimacy Avoidance* measures pathological tendencies – "have very few close friends," "avoid romantic relationships," and "am not interested in being close to others" are the three lines which represented this trait – and the HEXACO-PI-R's *Dependence* scale measures a non-pathological personality construct (refer to Table 15 for a description of the scale).

This dynamic, whereby there was limited similarity between the constructs measured by BAT37 traits and corresponding PAI, DAPP-BQ, and HEXACO-PI-R scales, appeared to have arisen for several of the weaker correlations that were found. It was particularly common for the weakest of the theoretically related correlations to involve a scale from the HEXACO-PI-R, which measures non-pathological personality constructs. Generally, correlations between BAT37 traits and theoretically related scales from the PAI, DAPP-BQ, and HEXACO-PI-R were demonstrated to be satisfactory, and the results of this study suggest that the BAT37 may be a useful instrument for quick measurement of various problematic personality characteristics in individuals.

Several of this study's empirical findings regarding BAT37 data are relevant to the changes proposed by the Personality and Personality Disorders Work Group for the

DSM-5 (American Psychiatric Association, 2010, 2011). A correlation matrix of the combined student-report and client-current-report BAT37 data produced generally weak intercorrelations between BAT37 traits, suggesting that the traits were each measuring independent constructs and that, from an empirical standpoint, there is limited value in eliminating traits from the revised proposal that were included in the initial proposal. It was beyond the scope of this study to empirically address the potential practical value or impact on clinical utility of reducing the number of traits, issues which have been argued by some (e.g., Trull, 2005; Verheul, 2005; Widiger, 2011a, 2011b) to be significant barriers to the successful integration of a dimensional nosology into the personality disorders section of the *DSM-5*.

Generally, the strongest intercorrelations between BAT37 traits were found among traits related to depression (i.e., *Low Self-Esteem*, *Guilt/Shame*, *Depressivity*, and *Anhedonia*) and among traits related to psychoticism (i.e., *Unusual Perceptions*, *Unusual Beliefs*, and *Eccentricity*). *Social Withdrawal* and *Social Detachment* also were strongly correlated with one another relative to correlations between other BAT37 traits. As such, some of the changes made to the initial *DSM-5* proposal (American Psychiatric Association, 2010) and included in the revised *DSM-5* proposal (American Psychiatric Association, 2011) – namely, the elimination of Low Self-Esteem, Guilt/Shame, and Social Detachment from the trait facets, and the combination of Unusual Perceptions and Unusual Beliefs into a single trait – are reasonably well-supported by the empirical findings of this study.

Findings from this study are also relevant to the *DSM-5* proposal in that the exploratory factor analysis of BAT37 traits produced a factor structure that showed

considerable similarity to the trait factors of the Five Factor Model (Costa &McCrae, 1985), which has been suggested by some (e.g., Glover, Crego, & Widiger, 2011; O'Connor, 2005; Saulsman & Page, 2004; Widiger & Lowe, 2008) to be the most useful prototype for developing a *DSM-5* personality disorders framework that integrates dimensionality. The five factors produced by the exploratory factor analysis, titled Negative Affectivity, Antagonism, Detachment, Compulsivity, and Psychoticism, correspond with the Five Factor Model trait factors of Neuroticism, Agreeableness (inversely), Extraversion (inversely), Conscientiousness, and Openness to Experience, respectively. The five factors produced by the exploratory factor analysis of BAT37 data also were similar to the five trait domains included in the revised *DSM-5* proposal (American Psychiatric Association, 2011) – Negative Affectivity, Detachment, Antagonism, Disinhibition, and Psychoticism – particularly if the Compulsivity factor produced by the exploratory factor analysis is conceptualized as the inverse of the Disinhibition domain included in the revised *DSM-5* proposal. This study's support for the existence of a Compulsivity factor rather than a Disinhibition factor may stem from characteristics of the samples used in this study – college students and residents of a private residential SUD treatment facility – which will be discussed later in more detail.

The factor membership of each analyzed BAT37 trait generally made intuitive sense with the exception of *Rigidity*, which loaded onto the Antagonism factor rather than the Compulsivity factor. This suggests that participants may have interpreted the three lines which represented this trait – "believes 'their way' is the only right way," "won't change their routines," and "can't be convinced to change their mind" – in a manner that

resulted in it measuring an interpersonal stubbornness construct more so than a behaviorally compulsive rigidity construct.

Personality Pathology and Substance Use

Traits Which Precede Substance Use. Findings are supportive of the prediction that behavioral, emotional, and cognitive disinhibitive traits related to the broad construct of psychological dysregulation (Clark & Winters, 2002; Thatcher & Clark, 2010) would be indicated to precede SUDs. Consistent with Willem et al.'s (2011) finding that both affective and self-regulatory variables are relevant to problematic substance use and Littlefield and Sher's (2010) assertion that distinct pathways to substance use need not be conceptualized as mutually exclusive, client-before-report BAT37 data generally support the plausibility of both disinhibition-related and self-medication theories of the etiology of SUDs. The BAT37 traits of *Impulsivity*, *Recklessness*, *Distractibility*, *Hostility*, and *Irresponsibility* are consistent with the traditional notion of disinhibition and were indicated to be elevated in individuals prior to the onset of regular substance use. *Anxiousness*, *Emotional Lability*, *Guilt/Shame*, *Low Self-Esteem*, *Depressivity* and, arguably, *Separation Insecurity* and *Submissiveness*, are related to the traditional notion of self-medication and were also indicated to be elevated in individuals prior to the onset of regular substance use.

It is somewhat challenging to explain the findings that the BAT37 traits of *Perfectionism*, *Rigidity*, and *Perseveration* were elevated in individuals prior to the start of their regular substance use, as research has routinely suggested that traits related to compulsivity or conscientiousness are negatively predictive of substance use (Kotov et al., 2010; Malouff et al., 2006; Martin & Sher, 1994; McCormick et al., 1998; Ruiz et al.,

2003; Terracciano et al., 2008; Walton & Roberts, 2004). These elevations may reflect limitations in the construct validity of these BAT37 traits. It is perhaps more likely, however, that these elevations are unique to the sample of individuals with SUDs that was used in this study. Many of the residents of the sampled SUD treatment facility are professionals with advanced degrees, some of whom were referred for treatment by their employer or professional regulatory body due to concerns about substance use. As such, it is probable that the self-reported elevations of *Perfectionism*, *Rigidity*, and *Perseveration* prior to the onset of regular substance use are unique to this sample and would not be replicated in many other SUD treatment settings.

The lack of elevations of BAT37 traits belonging to the initially proposed *DSM-5* trait domains (American Psychiatric Association, 2010) of introversion and schizotypy prior to the onset of SUDs is consistent with hypotheses. Low scores for BAT37 traits comprising the schizotypy domain are also likely due in part to the nature of the SUD sample used in this study, and these results may not generalize to other SUD treatment settings. Low scores for BAT37 traits comprising the introversion domain are consistent with previous research which suggests that externalizing tendencies are generally more predictive of SUDs than internalizing tendencies (Hopwood et al., 2008; Krueger et al., 2002; Rielage et al., 2010). Altogether, the results of this study indicate that broadly disinhibitive traits, as defined by the construct of psychological dysregulation (Clark & Winters, 2002; Thatcher & Clark, 2010), are most predictive of future SUDs, but that these are not the only pathological personality traits which predict SUDs. Personality pathology in general appears to be predictive of problematic substance use, particularly given that the means of client-before-report BAT37 traits exceeded the means of student-

report BAT37 traits for all but six traits. Only *Perfectionism*, *Orderliness*, *Unusual Perceptions*, *Unusual Beliefs*, *Eccentricity*, and *Cognitive Dysregulation* were higher in the student-report sample.

Changes in Traits Between Non-Problematic Use and SUDs. Also consistent with hypotheses, the following BAT37 traits were indicated to have increased in severity in individuals in the period between non-problematic substance use and the onset of SUDs: *Separation Insecurity*, *Depressivity*, *Callousness*, *Narcissism*, *Histrionism*, *Hostility*, *Oppositionality*, *Deceitfulness*, *Impulsivity*, *Recklessness*, *Irresponsibility*, *Rigidity*, and *Eccentricity*. Although these constructs span various trait domains, BAT37 traits related to behavioral disinhibition appeared to increase with relatively notable regularity; highly compatible with this trend is the finding that *Perfectionism*, a trait which – in a slightly modified form – is suggested in the revised *DSM-5* proposal (American Psychiatric Association, 2011) to represent the inverse of disinhibition, is the lone BAT37 trait indicated to demonstrate a statistically significant decrease following the onset of regular substance use.

These results are consistent with Littlefield et al.'s (2009) finding that individuals with higher levels of impulsivity – a construct closely related to disinhibition (Carver, 2005) – were less likely to "mature out" of problematic alcohol consumption and de Wit's (2009) suggestion that impulsivity likely increases in response to continued substance use. It can only be speculated to what extent these changes in traits related to behavioral disinhibition are due to physiological, socio-cultural, cognitive, or other variables in individuals who regularly use substances. It is likely an interactive combination of these factors, the dynamics of which warrant further exploration in future research. Analysis of

changes in BAT37 traits between non-problematic use and SUDs also indicated that traits related to interpersonal difficulties and negative emotionality increase in tandem with substance use.

Personality-Based Typologies of Individuals With SUDs. The results of the cluster analysis performed in this study did not suggest that there are qualitatively different personality "types" of individuals with SUDs. Rather, the results indicated that there are individuals who enter treatment for SUDs with quantitatively different levels of willingness to endorse the presence of pathology in themselves – perhaps due to varying levels of psychological distress upon entrance to treatment or characterological differences in self-appraisal tendencies, among other possibilities. This finding appears contrary to other research findings (Babor et al., 1992; Cloninger, 1987; Hall et al., 2010; Hauser & Rybakowski, 1997; Hill, 1992; Jellinek, 1960; Moss et al., 2007; Schuckit et al., 1995; Windle & Scheidt, 2004) which have indicated the existence of discrete groups of individuals who use substances, and it suggests that individual differences are more pronounced than group differences in those who are treated for SUDs. The present study may not have produced qualitatively different groups of individuals with SUDs because, unlike each of the aforementioned studies which did indicate the existence of typologies of users, only personality variables – and no demographic or other non-personality variables (e.g., age, gender, ethnicity, socio-economic status, family history of SUDs, comorbid psychiatric diagnoses, etc.) – were included in the cluster analysis. This was done intentionally, as a primary aim of the study was to examine whether there exists a purely personality-based typology of those with SUDs.

Despite indications from this study that there does not exist an exclusively personality-based typology of individuals with SUDs, there were still several interesting findings regarding subdivisions of those entering SUD treatment. Individuals who reported the greatest levels of personality pathology were indicated to be younger and to have begun using substances regularly at an earlier age. These findings are consistent with other research which suggests that personality pathology in general is strongly associated with youth (Yang, Coid, & Tyrer, 2010). There are several possible explanations for younger respondents reporting that they began to regularly use substances at an earlier age, with one being that the accuracy of respondents' memories of the timing of the start of their substance use varied depending on how long ago it was and another being that individuals are beginning to problematically use substances at younger ages than they did in the past. It also warrants mentioning that there were indicated to be few gender differences in BAT37 traits among respondents in the SUD treatment sample. The four BAT37 traits for which statistically significant gender differences were found – *Restricted Affectivity* (males were higher), *Anxiousness* (females were higher), *Depressivity* (females were higher), and *Social Detachment* (females were higher) – demonstrated differences that are broadly consistent with gender stereotypes and with prior research on gender differences in personality traits (Costa, Terracciano, & McCrae, 2001).

It is interesting that in this study the level of compulsivity-related traits was indicated to be relatively high in individuals with SUDs. At the same time, scores on the Compulsivity factor identified in the exploratory factor analysis did not demonstrate the same linear relationship with the three cluster solution that was demonstrated by the other

four factors. This appears to be because the BAT37 traits comprised by the Compulsivity factor were less related to willingness to report pathology than the traits comprised by the other factors, as *Orderliness* (r_{ps} = -.075, p = .311), *Risk Aversion* (r_{ps} = -.091, p = .187), and *Perfectionism* (r_{ps} = -.143, p = .033) demonstrated the weakest, second-weakest, and third-weakest correlations, respectively, with the PAI's *PIM* scale as compared to all of the BAT37 traits. Finally, the finding that those with the greatest degree of personality pathology across various trait domains are most likely to abuse multiple substances also warrants mentioning. The relatively small sample size included in the analysis of drug of choice data makes it difficult to speculate in-depth about the nature of the relationship between personality and drug of choice. Broadly, the results of this study provide some indication that personality pathology in general increases the likelihood of substance use and that the more severe the personality pathology is, the more likely the individual is to abuse multiple substances.

Limitations

There are several limitations to the present study. It should be noted that the samples used in this study may not be fully generalizable to the populations which they were intended to represent. This was especially true of the SUD sample, as the participants from the sampled residential SUD treatment facility were probably more educated and with higher socio-economic statuses than the majority of individuals in other SUD treatment facilities or programs and, particularly, the majority of individuals with SUDs in general. It is difficult to say how such demographic differences may affect the generalizability of the personality-related findings in this study, but given the discrepancies with past research findings it is likely that the nature of the present SUD

sample explains the surprising elevations in compulsivity-related traits on both the client-before-report and client-current-report BAT37.

Another limitation to this study was the restricted statistical power of the BAT37 in measuring each of the initially proposed *DSM-5* traits (American Psychiatric Association, 2010) with only one four-point scale. The construct validity of the form was demonstrated to be (at least) adequate, but the emphasis on practical value and brevity of administration in developing the BAT37 ultimately limited the statistical analyses which were available and undoubtedly compromised the psychometric properties of the measure to some extent.

Perhaps the most significant limitation of the study was the exclusive use of self-report to assess the presence of personality pathology in individuals. There is a considerable body of research suggesting that self-reports of personality pathology should be met with skepticism and that corroborating other-reports of personality pathology add validity to assessments of evaluative or broadly negative aspects of individuals (Bernieri, Zuckerman, Koestner, & Rosenthal, 1994; Connelly, 2009; Fielder, Oltmanns, & Turkheimer, 2004; John & Robins, 1993; Miller, Pilkonis, & Clifton, 2005; Oltmanns, Friedman, Fiedler, & Turkheimer, 2004; Oltmanns, Turkheimer, & Strauss, 1998; Thomas, Turkheimer, & Oltmanns, 2003; Vazire & Mehl, 2008; Watson, Hubbard, & Wiese, 2000). This study's limitation in utilizing self-reports was compounded by requesting participants in the SUD treatment sample to provide retrospective self-reports of past personality functioning, and the resultant potential for inaccuracies should be kept in mind when interpreting findings which incorporated data from the client-before-report BAT37. Obviously, it would be vastly superior from a statistical validity standpoint to

utilize a longitudinal research design to compare personality before substance use to personality following the onset of problematic substance use, but such a research design is highly impractical for most researchers.

Future Directions

It may be worth further exploring the validity and reliability of the BAT37, as it indicated in its early stages that it has potential to be a useful measure for quickly screening for the presence of personality pathology. Possible alterations to the content of the form should be considered, either in response to psychometric findings or to mirror the changes that ultimately appear in the *DSM-5*. Other-report versions of the measure can be developed and validated to allow for corroborating reports of personality pathology from individuals who are familiar with respondents.

A great deal of research is underway to determine the appropriate course to take in the personality disorders section of the *DSM-5*. This study provided some empirical data which pertains to decisions that will be made by the Personality and Personality Disorders Work Group. Investigation into the clinical utility of the proposed changes was beyond the scope of this study and is a line of research that may be just as relevant to decisions about the course of the *DSM-5*, if not more so, as empirical findings regarding the proposed trait domains and facets.

This study's various findings regarding the relationship between personality and SUDs should be replicated to ensure their veracity, particularly given the unique nature of the sample that was used relative to the SUD population. It would likely be highly worthwhile to utilize other-reports from individuals who know participants well (e.g.,

family members, significant others, treatment providers, etc.) to corroborate the self-reported personality pathology of participants.

Finally, as researchers continue to clarify the nature of the relationship between personality and problematic substance use, it will be important to investigate ways in which findings can be translated into effective strategies for prevention and treatment of SUDs. A study by Conrod, Castellanos-Ryan, and Mackie (2011) provides indication that personality-based interventions designed to address substance use can produce positive results.

Conclusion

The construct validity of the BAT37 was supported by correlations with theoretically related scales of the PAI, DAPP-BQ, and HEXACO-PI-R. Using the BAT37, this study produced several findings that are relevant to the proposed changes to the personality disorders section of the *DSM-5*. Although the initially proposed *DSM-5* trait facets (American Psychiatric Association, 2010) were indicated to be independent constructs which need not be reduced in number due to concerns about intercorrelations between traits, the changes which were made to the initial *DSM-5* proposal and included in the revised *DSM-5* proposal (American Psychiatric Association, 2011) were reasonably well supported by this study's findings. The results of an exploratory factor analysis of the BAT37 traits suggested a factor structure that is similar to the factors of the Five Factor Model (Costa & McCrae, 1985).

Regarding the relationship between personality pathology and substance use, the results of this study indicated that personality traits consistent with both disinhibition-related and self-medication theories of SUD etiology precede problematic substance use

in individuals. Somewhat surprisingly, BAT37 traits related to compulsivity were indicated to have preceded SUDs and to be present in individuals with SUDs. BAT37 traits related to behavioral disinhibition were most prominently indicated to increase in the period between non-problematic substance use and SUDs, and traits related to negative emotionality and problems in interpersonal functioning were also indicated to increase in tandem with substance use. Support was not found for a personality-based typology of individuals with SUDs. Generally, findings suggested that personality pathology in general is predictive of SUDs, both presently and prospectively, and that the more severe an individual's personality pathology, the more likely he or she is to abuse multiple substances.

REFERENCES

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text revision). Washington, DC: Author.

American Psychiatric Association. (2010, August 12). *DSM-5 development*. Retrieved from http://www.dsm5.org

American Psychiatric Association. (2011, July 28). *DSM-5 development*. Retrieved from http://www.dsm5.org

American Psychological Association. (2002). Ethical principles of psychologists and code of conduct. *American Psychologist, 57*, 1060-1073.

Andrews, M. M., Meda, S. A., Thomas, A. D., Potenza, M. N., Krystal, J. H., Worhunsky, P., et al. (2011). Individuals family history positive for alcoholism show functional magnetic resonance imaging differences in reward sensitivity that are related to impulsivity factors. *Biological Psychiatry, 69*(7), 675-683.

Arendt, M., Rosenberg, R., Fjordback, L., Brandholdt, J., Foldager, L., Sher, L., et al. (2007). Testing the self-medication hypothesis of depression and aggression in cannabis-dependent subjects. *Psychological Medicine, 37*, 935-945.

Armeli, S., Tennen, H., Affleck, G., & Kranzler, H. R. (2000). Does affect mediate the association between daily events and alcohol use? *Journal of Studies on Alcohol, 61*, 862-871.

Ashton, M. C., & Lee, K. (2001). A theoretical basis for the major dimensions of personality. *European Journal of Personality*, *15*, 327-353.

Ashton, M. C., & Lee, K. (2007). Empirical, theoretical, and practical advantages of the HEXACO model of personality structure. *Personality and Social Psychology Review*, *11*, 150-166.

Ashton, M. C., & Lee, K. (2009). The HEXACO-60: A short measure of the major dimensions of personality. *Journal of Personality Assessment*, *91*(4), 340-345.

Babor, T. F., & Caetano, R. (2006). Subtypes of substance dependence and abuse: Implications for diagnostic classification and empirical research. *Addiction*, *101* (Suppl. 1), 104-110.

Babor, T. F., Dolinsky, Z. S., Meyer, R. E., Hesselbrock, M., Hofmann, M., & Tennen, H. (1992). Types of alcoholics: Concurrent and predictive validity of some common classification schemes. *British Journal of Addiction*, *87*, 1415-1431.

Ball, S. A., Carroll, K. M., Babor, T. F., & Rousaville, B. J. (1995). Subtypes of cocaine abusers: Support for a type A – type B distinction. *Journal of Consulting and Clinical Psychology*, *63*(1), 115-124.

Belter, R. W., & Piotrowski, C. (2001). Current status of doctoral-level training in psychological testing. *Journal of Clinical Psychology*, *57*, 717-726.

Bender, D. S., Morey, L. C., & Skodol, A. E. (2011). Toward a model for assessing level of personality functioning in *DSM-5*, part I: A review of theory and methods. *Journal of Personality Assessment*, *93*(4), 332-346.

Bernieri, F. J., Zuckerman, M., Koestner, R., & Rosenthal, R. (1994). Measuring person perception accuracy: Another look at self-other agreement. *Personality and Social Psychology Bulletin, 20*(4), 367-378.

Bickel, W. K., Odum, A. L., & Madden, G. J. (1999). Impulsivity and cigarette smoking: Delay discounting in current, never, and ex-smokers. *Psychopharmacology, 146*, 447-454.

Block, J., Block, J. H., & Keyes, S. (1988). Longitudinally foretelling drug usage in adolescence: Early childhood personality and environmental precursors. *Child Development, 59*, 336-355.

Boccaccini, M. T., & Brodsky, S. L. (1999). Diagnostic test usage by forensic psychologists in emotional injury cases. *Professional Psychology: Research and Practice, 30*, 253-259.

Bogg, T., & Roberts, B. W. (2004). Conscientiousness and health-related behaviors: A meta-analysis of leading behavioral contributors to mortality. *Psychological Bulletin, 130*(6), 887-919.

Buhler, K-E., & Bardeleben, H. (2008). Heuristic cluster analysis of alcoholics according to biographic and personality features. *Addiction Research and Theory, 16*(5), 453-473.

Bukstein, O. G. (2000). Disruptive behavior disorders and substance use disorders in adolescents. *Journal of Psychoactive Drugs, 32*, 67-79.

Burns, L., & Teesson, M. (2002). Alcohol use disorders comorbid with anxiety, depression and drug use disorders: Findings from the Australian National Survey of Mental Health and Well Being. *Drug and Alcohol Dependence, 68*, 299-307.

Buss, A., & Plomin, R. (1984). *Temperament: Early-developing personality traits.* Hillsdale, NJ: Erlbaum.

Cadoret, R., Troughton, E., Widmer, R. (1984). Clinical differences between antisocial and primary alcoholics. *Comprehensive Psychiatry, 25*(1), 1-8.

Carver, C. S. (2005). Impulse and constraint: Perspectives from personality psychology, convergence with theory in other areas, and potential for integration. *Personality and Social Psychology Review, 9*(4), 312-333.

Caspi, A., Begg, D., Dickson, N., Harrington, H., Langley, J., Moffitt, T.E., et al. (1997). Personality differences predict health-risk behaviors in young adulthood: Evidence from a longitudinal study. *Journal of Personality and Social Psychology, 73*(5), 1052-1063.

Castellanos-Ryan, N., & Conrod, P. J. (2011). Personality correlates of the common and unique variance across conduct disorder and substance misuse symptoms in adolescence. *Journal of Abnormal Child Psychology, 39*, 563-576.

Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research, 1*, 245-276.

Chakroun, N., Johnson, E. I., & Swendsen, J. (2010). Mood and personality-based models of substance use. *Psychology of Addictive Behaviors, 24*(1), 129-136.

Chassin, L., Pitts, S. C., DeLucia, C., & Todd, M. (1999). A longitudinal study of children of alcoholics: Predicting young adult substance use disorders, anxiety, and depression. *Journal of Abnormal Psychology, 108*(1), 106-119.

Clark, D. B., Cornelius, J. R., Kirisci, L., & Tarter, R. E. (2005). Childhood risk categories for adolescent substance involvement: A general liability typology. *Drug and Alcohol Dependence, 69*, 51-60.

Clark, D. B., & Winters, K. C. (2002). Measuring risks and outcomes in substance use disorders prevention research. *Journal of Consulting and Clinical Psychology, 70*(6), 1207-1223.

Clarke, S., & Robertson, I. T. (2005). A meta-analytic review of the Big Five personality factors and accident involvement in occupational and non-occupational settings. *Journal of Occupational and Organizational Psychology, 78*, 355-376.

Cloninger, C. R. (1987). Neurogenetic adaptive mechanisms in alcoholism. *Science, 236*, 410-416.

Cloninger, C. R., Przybeck, T. R., & Svrakic, D. M. (1991). The Tridimensional Personality Questionnaire: U.S. normative data. *Psychological Reports, 69*(3), 1047-1057.

Cloninger, C. R., Przybeck, T. R., Svrakic, D. M., & Wetzel, R. D. (1994). *The Temperament and Character Inventory (TCI): A guide to its development and use.* St. Louis, MO: Center for Psychobiology of Personality.

Cloninger, C. R., Sigvardsson, S., & Bohman, M. (1988). Childhood personality predicts alcohol abuse in young adults. *Alcoholism: Clinical and Experimental Research, 12*(4), 494-505.

Cloninger, C. R., Svrakic, D. M., & Przybeck, T. R. (1993). A psychobiological model of temperament and character. *Archives of General Psychiatry, 50*, 975-990.

Colder, C. R. (2001). Life stress, physiological and subjective indexes of negative emotionality, and coping reasons for drinking: Is there evidence for a self-medication model of alcohol use?. *Psychology of Addictive Behaviors*, *15*(3), 237-245.

Connelly, B. S. (2009). The reliability, convergence, and predictive validity of personality ratings: An other perspective. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, *69*(09), 5817.

Conrod, P. J., Castellanos-Ryan, N., & Mackie, C. (2011). Long-term effects of a personality-targeted intervention to reduce alcohol use in adolescents. *Journal of Consulting and Clinical Psychology*, *79*(3), 296-306.

Conway, K. P., Kane, R. J., Ball, S. A., Poling, J. C., & Rounsaville, B. J. (2003). Personality, substance of choice, and polysubstance involvement among substance dependent patients. *Drug and Alcohol Dependence*, *71*, 65-75.

Conway, K. P., Swendsen, J. D., Rounsaville, B. J., & Merikangas, K. R. (2002). Personality, drug of choice, and comorbid psychopathology among substance abusers. *Drug and Alcohol Dependence*, *65*, 225-234.

Cooper, M. L. (1994). Motivations for alcohol use among adolescents: Development and validation of a four-factor model. *Psychological Assessment*, *6*(2), 117-128.

Cooper, M. L., Agocha, V. B., & Sheldon, M. S. (2000). A motivational perspective on risky behaviors: The role of personality and affect regulatory processes. *Journal of Personality*, *68*(6), 1059-1088.

Costa, P. T., Jr., & McCrae, R. R. (1985). *The NEO Personality Inventory manual*. Odessa, FL: Psychological Assessment Resources.

Costa, P. T., Jr., Terracciano, A., & McCrae, R. R. (2001). Gender differences in personality traits across cultures: Robust and surprising findings. *Journal of Personality and Social Psychology, 81*(2), 322-331.

Cox, W. M., & Klinger, E. (1988). A motivational model of alcohol use. *Journal of Abnormal Psychology, 97*(2), 168-180.

Craig, R. J. (1982). Personality characteristics of heroin addicts: Review of empirical research 1976-1979. *International Journal of the Addictions, 17*(2), 227-248.

Craig, R. J. (1986). The personality structure of heroin addicts [Monograph]. *Behavioral Control in Drug Abuse, 74*, 25-36.

Daudin, M., Cohen, D., Edel, Y., Bonnet, N., Bodeau, N., Consoli, A., et al. (2010). Psychosocial and clinical correlates of substance use disorder in an adolescent inpatient psychiatric population. *Journal of the Canadian Academy of Child and Adolescent Psychiatry, 19*(4), 264-273.

De Wit, H. (2009). Impulsivity as a determinant and consequence of drug use: A review of underlying processes. *Addiction Biology, 14*, 22-31.

Durbin, C. E., & Klein, D. N. (2006). Ten-year stability of personality disorders among outpatients with mood disorders. *Journal of Abnormal Psychology, 115*(1), 75-84.

Elkins, I. J., McGue, M., & Iacono, W. G. (2007). Prospective effects of attention-deficit/hyperactivity disorder, conduct disorder, and sex on adolescent substance use and abuse. *Archives of General Psychiatry, 64*(10), 1145-1152.

Ersche, K. D., Turton, A. J., Pradhan, S., Bullmore, E. T., & Robbins, T. W. (2010). Drug addiction endophenotypes: Impulsive versus sensation-seeking personality traits. *Biological Psychiatry, 68*(8), 770-773.

Everitt, B. J., Belin, D., Economidou, D., Pelloux, Y., Dalley, J. W., & Robbins, T. W. (2008). Neural mechanisms underlying the vulnerability to develop compulsive drug-seeking habits and addiction. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *363*, 3125-3135.

Fergusson, D. M., Boden, J. M., & Horwood, L. J. (2009). Tests of causal links between alcohol abuse or dependence and major depression. *Archives of General Psychiatry*, *66*(3), 260-266.

Fiedler, E. R., Oltmanns, T. F., & Turkheimer, E. (2004). Traits associated with personality disorders and adjustment to military life: Predictive validity of self and peer reports. *Military Medicine*, *169*(3), 207-211.

Finn, P. R., Sharkansky, E. J., Brandt, K. M., & Turcotte, N. (2000). The effects of familial risk, personality, and expectancies on alcohol use and abuse. *Journal of Abnormal Psychology*, *109*(1), 122-133.

Flynn, H. A. (2000). Comparison of cross-sectional and daily reports in studying the relationship between depression and use of alcohol in response to stress in college students. *Alcoholism: Clinical and Experimental Research*, *24*(1), 48-52.

Frances, A. (1993). Dimensional diagnosis of personality: Not whether, but when and which. *Psychological Inquiry*, *4*, 110-111.

Franques, P., Auriacombe, M., Piquemal, E., Verger, M., Brisseau-Gimenez, S., Grabot, D., et al. (2003). Sensation seeking as a common factor in opioid dependent subjects and high risk sport practicing subjects. A cross sectional study. *Drug and Alcohol Dependence*, *69*, 121-126.

Friedman, H. S., Tucker, J. S., Tomlinson-Keasey, C., Schwartz, J. E., Wingard, D. L., & Criqui, M. H. (1993). Does childhood personality predict longevity?. *Journal of Personality and Social Psychology*, *65*(1), 176-185.

Galen, L. W., Henderson, M. J., & Whitman, R. D. (1996). The utility of novelty seeking, harm avoidance, and expectancy in the prediction of drinking. *Addictive Behaviors*, *22*(1), 93-106.

Galizio, M., Rosenthal, D., & Stein, F. A. (1983). Sensation seeking, reinforcement, and student drug use. *Addictive Behaviors*, *8*(3), 243-252.

George, S. M., Connor, J. P., Gullo, M. J., & Young, R. M. (2010). A prospective study of personality features predictive of early adolescent alcohol misuse. *Personality and Individual Differences*, *49*, 204-209.

Glaser, B., Shelton, K. H., & van den Bree, M. B. M. (2010). The moderating role of close friends in the relationship between conduct problems and adolescent substance use. *Journal of Adolescent Health*, *47*, 35-42.

Glover, N. G., Crego, C., & Widiger, T. A. (2011). The clinical utility of the Five Factor Model of personality disorder. *Personality Disorders: Theory, Research, and Treatment*. Advance online publication. doi: 10.1037/a0024030

Goldstein, R. Z., & Volkow, N. D. (2002). Drug addiction and its underlying neurobiological basis: Neuroimaging evidence for the involvement of the frontal cortex. *American Journal of Psychiatry*, *159*, 1642-1652.

Grant, B. F., Stinson, F. S., Dawson, D. A., Chou, S. P., Dufour, M. C., Compton, W., et al. (2004). Prevalence and co-occurrence of substance use disorders and independent mood and anxiety disorders: Results from the National Epidemiologic Survey on alcohol and related conditions. *Archives of General Psychiatry, 61*, 807-816.

Grant, B. F., Stinson, F. S., Dawson, D. A., Chou, S. P., Ruan, W. J., & Pickering, R. P. (2006). Co-occurrence of 12-month alcohol and drug use disorders and personality disorders in the United States: Results from the National Epidemiologic Survey on alcohol and related conditions. *Alcohol Research & Health, 29*(2), 121-130.

Grilo, C. M., Sanislow, C. A., Gunderson, J. G., Pagano, M. E., Yen, S., Zanarini, M. C., et al. (2004). Two-year stability and change of schizotypal, borderline, avoidant, and obsessive-compulsive personality disorders. *Journal of Consulting and Clinical Psychology, 72*(5), 767-775.

Gullo, M. J., Ward, E., Dawe, S., Powell, J., & Jackson, C. J. (2011). Support for a two-factor model of impulsivity and hazardous substance use in British and Australian young adults. *Journal of Research in Personality, 45*, 10-18.

Haber, J. R., Jacob, T., & Heath, A. C. (2005). Paternal alcoholism and offspring conduct disorder: Evidence for the 'common genes' hypothesis. *Twin Research and Human Genetics, 8*(2), 120-131.

Hall, D. H., & Queener, J. E. (2007). Self-medication hypothesis of substance use: Testing Khantzian's updated theory. *Journal of Psychoactive Drugs*, 39(2), 151-158.

Hall, T. H., Howard, M. O., & McCabe, S. E. (2010). Subtypes of adolescent sedative/anxiolytic misusers: A latent profile analysis. *Addictive Behaviors*, *35*, 882-889.

Ham, L. S., & Hope, D. A. (2003). College students and problematic drinking: A review of the literature. *Clinical Psychology Review*, *23*, 719-759.

Hasin, D. S., Goodwin, R. D., Stinson, F. S., & Grant, B. F. (2005). Epidemiology of major depressive disorder: Results from the National Epidemiologic Survey on alcoholism and related conditions. *Archives of General Psychiatry*, *62*, 1097-1106.

Hauser, J., & Rybakowski, J. (1997). Three clusters of male alcoholics. *Drug and Alcohol Dependence*, *48*, 243-250.

Henry, D. B., Tolan, P. H., & Gorman-Smith, D. (2005). Cluster analysis in family psychology research. *Journal of Family Psychology*, *19*(1), 121-132.

Hesselbrock, V. M., & Hesselbrock, M. N. (2006). Are there empirically supported and clinically useful subtypes of alcohol dependence? *Addiction*, *101*(Suppl. 1), 97-103.

Heyman, G. M. (2009). *Addiction: A disorder of choice*. Cambridge, MA: Harvard University Press.

Heyman, G. M., & Dunn, B. (2002). Decision biases and persistent illicit drug uses: An experimental study of distributed choice and addiction. *Drug and Alcohol Dependence*, *67*(2), 193-203.

Heyman, G. M., & Gibb, S. P. (2006). Delay discounting in college cigarette chippers. *Behavioural Pharmacology*, *17*, 669-679.

Hicks, B. M., Iacono, W. G., & McGue, M. (2010). Consequences of an adolescent onset and persistent course of alcohol dependence in men: Adolescent risk factors and adult outcomes. *Alcoholism: Clinical and Experimental Research, 34*(5), 819-833.

Hill, S. Y. (1992). Absence of paternal sociopathy in the etiology of severe alcoholism: Is there a type III alcoholism?. *Journal of Studies on Alcohol, 53*(2), 161-169.

Hopwood, C. J., Baker, K. L., & Morey, L. C. (2008). Personality and drugs of choice. *Personality and Individual Differences, 44*, 1413-1421.

Hopwood, C. J., Malone, J. C., Ansell, E. B., Sanislow, C. A., Grilo, C. M., Pinto, A., et al. (in press). Separation of severity and style in personality disorder symptoms. *Journal of Personality Disorders*.

Hussong, A. M., Galloway, C. A., & Feagans, L. A. (2005). Coping motives as a moderator of daily mood-drinking covariation. *Journal of Studies on Alcohol, 66*(3), 344-353.

Jaffe, L. T., & Archer, R. P. (1987). The prediction of drug use among college students from MMPI, MCMI, and sensation seeking scales. *Journal of Personality Assessment, 51*(2), 243-253.

Jahng, S., Trull, T. J., Wood, P. K., Tragesser, S. L., Tomko, R., Grant, J. D., et al. (2011). Distinguishing general and specific personality disorder features and implications for substance dependence comorbidity. *Journal of Abnormal Psychology, 120*(3), 656-669.

Jellinek, E. M. (1960). *The disease concept of alcoholism*. New Haven, CT: Hillhouse.

John, O. P., & Robins, R. W. (1993). Determinants of interjudge agreement on personality traits: The Big Five domains, observability, evaluativeness, and the unique perspective of the self. *Journal of Personality, 61*(4), 521-551.

Johnson, J. G., Cohen, P., Kasen, S., Skodol, A. E., Hamagami, F., & Brook, J. S. (2000). Age-related change in personality disorder trait levels between early adolescence and adulthood: A community-based longitudinal investigation. *Acta Psychiatrica Scandinavica, 102*, 265-275.

Kandel, D. B., Johnson, J. G., Bird, H. R., Weissman, M. M., Goodman, S. H., Lahey, B. B., et al. (1999). Psychiatric comorbidity among adolescents with substance use disorders: Findings from the MECA study. *Journal of the American Academy of Child and Adolescent Psychiatry, 38*, 693-699.

Kassel., J. D. (Ed.). (2010). *Substance abuse and emotion.* Washington, DC: American Psychological Association.

Kessler, R. C., Crum, R. M., Warner, L. A., Nelson, C. B., Schulenberg, J., & Anthony, J. C. (1997). Lifetime co-occurrence of *DSM-III-R* alcohol abuse and dependence with other psychiatric disorders in the National Comorbidity Survey. *Archives of General Psychiatry, 54*, 313-321.

Khantzian, E. J. (1985). The self-medication hypothesis of addictive disorders: Focus on heroin and cocaine dependence. *American Journal of Psychiatry, 142*(11), 1259-1264.

Kirby, K. N., Petry, N. M., & Bickel, W. K. (1999). Heroin addicts have higher discount rates for delayed rewards than non-drug-using controls. *Journal of Experimental Psychology, 128*(1), 78-87.

Koob, G. F. (2009). New dimensions in human laboratory models of addiction. *Addiction Biology, 14*, 1-8.

Kotov, R., Gamez, W., Schmidt, F., & Watson, D. (2010). Linking "big" personality traits to anxiety, depression, and substance use disorders: A meta-analysis. *Psychological Bulletin, 136*(5), 768-821.

Krueger, R. F., Hicks, B. M., Patrick, C. J., Carlson, S. R., Iacono, W. G., & McGue, M. (2002). Etiologic connections among substance dependence, antisocial behavior, and personality: Modeling the externalizing spectrum. *Journal of Abnormal Psychology, 111*(3), 411-424.

Le Bon, O., Basiaux, P., Streel, E., Tecco, J., Hanak, C., Hansenne, M., et al. (2004). Personality profile and drug of choice; a multivariate analysis using Cloninger's TCI on heroin addicts, alcoholics, and a random population group. *Drug and Alcohol Dependence, 73*, 175-182.

Lee, K., & Ashton, M. C. (2004). Psychometric properties of the HEXACO Personality Inventory. *Multivariate Behavioral Research, 39*(2), 329-358.

Lee, K., & Ashton, M. C. (2011, September 18). *The HEXACO Personality Inventory – Revised: A measure of the six major dimensions of personality.* Retrieved from http://www.hexaco.org

Lenzenweger, M. F., Johnson, M. D., & Willett, J. B. (2004). Individual growth curve analysis illuminates stability and change in personality disorder features. *Archives of General Psychiatry, 61*, 1015-1024.

Littlefield, A. K., & Sher, K. J. (2010). The multiple, distinct ways that personality contributes to alcohol use disorders. *Social and Personality Psychology Compass, 4*(9), 767-782.

Littlefield, A. K., Sher, K. J., & Wood, P. K. (2009). Is "maturing out" of problematic alcohol involvement related to personality change?. *Journal of Abnormal Psychology, 118*(2), 360-374.

Livesley, W. J., & Jackson, D. N. (2009). *Dimensional Assessment of Personality Pathology – Basic Questionnaire technical manual.* Port Huron, MI: SIGMA Assessment Systems, Inc.

Lynne-Landsman, S. D., Graber, J. A., Nichols, T. R., & Botvin, G. J. (2011). Is sensation seeking a stable trait or does it change over time?. *Journal of Youth and Adolescence, 40*(1), 48-58.

Magid, V. (2010). Disinhibition and the self-medication model of alcohol use. *Dissertation Abstracts International: Section B: The Sciences and Engineering, 70* (09), 5832.

Malouff, J. M., Thorsteinsson, E. B., & Schutte, N. S. (2006). The Five-Factor Model of personality and smoking: A meta-analysis. *Journal of Drug Education, 36*(1), 47-58.

Markon, K. E., Krueger, R. F. (2005). Categorical and continuous models of liability to externalizing disorders. *Archives of General Psychiatry, 62*, 1352-1359.

Markon, K. E., Krueger, R. F., & Watson, D. (2005). Delineating the structure of normal and abnormal personality: An integrative hierarchical approach. *Journal of Personality and Social Psychology, 88*(1), 139-157.

Martin, E. D., & Sher, K. J. (1994). Family history of alcoholism, alcohol use disorders and the Five-Factor Model of personality. *Journal of Studies on Alcohol, 55*, 81-90.

Mason, W. A., Hitch, J. E., & Spoth, R. L. (2009). Longitudinal relations among negative affect, substance use, and peer deviance during the transition from middle to late adolescence. *Substance Use & Misuse, 44*, 1142-1159.

Masse, L. C., & Tremblay, R. E. (1997). Behavior of boys in kindergarten and the onset of substance use during adolescence. *Archives of General Psychiatry, 54*, 62-68.

McCormick, R. A., Dowd, E. T., Quirk, S., & Zegarra, J. H. (1998). The relationship of NEO-PI performance to coping styles, patterns of use, and triggers for use among substance abusers. *Addictive Behaviors, 23*(4), 497-507.

Merikangas, K. R., & Gelernter, C. S. (1990). Comorbidity for alcohol and depression. *The Psychiatric Clinics of North America, 13*(4), 613-632.

Merikangas, K. R., Mehta, R. L., Molnar, B. E., Walters, E. E., Swendsen, J. D., Aguilar-Gaziola, S., et al. (1998). Comorbidity of substance use disorders with mood and anxiety disorders: Results of the International Consortium in Psychiatry Epidemiology. *Addictive Behaviors, 23*(6), 893-907.

Miller, J. D., Pilkonis, P. A., & Clifton, A. (2005). Self- and other-reports of traits from the Five-Factor Model: Relations to personality disorder. *Journal of Personality Disorders, 19*(4), 400-419.

Miller, C. H., & Quick, B. L. (2010). Sensation seeking and psychological reactance as health risk predictors for an emerging adult population. *Health Communication, 25*, 266-275.

Mitchell, S. H. (1999). Measures of impulsivity in cigarette smokers and non-smokers. *Psychopharmacology, 146*, 455-464.

Mooi, E., Sarstedt, M. (2011). *A concise guide to market research: The process, data, and methods using IBM SPSS statistics*. Heidelberg, Germany: Springer.

Moore, T. H. M., Zammit, S., Lingford-Hughes, A., Barnes, T. R. E., Jones, P. B., Burke, M., et al. (2007). Cannabis use and risk of psychotic or affective mental health outcomes: A systematic review. *The Lancet, 370*, 319-328.

Morey, L. C. (1991). *Personality Assessment Inventory professional manual.* Odessa, FL: Personality Assessment Resources.

Morey, L. C. (1996). *An interpretive guide to the Personality Assessment Inventory (PAI).* Odessa, FL: Psychological Assessment Resources.

Morey, L. C. (2003). *Essentials of PAI assessment*. (A.S. Kaufman & N.L. Kaufman, Eds.). Hoboken, NJ: Wiley.

Morey, L. C. (2007). *Personality Assessment Inventory: Professional manual* (2nd ed.). Odessa, FL: Psychological Assessment Resources.

Moss, H. B., Chen, C. M., & Yi, H. (2007). Subtypes of alcohol dependence in a nationally representative sample. *Drug and Alcohol Dependence, 91*, 149-158.

Muthén, L. K., & Muthén, B. O. (2010). *Mplus user's guide* (6th ed.). Los Angeles, CA: Muthén & Muthén.

Neal D. J., & Carey, K. B. (2007). Association between alcohol intoxication and alcohol-related problems: An event-level analysis. *Psychology of Addictive Behaviors, 21*(2), 194-204.

O'Connor, B. P. (2005). A search for consensus on the dimensional structure of personality disorders. *Journal of Clinical Psychology*, *61*(3), 323-345.

Oldham, J. M., Skodol, A. E., Kellman, H. D., Hyler, S. E., Rosnick, L., & Davies, M. (1992). Diagnosis of *DSM-III-R* personality disorders by two structured interviews: Patterns of comorbidity. *American Journal of Psychiatry*, *149*(2), 213-220.

Oltmanns, T. F., Friedman, J. N. W., Fiedler, E. R., & Turkheimer, E. (2004). Perceptions of people with personality disorders based on thin slices of behavior. *Journal of Research in Personality*, *38*, 216-229.

Oltmanns, T. F., & Turkheimer, E. (2009). Person perception and personality pathology. *Current Directions in Psychological Science*, *18*(1), 32-36.

Oltmanns, T. F., Turkheimer, E., & Strauss, M. E. (1998). Peer assessment of personality traits and pathology in female college students. *Assessment*, *5*(1), 53-65.

O'Neil, K. A., Conner, B. T., & Kendall, P. C. (2011). Internalizing disorders and substance use disorders in youth: Comorbidity, risk, temporal order, and implications for intervention. *Clinical Psychology Review*, *31*, 104-112.

Pilkonis, P. A., Hallquist, M. N., Morse, J. Q., & Stepp, S. D. (2011). Striking the (im)proper balance between scientific advances and clinical utility: Commentary on the *DSM-5* proposal for personality disorders. *Personality Disorders: Theory, Research, and Treatment*, *2*(1), 68-82.

Pincus, A. L. (2011). Some comments on nomology, diagnostic process, and narcissistic personality disorder in the *DSM-5* proposal for personality and personality disorders. *Personality Disorders: Theory, Research, and Treatment*, *2*(1), 41-53.

Pomerleau, C. S., Pomerleau, O. F., Flessland, K. A., & Basson, S. M. (1992). Relationship of Tridimensional Personality Questionnaire scores and smoking variables in female and male smokers. *Journal of Substance Abuse, 4*, 143-154.

Putnins, A. L. (2006). Substance use among young offenders: Thrills, bad feelings, or bad behavior?. *Substance Use & Misuse*, *41*, 415-422.

Ravaja, N., & Keltikangas-Jarvinen, L. (2001). Cloninger's temperament and character dimensions in young adulthood and their relation to characteristics of parental alcohol use and smoking. *Journal of Studies on Alcohol*, *62*, 98-104.

Ray, L. A., Primack, J., Chelminski, I., Young, D., & Zimmerman, M. (2011). Diagnostic and clinical profiles of treatment-seeking men with and without substance use disorders. *Psychology of Men & Masculinity*, *12*, 158-165.

Rielage, J. K., Hoyt, T., & Renshaw, K. (2010). Internalizing and externalizing personality styles and psychopathology in OEF-OIF veterans. *Journal of Traumatic Stress*, *23*(3), 350-357.

Ronningstam, E. (2011). Narcissistic personality disorder in *DSM-5* – in support of retaining a significant diagnosis. *Journal of Personality Disorders*, *25*(2), 248-259.

Ruiz, M. A., Pincus, A. L., & Dickinson, K. A. (2003). NEO PI-R predictors of alcohol use and alcohol-related problems. *Journal of Personality Assessment*, *81*(3), 226-236.

Sartor, C. E., Lynskey, M. T., Heath, A. C., Jacob, T., & True, W. (2007). The role of childhood risk factors in initiation of alcohol use and progression to alcohol dependence. *Addiction*, *102*, 216-225.

Saucier, G. (2009). Recurrent personality dimensions in inclusive lexical studies: Indications for a big six structure. *Journal of Personality, 77*(5), 1577-1614.

Saulsman, L. M., & Page, A. C. (2004). The five-factor model and personality disorder empirical literature: A meta-analytic review. *Clinical Psychology Review, 23*, 1055-1085.

Scheier, L. M. (Ed.). (2010). *Handbook of drug use etiology: Theory, methods, and empirical findings*. Washington, DC: American Psychological Association.

Schuckit, M. A., Tipp, J. E., Smith, T. L., Shapiro, E., Hesselbrock, V. M., Bucholz, K. K., et al. (1995). An evaluation of type A and type B alcoholics. *Addiction, 90*, 1189-1203.

Scourfield, J., Stevens, D. E., & Merikangas, K. R. (1996). Substance abuse, comorbidity, and sensation seeking: Gender differences. *Comprehensive Psychiatry, 37*(6), 384-392.

Shea, M. T., Stout, R., Gunderson, J., Morey, L. C., Grilo, C. M., McGlashan, T., et al. (2002). Short-term diagnostic stability of schizotypal, borderline, avoidant, and obsessive-compulsive personality disorders. *American Journal of Psychiatry, 159*, 2036-2041.

Sher, K. J., Bartholow, B. D., & Wood, M. D. (2000). Personality and substance use disorders: A prospective study. *Journal of Consulting and Clinical Psychology, 68*(5), 818-829.

Simons, J. S., Gaher, R. M., Oliver, M. N. I., Bush, J. A., & Palmer, M. A. (2005). An experience sampling study of associations between affect and alcohol use and problems among college students. *Journal of Studies on Alcohol, 66*, 459-469.

Skodol, A. E., Clark, L. A., Bender, D. S., Krueger, R. F., Morey, L. C., Verheul, R., et al. Proposed changes in personality and personality disorder assessment and diagnosis for *DSM-5* part I: Description and rationale. *Personality Disorders: Theory, Research, and Treatment*, *2*(1), 4-22.

SPSS Inc. (2009). *PASW statistics base 18*. Chicago, IL: SPSS Inc.

Stewart, S. H., & Devine, H. (2000). Relations between personality and drinking motives in young adults. *Personality and Individual Differences*, *29*, 495-511.

Stewart, S. H., Loughlin, H. L., & Rhyno, E. (2001). Internal drinking motives mediate personality domain – drinking relations in young adults. *Personality and Individual Differences*, *30*, 271-286.

Swendsen, J. D., Merikangas, K. R., Canino, G. J., Kessler, R. C., Rubio-Stipec, M., & Angst, J. (1998). The comorbidity of alcoholism with anxiety and depressive disorders in four geographic communities. *Comprehensive Psychiatry*, *39*(4), 176-184.

Swendsen, J. D., Tennen, H., Carney, M. A., Affleck, G., Willard, A., & Hromi, A. (2000). Mood and alcohol consumption: An experience sampling test of the self-medication hypothesis. *Journal of Abnormal Psychology*, *109*(2), 198-204.

Tackett, J. L., Silberschmidt, A. L., Krueger, R. F., & Sponheim, S. R. (2008). A dimensional model of personality disorder: Incorporating *DSM* cluster A characteristics. *Journal of Abnormal Psychology*, *117*(2), 454-459.

Tapert, S. F., Baratta, M. V., Abrantes, A. M., & Brown, S. A. (2002). Attention dysfunction predicts substance involvement in community youths. *Journal of the American Academy of Child & Adolescent Psychiatry*, *41*, 680-686.

Teichman, M., Barnes, Z., & Rahav, G. (1989). Sensation seeking, state and trait anxiety, and depressive mood in adolescent substance users. *International Journal of the Addictions*, *24*(2), 87-99.

Tellegen, A. (1985). Structures of mood and personality and their relevance to assessing anxiety, with an emphasis on self-report. In A.H. Tuma & J. Maser (Eds.), *Anxiety and the anxiety disorders* (pp. 681-706). Hillsdale, NJ: Erlbaum.

Terman, L. M., & Oden, M. H. (1947). *Genetic studies of genius: IV. The gifted child grows up: Twenty-five years follow-up of a superior group.* Stanford, CA: Stanford University Press.

Terracciano, A., Lockenhoff, C. E., Crum, R. M., Bienvenu, O. J., & Costa, P. T., Jr. (2008). Five-Factor Model personality profiles of drug users. *BMC Psychiatry*, *8*, Article 22.

Thatcher, D. L., & Clark, D. B. (2010). Neurodevelopmental liability for adolescent substance use disorders. In L. M. Scheier (Ed.), *Handbook of drug use etiology: Theory, methods, and empirical findings* (pp. 209-224). Washington, DC: American Psychological Association.

Theakston, J. A., Stewart, S. H., Dawson, M. Y., Knowlden-Loewen, S. A. B., & Lehman, D. R. (2004). Big-Five personality domains predict drinking motives. *Personality and Individual Differences*, *37*, 971-984.

Thomas, C., Turkheimer, E., & Oltmanns, T. F. (2003). Factorial structure of pathological personality as evaluated by peers. *Journal of Abnormal Psychology*, *112*(1), 81-91.

Tournier, M., Sorbara, F., Gindre, C., Swendsen, J. D., Verdoux, H. (2003). Cannabis use and anxiety in daily life: A naturalistic investigation in a non-clinical population. *Psychiatry Research, 118,* 1-8.

Trull, T. J. (2005). Dimensional models of personality disorder: Coverage and cutoffs. *Journal of Personality Disorders, 19*(3), 262-282.

Tyrer, P. (2005). The problem of severity in the classification of personality disorder. *Journal of Personality Disorders, 19*(3), 309-314.

Van Ammers, E. C., Sellman, J. D., & Mulder, R. T. (1997). Temperament and substance abuse in schizophrenia: Is there a relationship?. *Journal of Nervous and Mental Disease, 185*(5), 283-288.

Vazire, S., & Mehl, M. R. (2008). Knowing me, knowing you: The accuracy and unique predictive validity of self-ratings and other-ratings of daily behavior. *Journal of Personality and Social Psychology, 95*(5), 1202-1216.

Verheul, R. (2005). Clinical utility of dimensional models for personality pathology. *Journal of Personality Disorders, 19*(3), 283-302.

Verheul, R., & Widiger, T. A. (2004). A meta-analysis of the prevalence and usage of the personality disorder not otherwise specified (PDNOS) diagnosis. *Journal of Personality Disorders, 18*(4), 309-319.

Von Knorring, L., Oreland, L., & von Knorring, A-L. (1987). Personality traits and platelet MAO activity in alcohol and drug abusing teenage boys. *Acta Psychiatrica Scandinavica, 75,* 307-314.

Vuchinich, R. E., & Simpson, C. A. (1998). Hyperbolic temporal discounting in social drinkers and problem drinkers. *Experimental and Clinical Psychopharmacology*, *6*(3), 292-305.

Vukov, M., Baba-Milkic, N., Lecic, D., Mijalkovic, S., & Marinkovic, J. (1995). Personality dimensions of opiate addicts. *Acta Psychiatrica Scandinavica*, *91*, 103-107.

Wagner, M. K. (2001). Behavioral characteristics related to substance abuse and risk-taking, sensation-seeking, anxiety sensitivity, and self-reinforcement. *Addictive Behaviors*, *26*, 115-120.

Walton, K. E., & Roberts, B. W. (2004). On the relationship between substance use and personality traits: Abstainers are not maladjusted. *Journal of Research in Personality*, *38*, 515-535.

Watson, D., Clark, L. A., & Chmieleswki, M. (2008). Structures of personality and their relevance to psychopathology: II. Further articulation of a comprehensive unified trait structure. *Journal of Personality*, *76*(6), 1545-1585.

Watson, D., Hubbard, B., & Wiese, D. (2000). Self-other agreement in personality and affectivity: The role of acquaintanceship, trait visibility, and assumed similarity. *Journal of Personality and Social Psychology*, *78*(3), 546-558.

Weiner, I. B., & Greene, R. L. (2008). *Handbook of personality assessment*. Hoboken, NJ: Wiley.

Widiger, T. A. (2011a). The *DSM-5* dimensional model of personality disorder: Rationale and empirical support. *Journal of Personality Disorders*, *25*(2), 222-234.

Widiger, T. A. (2011b). A shaky future for personality disorders. *Personality Disorders: Theory, Research, and Treatment*, *2*(1), 54-67.

Widiger, T. A., & Lowe, J. R. (2008). A dimensional model of personality disorder: Proposal for *DSM-5*. *Psychiatric Clinics of North America*, *31*(3), 363-378.

Widiger, T. A., & Simonsen, E. (2005a). Introduction to the special section: The American Psychiatric Association's research agenda for the *DSM-5*. *Journal of Personality Disorders*, *19*(2), 103-109.

Widiger, T. A., & Simonsen, E. (2005b). Alternative dimensional models of personality disorders: Finding a common ground. *Journal of Personality Disorders*, *19*(2), 110-130.

Widiger, T. A., Simonsen, E., Krueger, R., Livesley, W. J., & Verheul, R. (2005). Personality disorder research agenda for the *DSM-5*. *Journal of Personality Disorders*, *19*(3), 315-338.

Wilkinson, A. V., Shete, S., Spitz, M. R., & Swann, A. C. (2011). Sensation seeking, risk behaviors, and alcohol consumption among Mexican origin youth. *Journal of Adolescent Health*, *48*, 65-72.

Willem, L., Bijttebier, P., Claes, L., Sools, J., Vandenbussche, I., & Nigg, J. T. (2011). Temperamental characteristics of adolescents with substance abuse and/or dependence: A case-control study. *Personality and Individual Differences*, *50*, 1094-1098.

Wills, T. A., & Ainette, M. G. (2010). Temperament, self-control, and adolescent substance use: A two-factor model of etiological processes. In L. M. Scheier (Ed.), *Handbook of drug use etiology: Theory, methods, and empirical findings* (pp. 127-146). Washington, DC: American Psychological Association.

Wills, T. A., Gibbons, F. X., Sargent, J. D., Gerrard, M., Lee, H.-R., & Dal Cin, S. (2010). Good self-control moderates the effect of mass media on adolescent tobacco and alcohol use: Tests with studies of children and adolescents. *Health Psychology*, *29*(5), 539-549.

Wills, T. A., Vaccaro, D., & McNamara, G. (1994). Novelty seeking, risk taking, and related constructs as predictors of adolescent substance use: An application of Cloninger's theory. *Journal of Substance Abuse*, *6*, 1-20.

Wills, T. A., Walker, C., Mendoza, D., & Ainette, M. G. (2006). Behavioral and emotional self-control: Relations to substance use in samples of middle and high school students. *Psychology of Addictive Behaviors*, *20*(3), 265-278.

Wills, T. A., Windle, M., Cleary, S. D. (1998). Temperament and novelty seeking in adolescent substance use: Convergence of dimensions of temperament with constructs from Cloninger's theory. *Journal of Personality and Social Psychology*, *74*(2), 387-406.

Windle, M., & Scheidt, D. M. (2004). Alcoholic subtypes: Are two sufficient?. *Addiction*, *99*, 1508-1519.

Wolf, A. W., Schubert, D. S. P., Patterson, M. B., Grande, T. P., Brocco, K. J., & Pendleton, L. (1988). Associations among major psychiatric diagnoses. *Journal of Consulting and Clinical Psychology*, *56*(2), 292-294.

Wulfert, E., Block, J. A., Ana, E. S., Rodriguez, M. L., & Colsman, M. (2002). Delay of gratification: Impulsive choices and problem behaviors in early and late adolescence. *Journal of Personality, 70*(4), 533-552.

Yang, M., Coid, J., & Tyrer, P. (2010). Personality pathology recorded by severity: National survey. *British Journal of Psychiatry, 197*, 193-199.

Young, T. Y., & Mayer, W. R. (2010). *Brief Assessment of Traits - 37*. Unpublished manuscript, Department of Psychology and Behavioral Sciences, Louisiana Tech University, Ruston, Louisiana.

Zanarini, M. C., Frankenburg, F. R., Hennen, J., Reich, B., & Silk, K. R. (2005). The McLean Study of Adult Development (MSAD): Overview and implications of the first six years of prospective follow-up. *Journal of Personality Disorders, 19*(5), 505-523.

Zimmerman, M. (2011). Is there adequate empirical justification for radically revising the personality disorders section for *DSM-5*?. *Personality Disorders: Theory, Research, and Treatment*. Advance online publication. doi: 10.1037/a0022108

Zimmerman, M., Rothschild, L., & Chelminski, I. (2005). The prevalence of *DSM-IV* personality disorders in psychiatric outpatients. *The American Journal of Psychiatry, 162*(10), 1911-1918.

Zuckerman, M. (1979). *Sensation seeking: Beyond the optimal level of arousal*. Hillsdale, NJ: Erlbaum.

Zuckerman, M. (2007). *Sensation seeking and risky behavior*. Washington, DC: American Psychological Association.

Zuckerman, M., & Cloninger, C. R. (1996). Relationships between Cloninger's, Zuckerman's, and Eysenck's dimensions of personality. *Personality and Individual Differences*, *21*(2), 283-285.

Zuckerman, M. Kuhlman, D. M., Joireman, J., Teta, P., & Kraft, M. (1993). A comparison of three structural models for personality: The Big Three, the Big Five, and the Alternate Five. *Journal of Personality and Social Psychology*, *65*(4), 757-768.

APPENDIX A

PILOT STUDY *DSM-5* SURVEY FORMS

BRIEF ASSESSMENT OF TRAITS – 37

Instructions: You will see several clusters of three related statements. Please indicate how well each of the clusters describes you. Circle the corresponding number according to the key below.

0 = Does not describe me at all
1 = Mildly describes me
2 = Moderately describes me
3 = Describes me extremely well

I...

1. am emotionally intense get upset very easily have big mood swings	0	1	2	3	12. feel "disconnected" from the world stay distant from others am not interested in world affairs	0	1	2	3
2. am often nervous worry a lot often feel "on edge"	0	1	2	3	13. have very few close friends avoid romantic relationships don't want to be close to others	0	1	2	3
3. do what others tell me to do "follow" others don't like making decisions	0	1	2	3	14. don't show emotions seem "too calm" to people don't get upset or excited when others would	0	1	2	3
4. don't like being alone am not independent am afraid of rejection by significant others	0	1	2	3	15. don't have much enjoyment am not made happy by anything have little interest in anything	0	1	2	3
5. am pessimistic expect the worst focus on the negative	0	1	2	3	16. don't feel bad about hurting others don't care about others' problems don't care about people's feelings	0	1	2	3
6. have low self-esteem feel that I am worthless believe I can't do anything right	0	1	2	3	17. use people to get what I want manipulate people can be charming to get what I want	0	1	2	3
7. feel guilty often blame myself a lot feel guilty for no real reason	0	1	2	3	18. think I deserve special treatment am self-centered have a high opinion of myself	0	1	2	3
8. cut or harm myself on purpose think about suicide threaten suicide	0	1	2	3	19. like being the center of attention show off to others like showy clothing and jewelry	0	1	2	3
9. feel "down" often almost always feels depressed don't "bounce back" from bad moods	0	1	2	3	20. get mad easily have a "hot temper" get overly angry about little things	0	1	2	3
10. don't trust others am suspicious of others think others want to harm me	0	1	2	3	21. intimidate other people am aggressive can be verbally or physically abusive	0	1	2	3
11. prefer to be alone dislike most social events am quiet around most other people	0	1	2	3	22. don't cooperate with others resist following rules have problems with authority figures	0	1	2	3

23. tell a lot of lies make things up when telling stories am often dishonest	0	1	2	3	31. need everything to be in order like details, lists, and schedules dislike when anything is out of place	0	1	2	3
24. do things without thinking act on the "spur of the moment" am impulsive	0	1	2	3	32. avoid anything that's risky almost never take chances am very careful not to get injured or sick	0	1	2	3
25. get distracted easily have difficulty concentrating have trouble paying attention for long	0	1	2	3	33. have unusual sensations hear things that no one else can hear feel things that other people don't feel	0	1	2	3
26. take risks do dangerous things sometimes get bored easily	0	1	2	3	34. have very strange thoughts sometimes have unusual views of reality have very odd beliefs	0	1	2	3
27. am not responsible do not keep promises don't follow through with commitments	0	1	2	3	35. say and do things that are very odd seem strange to other people dress in unusual or inappropriate ways	0	1	2	3
28. am a perfectionist want everything to be flawless have extremely high standards	0	1	2	3	36. have thoughts that are hard to follow have thoughts that are disorganized have thoughts that are hard to understand	0	1	2	3
29. talk about things over and over can't seem to "let things go" get obsessed with certain topics	0	1	2	3	37. act like my surroundings are strange feel detached from reality at times sometimes feel like I'm in a daze	0	1	2	3
30. believe "my way" is the right way don't like changing my routine can't be convinced to change my mind	0	1	2	3					

BRIEF ASSESSMENT OF TRAITS – 37

Instructions: Please indicate how well each of the statements below describes you. Circle the corresponding number according to the key below.

0 = Does not describe me at all
1 = Mildly describes me
2 = Moderately describes me
3 = Describes me extremely well

I...

1. am emotionally intense	0	1	2	3
2. am often nervous	0	1	2	3
3. do what others tell me to do	0	1	2	3
4. don't like being alone	0	1	2	3
5. am pessimistic	0	1	2	3
6. have low self-esteem	0	1	2	3
7. feel guilty often	0	1	2	3
8. cut or harm myself on purpose	0	1	2	3
9. feel "down" often	0	1	2	3
10. don't trust others	0	1	2	3
11. prefer to be alone	0	1	2	3
12. feel "disconnected" from the world	0	1	2	3
13. have very few close friends	0	1	2	3
14. don't show emotions	0	1	2	3
15. don't have much enjoyment	0	1	2	3
16. don't feel bad about hurting others	0	1	2	3
17. use people to get what I want	0	1	2	3
18. think I deserve special treatment	0	1	2	3
19. like being the center of attention	0	1	2	3
20. get mad easily	0	1	2	3
21. intimidate other people	0	1	2	3
22. don't cooperate with others	0	1	2	3
23. tell a lot of lies	0	1	2	3
24. do things without thinking	0	1	2	3
25. get distracted easily	0	1	2	3
26. take risks	0	1	2	3
27. am not responsible	0	1	2	3

28. am a perfectionist	0	1	2	3
29. talk about things over and over	0	1	2	3
30. believe "my way" is the right way	0	1	2	3
31. need everything to be in order	0	1	2	3
32. avoid anything that's risky	0	1	2	3
33. have unusual sensations	0	1	2	3
34. have very strange thoughts sometimes	0	1	2	3
35. say and do things that are very odd	0	1	2	3
36. have thoughts that are hard to follow	0	1	2	3
37. act like my surroundings are strange	0	1	2	3
38. get upset very easily	0	1	2	3
39. worry a lot	0	1	2	3
40. "follow" others	0	1	2	3
41. am not independent	0	1	2	3
42. expect the worst	0	1	2	3
43. feel that I am worthless	0	1	2	3
44. blame myself a lot	0	1	2	3
45. think about suicide	0	1	2	3
46. almost always feels depressed	0	1	2	3
47. am suspicious of others	0	1	2	3
48. dislike most social events	0	1	2	3
49. stay distant from others	0	1	2	3
50. avoid romantic relationships	0	1	2	3
51. seem "too calm" to people	0	1	2	3
52. am not made happy by anything	0	1	2	3
53. don't care about others' problems	0	1	2	3
54. manipulate people	0	1	2	3

55. am self-centered	0	1	2	3
56. show off to others	0	1	2	3
57. have a "hot temper"	0	1	2	3
58. am aggressive	0	1	2	3
59. resist following rules	0	1	2	3
60. make things up when telling stories	0	1	2	3
61. act on the "spur of the moment"	0	1	2	3
62. have difficulty concentrating	0	1	2	3
63. do dangerous things sometimes	0	1	2	3
64. do not keep promises	0	1	2	3
65. want everything to be flawless	0	1	2	3
66. can't seem to "let things go"	0	1	2	3
67. don't like changing my routine	0	1	2	3
68. like details, lists, and schedules	0	1	2	3
69. almost never takes chances	0	1	2	3
70. hear things that no one else can hear	0	1	2	3
71. have unusual views of reality	0	1	2	3
72. seem strange to other people	0	1	2	3
73. have thoughts that are disorganized	0	1	2	3
74. feel detached from reality at times	0	1	2	3
75. have big mood swings	0	1	2	3
76. often feel "on edge"	0	1	2	3
77. don't like making decisions	0	1	2	3
78. am afraid of rejection by significant others	0	1	2	3
79. focus on the negative	0	1	2	3
80. believe I can't do anything right	0	1	2	3
81. feel guilty for no real reason	0	1	2	3
82. threaten suicide	0	1	2	3
83. don't "bounce back" from bad moods	0	1	2	3
84. think others want to harm me	0	1	2	3
85. am quiet around most other people	0	1	2	3
86. am not interested in world affairs	0	1	2	3
87. don't want to be close to others	0	1	2	3
88.don't get upset or excited when others would	0	1	2	3
89. have little interest in anything	0	1	2	3
90. don't care about people's feelings	0	1	2	3
91. can be charming to get what I want	0	1	2	3
92. have a high opinion of myself	0	1	2	3
93. like showy clothing and jewelry	0	1	2	3
94. get overly angry about little things	0	1	2	3
95. can be verbally or physically abusive	0	1	2	3
96. have problems with authority figures	0	1	2	3
97. am often dishonest	0	1	2	3
98. am impulsive	0	1	2	3
99. have trouble paying attention for long	0	1	2	3
100. get bored easily	0	1	2	3
101. don't follow through with commitments	0	1	2	3
102. have extremely high standards	0	1	2	3
103. get obsessed with certain topics	0	1	2	3
104. can't be convinced to change my mind	0	1	2	3
105. dislike when anything is out of place	0	1	2	3
106. am very careful not to get injured or sick	0	1	2	3
107. feel things that other people don't feel	0	1	2	3
108. have very odd beliefs	0	1	2	3
109. dress in unusual or inappropriate ways	0	1	2	3
110. have thoughts that are hard to understand	0	1	2	3
111. sometimes feel like I'm in a daze	0	1	2	3

APPENDIX B

CLIENT-REPORT BAT37

BRIEF ASSESSMENT OF TRAITS – 37

Instructions: On each page, you will see clusters of three related statements. Please indicate how well each of the clusters describes you over the past few months by circling the corresponding number (see the key below).

0 = Does not describe me at all
1 = Mildly describes me
2 = Moderately describes me
3 = Describes me extremely well

When I'm having a problem with drugs and/or alcohol, I...

1. am emotionally intense get upset very easily have big mood swings	0	1	2	3	13. have very few close friends avoid romantic relationships don't want to be close to others	0	1	2	3
2. am often nervous worry a lot often feel "on edge"	0	1	2	3	14. don't show emotions seem "too calm" to people don't get upset or excited when others would	0	1	2	3
3. do what others tell me to do "follow" others don't like making decisions	0	1	2	3	15. don't have much enjoyment am not made happy by anything have little interest in anything	0	1	2	3
4. don't like being alone am not independent am afraid of rejection by significant others	0	1	2	3	16. don't feel bad about hurting others don't care about others' problems don't care about people's feelings	0	1	2	3
5. am pessimistic expect the worst focus on the negative	0	1	2	3	17. use people to get what I want manipulate people can be charming to get what I want	0	1	2	3
6. have low self-esteem feel that I am worthless believe I can't do anything right	0	1	2	3	18. think I deserve special treatment am self-centered have a high opinion of myself	0	1	2	3
7. feel guilty often blame myself a lot feel guilty for no real reason	0	1	2	3	19. like being the center of attention show off to others like showy clothing and jewelry	0	1	2	3
8. cut or harm myself on purpose think about suicide have threatened suicide	0	1	2	3	20. get mad easily have a "hot temper" get overly angry about little things	0	1	2	3
9. feel "down" often almost always feel depressed don't "bounce back" from bad moods	0	1	2	3	21. intimidate other people am aggressive can be verbally or physically abusive	0	1	2	3
10. don't trust others am suspicious of others think others want to harm me	0	1	2	3	22. don't cooperate with others resist following rules have problems with authority figures	0	1	2	3
11. prefer to be alone dislike most social events am quiet around most other people	0	1	2	3	23. tell a lot of lies make things up when telling stories am often dishonest	0	1	2	3
12. feel "disconnected" from the world stay distant from others am not interested in world affairs	0	1	2	3	24. do things without thinking act on the "spur of the moment" am impulsive	0	1	2	3

25. get distracted easily have difficulty concentrating have trouble paying attention for long	0	1	2	3	32. avoid anything that is risky almost never take chances am very careful not to get injured or sick	0	1	2	3
26. take risks do dangerous things sometimes get bored easily	0	1	2	3	33. have unusual sensations hear things that no one else can hear feel things that other people don't feel	0	1	2	3
27. am not responsible do not keep promises don't follow through with commitments	0	1	2	3	34. have very strange thoughts sometimes have unusual views of reality have very odd beliefs	0	1	2	3
28. am a perfectionist want everything to be flawless have extremely high standards	0	1	2	3	35. say and do things that are very odd seem strange to other people dress in unusual or inappropriate ways	0	1	2	3
29. talk about things over and over can't seem to "let things go" get obsessed with certain topics	0	1	2	3	36. have thoughts that are hard to follow have thoughts that are disorganized have thoughts that are hard to understand	0	1	2	3
30. believe "my way" is the right way don't like changing my routine can't be convinced to change my mind	0	1	2	3	37. often feel like my surroundings are strange feel detached from reality at times sometimes feel in a daze	0	1	2	3
31. need everything to be in order like details, lists, and schedules dislike when anything is out of place	0	1	2	3					

<u>INSTRUCTIONS</u> If you believe that you have a problem with alcohol or drugs, in the space below please write an estimate of your age when you began regularly using alcohol and/or drugs (not including tobacco). Then below indicate how well each of the clusters describes you at the age that you specify. If you do not believe you have a problem with drugs or alcohol, you may skip the following section.

What was the most recent age *<u>BEFORE</u>* you began *<u>REGULARLY</u>* using alcohol and/or drugs? _____

0 = Does not describe me at all
1 = Mildly describes me
2 = Moderately describes me
3 = Describes me extremely well

<u>BEFORE</u> I ever began <u>REGULARLY</u> using, I...

1. was emotionally intense got upset very easily had big mood swings	0	1	2	3	6. had low self-esteem felt that I was worthless believed I couldn't do anything right	0	1	2	3
2. was often nervous worried a lot often felt "on edge"	0	1	2	3	7. felt guilty often blamed myself a lot felt guilty for no real reason	0	1	2	3
3. did what others told me to do "followed" others didn't like making decisions	0	1	2	3	8. cut or harmed myself on purpose thought about suicide threatened suicide	0	1	2	3
4. didn't like being alone was not independent was afraid of rejection by significant others	0	1	2	3	9. felt "down" often almost always felt depressed didn't "bounce back" from bad moods	0	1	2	3
5. was pessimistic expected the worst focused on the negative	0	1	2	3	10. didn't trust others was suspicious of others thought others wanted to harm me	0	1	2	3

11. preferred to be alone disliked most social events was quiet around most other people	0	1	2	3
12. felt "disconnected" from the world stayed distant from others was not interested in world affairs	0	1	2	3
13. had very few close friends avoided romantic relationships didn't want to be close to others	0	1	2	3
14. didn't show emotions seemed "too calm" to people didn't get upset or excited when others would	0	1	2	3
15. didn't have much enjoyment wasn't made happy by anything had little interest in anything	0	1	2	3
16. didn't feel bad about hurting others didn't care about others' problems didn't care about people's feelings	0	1	2	3
17. used people to get what I wanted manipulated people could be charming to get what I wanted	0	1	2	3
18. thought I deserved special treatment was self-centered had a high opinion of myself	0	1	2	3
19. liked being the center of attention showed off to others liked showy clothing and jewelry	0	1	2	3
20. got mad easily had a "hot temper" got overly angry about little things	0	1	2	3
21. intimidated other people was aggressive could be verbally or physically abusive	0	1	2	3
22. didn't cooperate with others resisted following rules had problems with authority figures	0	1	2	3
23. told a lot of lies made things up when telling stories was often dishonest	0	1	2	3
24. did things without thinking acted on the "spur of the moment" was impulsive	0	1	2	3
25. got distracted easily had difficulty concentrating had trouble paying attention for long	0	1	2	3
26. took risks did dangerous things sometimes got bored easily	0	1	2	3
27. was not responsible did not keep promises didn't follow through with commitments	0	1	2	3
28. was a perfectionist wanted everything to be flawless had extremely high standards	0	1	2	3
29. talked about things over and over couldn't seem to "let things go" got obsessed with certain topics	0	1	2	3
30. believed "my way" was the right way didn't like changing my routine couldn't be convinced to change my mind	0	1	2	3
31. needed everything to be in order liked details, lists, and schedules disliked when anything was out of place	0	1	2	3
32. avoided anything that was risky almost never took chances was very careful not to get sick or injured	0	1	2	3
33. had unusual sensations heard things that no one else could hear felt things that other people didn't feel	0	1	2	3
34. had very strange thoughts sometimes had unusual views of reality had very odd beliefs	0	1	2	3
35. said and did things that were very odd seemed strange to other people dressed in unusual or inappropriate ways	0	1	2	3
36. had thoughts that were hard to follow had thoughts that were disorganized had thoughts that were hard to understand	0	1	2	3
37. often felt like my surroundings were strange felt detached from reality at times sometimes felt in a daze	0	1	2	3

APPENDIX C

HUMAN USE COMMITTEE APPROVAL FORMS

LOUISIANA TECH
UNIVERSITY

MEMORANDUM

OFFICE OF UNIVERSITY RESEARCH

TO: Mr. Reese Mayer and Dr. Tony Young

FROM: Barbara Talbot, University Research

SUBJECT: HUMAN USE COMMITTEE REVIEW

DATE: September 27, 2010

In order to facilitate your project, an EXPEDITED REVIEW has been done for your proposed study entitled:

"Personality and Substance Use"

 # HUC-791

The proposed study's revised procedures were found to provide reasonable and adequate safeguards against possible risks involving human subjects. The information to be collected may be personal in nature or implication. Therefore, diligent care needs to be taken to protect the privacy of the participants and to assure that the data are kept confidential. Informed consent is a critical part of the research process. The subjects must be informed that their participation is voluntary. It is important that consent materials be presented in a language understandable to every participant. If you have participants in your study whose first language is not English, be sure that informed consent materials are adequately explained or translated. Since your reviewed project appears to do no damage to the participants, the Human Use Committee grants approval of the involvement of human subjects as outlined.

Projects should be renewed annually. ***This approval was finalized on Septiember 27, 2010 and this project will need to receive a continuation review by the IRB if the project, including data analysis, continues beyond September 27, 2011.*** Any discrepancies in procedure or changes that have been made including approved changes should be noted in the review application. Projects involving NIH funds require annual education training to be documented. For more information regarding this, contact the Office of University Research.

You are requested to maintain written records of your procedures, data collected, and subjects involved. These records will need to be available upon request during the conduct of the study and retained by the university for three years after the conclusion of the study. If changes occur in recruiting of subjects, informed consent process or in your research protocol, or if unanticipated problems should arise it is the Researchers responsibility to notify the Office of Research or IRB in writing. The project should be discontinued until modifications can be reviewed and approved.

If you have any questions, please contact Dr. Mary Livingston at 257-4315.

LOUISIANA TECH
UNIVERSITY

OFFICE OF UNIVERSITY RESEARCH

MEMORANDUM

TO: Ms. Reese Mayer and Dr. Tony Young

FROM: Barbara Talbot, University Research

SUBJECT: Human Use Committee Review

DATE: September 22, 2011

RE: Approved Continuation of Study HUC 791

TITLE: **"Personality and Substance Use"**

HUC 791 Renewal

The above referenced study has been approved as of September 22, 2011 as a continuation of the original study that received approval on September 27, 2010. **This project will need to receive a continuation review by the IRB if the project, including collecting or analyzing data, continues beyond September 22, 2012.** Any discrepancies in procedure or changes that have been made including approved changes should be noted in the review application. Projects involving NIH funds require annual education training to be documented. For more information regarding this, contact the Office of University Research.

You are requested to maintain written records of your procedures, data collected, and subjects involved. These records will need to be available upon request during the conduct of the study and retained by the university for three years after the conclusion of the study. If changes occur in recruiting of subjects, informed consent process or in your research protocol, or if unanticipated problems should arise it is the Researchers responsibility to notify the Office of Research or IRB in writing. The project should be discontinued until modifications can be reviewed and approved.

If you have any questions, please contact Dr. Mary Livingston at 257-4315.

APPENDIX D

HUMAN SUBJECTS CONSENT FORMS

HUMAN SUBJECTS CONSENT FORM

The following is a brief summary of the project in which you are asked to participate. Please read this information before signing the statement below.

TITLE: Personality Form Pilot Study

PURPOSE OF STUDY/PROJECT: The purpose of this study is to examine your personality traits and to invite your comments about the understandability of the form that you will complete.

PROCEDURE: Prior to participation, you must sign an informed consent form. After consent forms are signed, you will be asked to complete a brief survey which will take approximately 10 minutes. There is a comments section at the end of the survey in which you are invited to share anything that you found confusing about the survey. Surveys and informed consent forms will be collected separately.

INSTRUMENTS: The survey includes several clusters of related personality characteristics, and you will be asked to rate how well the clusters of characteristics describe you. Please follow instructions.

RISKS/ALTERNATIVE TREATMENTS: The participant understands that Louisiana Tech is not able to offer financial compensation nor to absorb the costs of medical treatment should you be injured as a result of participating in this research.

BENEFITS/COMPENSATION: Some participants may be offered extra credit in their class for participation. If extra credit is offered by your instructor for participating in this research, an alternative extra credit assignment that requires a similar investment of time and energy will also be offered to those students who do not choose to volunteer as research subjects.

I, _____, attest with my signature that I have read and understood the following description of the study, "Personality Form Pilot Study", and its purposes and methods. I understand that my participation in this research is strictly voluntary and my participation or refusal to participate in this study will not affect my relationship with Louisiana Tech University or the Palmetto Addiction Recovery Center. Further, I understand that I may withdraw at any time or refuse to answer any questions without penalty. Upon completion of the study, I understand that the results will be freely available to me upon request. I understand that the results of my survey will be confidential, accessible only to the principal investigators, myself, or a legally appointed representative. I have not been requested to waive nor do I waive any of my rights related to participating in this study.

_____ _____

Signature of Participant **Date**

CONTACT INFORMATION:
The principal experimenters listed below may be contacted to answer questions about the research, participant rights, or related matters:

PROJECT DIRECTOR(S): W. Reese Mayer, M.A., and Tony Young, Ph.D.
EMAIL: wrm008@latech.edu, tyoung@latech.edu
PHONE: 318-257-3413

Members of the Human Use Committee of Louisiana Tech University may also be contacted if a problem cannot be discussed with the experimenters:

Dr. Les Guice: 318-257-3056
Dr. Mary M. Livingston: 318-257-2292 or 318-257-4315

HUMAN SUBJECTS CONSENT FORM

The following is a brief summary of the project in which you are asked to participate. Please read this information before signing the statement below.

TITLE: Personality and Substance Use

PURPOSE OF STUDY/PROJECT: The purpose of this study is to examine the relationship between personality traits and substance use.

PROCEDURE: You will be asked to complete a brief survey which will take approximately 10 minutes. In this survey, you will be asked to describe general information about your personality both before and during your substance use. Additionally, corresponding surveys will be administered to the following people: one or more clients at PARC who are familiar with you, a treatment provider of yours at PARC, and your significant other and/or family members who visit you at PARC. The other client and treatment provider of yours will be asked to describe general information about your current personality traits, and your significant other and/or family members who visit you will be asked to describe your personality traits during and, if applicable, before your substance use. Information provided in each of the surveys will remain entirely confidential and the responses of you, the other client, your treatment provider, and your significant other and/or family members will be used for research purposes only and will not affect the course of your treatment at PARC in any way.

INSTRUMENTS: The survey includes several clusters of related personality characteristics, and you will be asked to rate how well the clusters of characteristics describe you. Please follow instructions.

RISKS/ALTERNATIVE TREATMENTS: The participant understands that Louisiana Tech is not able to offer financial compensation nor to absorb the costs of medical treatment should you be injured as a result of participating in this research.

BENEFITS/COMPENSATION: None.

I, _____, attest with my signature that I have read and understood the description of the study, "Personality and Substance Use", and its purposes and methods. I understand that my participation in this research is entirely voluntary. I understand that I may withdraw at any time or refuse to answer any questions without penalty. Further, I understand that by signing this form I am allowing one or more other PARC clients, a treatment provider of mine at PARC, and my significant other and/or family members who visit me at PARC to provide general descriptions of me for the purposes of this study. I understand that the specific responses of any other individuals who respond to items pertaining to me will not be available to me, but that upon completion of the study a summary of the results will be freely available to me upon request. I understand that my own survey responses will be confidential, accessible only to the principal investigators, myself, or a legally appointed representative. I have not been requested to waive nor do I waive any of my rights related to participating in this study.

_____ _____

Signature of Participant **Date**

CONTACT INFORMATION:

The principal experimenters listed below may be contacted to answer questions about the research, participant rights, or related matters:

PROJECT DIRECTOR(S): W. Reese Mayer, M.A., and Tony Young, Ph.D.
EMAIL: wrm008@latech.edu or tyoung@latech.edu
PHONE: 318-257-3413

Members of the Human Use Committee of Louisiana Tech University may also be contacted if a problem cannot be discussed with the experimenters:

Dr. Les Guice: 318-257-3056
Dr. Mary M. Livingston: 318-257-2292 or 318-257-4315