Delving Deeper into Substance Use: Affect Regulation, Defenses, and Personality Factors Influencing Drug Choice in Addictions

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Abstract

According to E. J. Khantzian's (2003) theory of Self-Medication, substance addiction functions as a compensatory means to modulate affects and self-soothe in response to distressing psychological states. Khantzian's theory has two main components: 1) addictive drugs become addicting because they have the power to alleviate, remove, or change (and in turn control) human psychological suffering, and 2) there is a considerable degree of specificity in a person's choice of drugs, and individuals gravitate to a certain drug because of its psychological and physiological effects (Khantzian & Albanese, 2008). This project tests the tenets of Khantzian's (2003) Self-Medication theory in a treatment sample of addicts (N = 304), using content and supplementary scales of the MMPI-2, the PAI, and YSQ. Using an algorithm based on medical records, addicted individuals were reliably classified as being either addicted to a Depressant, Stimulant, or Opiate. Based on Self-Medication theory, I predicted the three groups would function in different ways across combinations of the following variables: Subjective Depression, Psychomotor Acceleration, Post-Traumatic Stress, Over-controlled Hostility, Cynicism, Aggression, Paranoia, Antisocial Tendencies, Emotional Inhibition, Insufficient-Self Control, and Ego Strength. I used MANOVAs to test three theory-driven hypotheses regarding drug group differences on the personality variables. The MANOVAs for hypothesis I (Depressant versus all other addicts) and hypothesis II (Opiate versus other) were statistically significant. The MANOVA for hypothesis III (stimulant versus other) was non-significant. Across the three hypotheses, there were 18 a priori Univariate predictions. Of these, 17 were in the predicted direction, nine were statistically significant. These multivariate and Univariate

findings partially support the Self-Medication theory, particularly in its characterization of personality functioning of those addicted to Depressants and Opiates.

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The All-Encompassing Problem of Addiction

Among the most prevalent of psychiatric disorders in the United States, Alcohol and Substance Use Disorders (AUD/SUD) represent a costly public health problem in the U.S. and other industrialized countries (Barlow, 2008). According to recent national drug and alcohol surveys, 8.5% of adult Americans (17.6 million individuals) suffer from DSM-IV defined alcohol abuse or dependence, 9.1% (22.2 million individuals) meet criteria for a drug abuse or dependence disorder, and 2.6 million meet criteria for alcoholism/addiction (Grant, Dawson, Stinson, Chou, Dufour, & Pickering, 2006; SAMSHA, 2006; Stinson, Grant, Dawson, Ruan, Huang, & Saha, 2006). Problems associated with substance use disorders permeate beyond the individual, negatively affecting not only a person's cognition and physical health, but also their interpersonal relationships, their workplace, their immediate social environment, and the criminal justice system as a whole (Barlow, 2008). The World Health Organization estimates substance dependence to cause nearly 4% of all deaths worldwide due to the crime and violence surrounding use, factoring into 20-30% of homicides, causing more motor vehicle accidents, and producing health conditions such as epilepsy, liver cancer, cirrhosis of the liver, cardiovascular disease, fetal alcohol syndrome, and esophageal cancer (World Health Organization, 2007; National Institute of Justice, 2000). Drug dependence also catalyzes the spread of HIV/AIDS and hepatitis, with more than 10% of infections worldwide resulting from the use of contaminated needles (UN Office on Drugs and Crime, 2006). Vocationally, substance misuse directly affects work productivity levels, school dropout or work absenteeism, and disability in the American workplace (UN Office of Drugs and Crime, 2006; Hawkins, Catalano, & Miller, 1992; Goetzel, Hawkins, Ozminkowski, & Wang, 2003; Hollingworth, Ebel, McCarty, Garrison,

Christakis, & Rivara, 2006; Rivara, Garrison, Ebel, McCarty, & Christakis, 2004). Substance dependence subjects families to physical and emotional pain, causing higher rates of familial distress, child abuse, domestic violence, and interpersonal violence (Leonard, 2001; WHO, 2007). With all of this taken into consideration, fiscally, alcohol and substance use problems cost the United States $185 and $500 billion each year (Office of National Drug Control Policy, 2004).

Vulnerability to Addiction

Parent-child interactions, peer influences, personality factors, environment, and genetic aspects have all been found to contribute to the onset of addiction (Winger et al., 2004). Researchers have categorized addiction vulnerabilities as genetic, personal, and environmental (Hosselbrock & Hosselbrock, 2004). Family pedigree, twin, and adoption studies provide significant evidence of an increased risk for developing substance use problems when a biological parent is substance dependent, demonstrating a 50-60% heritability rate of drug and alcohol dependence in families (Hosselbrock & Hosselbrock, 2004; Hasin, Hatzenbuehler, & Waxman, 2004; Biederman, Faraone, Monuteaux, & Feighner, 2000; Prescott, Aggen, & Kendler, 1999; Krishnan-Sarin, 2000). Parental addiction also creates environmental risks for children, such as poorer parenting styles, childhood maltreatment, the increased availability of drugs in the home, higher levels of parental psychopathology, lower socioeconomic status, and children developing more academic and social problems (Biederman et al., 2000; Hosselbrock & Hosselbrock, 2004). The hostile, neglectful, abusive, and/or chaotic family environments perpetuated by drug use negatively influences developmental deficits in ego and self-

organization shown by addicts later in life, which significantly increases the chance of an individual developing an addictive disorder (PDM Task Force, 2006; Al-Absi, 2009; Kendler et al., 2000; Widom, Weiler, & Cottler, 1999). Other environmental vulnerabilities influencing the likelihood of AUD/SUD development include peer influences and stressful and negative life events (Hosselbrock & Hosselbrock, 2004). Regarding personal and psychological functioning, studies have connected behavioral under-control/poor inhibition, decreased organizational/task-oriented functioning, and negative affectivity in temperament to the development of an AUD/SUD (Hosselbrock & Hosselbrock, 2004). Also, researchers have widely documented the incidence of childhood pathology such as conduct problems, antisocial traits, and oppositionality as risk factors for externalizing problems such as SUDs (Slutske et al., 1998; Cloninger & Gottesman, 1987; Jacobson et al., 2000) As well as genetic, personal and environmental risk-factors for addiction, individuals also differ in some areas of demographics.

Gender differences exist in AUD/SUDs, with males drinking more and displaying more antisocial behavior than women, and females manifesting more depression/anxiety symptoms associated with substance use (Milani, Parrott, Turner, & Fox, 2004; Brady & Randall, 1999; Cornelius et al., 1995). Recent research postulates that these trends appear to be declining among recent birth cohorts (Hosselbrock & Hosselbrock, 2004). By age, it appears that younger individuals gravitate to cannabis, and older individuals more to alcohol and crack (Gerra et al., 2008). Regarding racial differences, African-Americans more frequently use crack and marijuana, whereas Hispanics are more frequent users of alcohol, cocaine, and marijuana (Gerra et al., 2008). Religiosity buffers risk for addiction, with personal devotion, belonging to an

institution, and weekly church attendance negatively associated with substance use disorders (Kendler et al., 1997; Heath, 1997)

Comorbidity and Addiction:

Co-morbidity studies demonstrate that over three-fourths of people treated for alcohol or drug related problems have other mental health problems (Weaver et al., 2002). Co-morbidity is extremely challenging to reliably detect in treatment settings, especially when researchers seem preoccupied by causation when it comes to psychiatric issues and addiction. Discernment of mental health problems is difficult to accomplish without longitudinal study—withdrawal can mimic a psychiatric disorder, drug use may mask and mimic psychiatric symptoms, untreated dependence can lead to recurrence of psychiatric symptoms, and untreated psychiatric conditions can lead to drug/alcohol dependence (Rassool, 2009). Multinational studies show a continuous relationship between co-morbidity and addictions, indicating more psychiatric issues produce greater severity of substance use problems (Merikangas et al., 1998). Treatment facilities often overlook co-morbid psychological conditions by attributing symptoms to intoxication/withdrawal, or through inadequately assessing for other mental health problems. Overlooked and untreated co-morbid Axis I conditions render individuals extremely vulnerable to relapse post-treatment (Hasin, Liu, Nunes, McCloud, Samet, & Endicott, 2002; Kushner, Abrams, & Borchardt, 2000). Furthermore, treating an addiction without attending to characterological (Axis II) problems is rarely effective because the personality symptoms persist as major relapse vulnerabilities, and continue to interfere in interpersonal relationships, negatively impacting others who might otherwise be providing or supporting treatment (Ball,

2005). Researchers widely document the relationships between addictions and Axis I and II pathology, described in more detail below.

Alcohol: Alcohol misusers are 2-3 times more likely to have an anxiety disorder, more commonly report agoraphobia, social phobia, panic disorder, generalized anxiety, and have a higher risk for suicide (Stockwell 1995; Rassool 2006; 2009). The prevalence of major depression and AUDs is documented in treatment and non-treatment seeking individuals (Grant & Harford, 1995). Among national survey respondents who sought treatment for an alcohol use disorder, 41%, 33%, and 33% had at least one independent mood disorder, independent anxiety disorder, or drug use disorder, respectively (Grant, et al., 2006). Among treated individuals with an alcohol use disorder, 39% exhibited at least one personality disorder. Alcoholics exhibit significantly higher rates of antisocial and dependent personality disorders when compared to non-alcoholics (Rassool, 2009). Alcoholics with co-morbid diagnoses (especially personality disorders) have worse prognoses in treatment, utilize emergency services more frequently, and have more inpatient admissions (McCrone et al., 2000). It remains unclear if increased treatment-seeking among co-morbid individuals is due to severity of the substance use disorders, comorbid pathology, or other factors (Stinson et al., 2006).

Drugs: Substance abusing individuals tend to exhibit a number of psychological problems, including psychiatric, interpersonal, poor motivation to change, attachment difficulties, cognitive distortions, unstable identites, maladaptive beliefs, poor coping, or defensive mechanisms such as denial and projection (Ball, 2005). Substance users exhibit higher levels of borderline and antisocial personality conditions (Bon et al., 2004), and incidence of a Cluster B (antisocial, narcissistic, histrionic, borderline) personality disorder is higher among

non-alcohol abusing individuals (Skodol, Oldham, & Gallaher, 1999; Bon et al., 2004). Individuals with bipolar disorder have higher rates of SUDs, particularly those experiencing dysphoric mania (Khantzian, 2003; Albanese & Pies, 2004). Higher levels of depression, generalized anxiety, and panic have also been observed in opiate and sedative users (Conway, Comptom, Stinson, & Grant, 2006; Rounsaville et al., 1982). Drug users have higher rates of traumatic experiences (especially women) than non drug users, and childhood abuse has been found three times higher in opiate addicts from controls (Khantzian & Albanese, 2008; Heffernan, Cloitre, Tardiff, Marzuk, Portera, & Leon, 2000). SUDs most commonly occur in individuals with PTSD, affecting an estimated 50-85% of those with the disorder (Keane & Wolfe, 1990; Newton-Taylor, DeWit, & Gliksman, 1988). Studies have demonstrated that PTSD symptoms precede substance use, which is primarily utilized to control emotional distress, and then maintained by negative reinforcement from symptom relief (Stewart, 1996; Kessler, 2000).

In summary, comorbid Axis I and II disorders commonly occur with substance-use disorders, resulting in an extremely difficult and complex population to treat. Treatment approaches to addictions over the past 50 years have been dominated by biological and disease-based theories. Although important, the addiction-as-illness approach overemphasizes biological levels of explanation, overshadowing the psychological complexity of the substance-dependent individual and their internal states (Graham, Young, Lalach, & Wood, 2008). As such, often, an individual's emotional life (e.g. co-morbid psychological conditions) goes unaddressed in treatment settings, rendering him/her vulnerable to relapse post-treatment (Witkiewitz & Villarroel, 2009; McCarthy, Tomlinson, Anderson, Marlatt, & Brown, 2005; Kessler et al., 1997). Addictions result from the interactions of many factors, including biological/genetic

predispositions, psychological constitutions, social environments, and the nature of the activity itself (Griffiths, 1999). To comprehensively treat the individual and further prevent relapse, the approach toward -- and conceptualization of -- addictions must be flexible, accountable, integrative, and reflexive (Griffiths, 2005). Through co-morbidity research, we seem to know a great deal about the extent that other Axis-I and II conditions plague addicts; yet, understanding the dynamics of these complexities remains amiss. This is where psychodynamic theory can help—in enhancing conceptualization. To integrate psychodynamic theory, we must return to the basics, re-evaluating addiction from the ground-up, focusing on context, meaning, and understanding of the individual as a whole (Frohlich, Potvin, Chabot, & Corin, 2002; Griffiths, 2005). Psychoanalytically-informed theory can strongly help in conceptualizing underlying emotional life of the addict, perhaps providing insight into the emotional conflicts and functioning that underlie maladaptive behaviors and propel addiction. According to the psychoanalytic principle of multiple determination, all behavior is a product of multiple determinants—unconscious and conscious, as well as genetic, adaptational, structural, and dynamic (Greenspan, 1976). To adequately approach and treat addiction, gaining a more thorough understanding the *nature* of an addict's emotional difficulties is of the utmost importance. To do this, we can examine the utility of the psychodynamically-informed theory of Self-Medication for addictions (Khantzian, 1999, 2003). This theory, detailed below, examines the way in which particular substances function biologically, the emotional states they tend to ameliorate, and the psychological functioning of the individual that each substance tends to attract.

The Self-Medication Theory of Addiction

Complimenting biological understandings of the addictive process, one of the most intuitively compelling theories to explain the initiation, persistence, and successful remission from SUD is the Self-Medication theory of addictive disorders (Khantzian, 1985, 1997, 2003). The Self-Medication theory has been developed by medical professionals, who consider this theory as a modified psychodynamic model complemented by a modern psychiatric understanding of addictions—combining the *facts* and *experience* of SUDs (Khantzian & Albenese, 2008).

Edward J. Khantzian, M.D., is a psychiatrist trained psychoanalytically. The Self-Medication theory evolved out of extensive clinical work conducted by Khantzian in the 1970s and 1980s, strongly influenced by clinical observations and theoretical underpinnings of psychoanalytic theory. Khantzian's observations and theoretical conclusions were based on careful, in-depth evaluation and understanding of patients' states of psychological pain and suffering, characterological traits and defenses related to their suffering, and how the effects of a particular drug were experienced (Khantzian, 1999). In working with over 200 Opiate addicts in methadone treatment, Khantzian observed that patients' histories revealed lifelong difficulties with rage and violent behavior predating their addiction, often linked to exposure to extreme aggression and violence in their early family life and environment (Khantzian, 1972, 1978, 1985). Khantzian expanded his work to include cocaine addiction in the 1980s. After further observation and clinical work, he observed cocaine-addicted patients to share lifelong difficulties with impulsive behavior, emotional lability, acute and chronic dysphoria, and self-esteem

disturbances that preceded cocaine use (Khantzian, 1999). Concurrently, while working with alcoholics, Khantzian observed their unique tendency to present as highly defensive and use repression to inhibit and rigidly control uncomfortable emotions (Khantzian & Albanese, 2008). After extensive observation, study, and clinical work, Khantzian concluded that addicts suffer from major deficits in self-regulation (Khantzian, 2005).

According to E. J. Khantzian's (2003) Self-Medication theory, substance addiction functions as a compensatory means to modulate affects and self-soothe from distressful psychological states. Building on the work of contemporary psychoanalytic theory of Substance Use (e.g. Dodes, 1990, 1995, 2009), Khantzian conceptualizes drug use as a "self-regulation disorder", operating to relieve suffering and exercise omnipotent control over the (otherwise) experience of helplessness that arises from confusing and uncontrollable affects (Khantzian, 2005). Drug use becomes a "protective system", allowing individuals to more readily cope with internal emotions and external reality (Wurmser, 1980; Khantzian, 1999). To manage emotional pain, dysphoria, and anxiety, substance users use the drug *actions*, by their physiological and psychological effects, as an attempt to achieve emotional stability and restore internal equilibrium and potency (Suh, Ruffins, Robins, Albenese, & Khantzian, 2008; Dodes, 1990). In addition, the short-term ability of addictive substances to alter the distress associated with issues in regulating emotion, self-worth, relationships, helplessness, and behaviors powerfully reinforces dependence on the substance. Khantzian believes that (1) drugs act to relieve/control suffering, but there is also (2) a considerable degree of specificity in a person's choice of drugs, namely, that individuals navigate towards a certain drug *because of* its psychological and physiological effects (Khantzian & Albanese, 2008). Accordingly, Self-Medication theory states

that drug choice is strongly influenced by an individual's unique emotional life. The Self-Medication theory posits that several factors influence what drug appeals most to a person, including the chief effect or action of the drug, the personality of the individual, the inner states of their distress, and the availability of the substance (Khantzian & Albenese, 2008; Zinberg, 1984). Khantzian's theory and research focuses on three drug categories: CNS Depressants, Opiates/narcotics/analgesics, and CNS Stimulants. According to the theory, these three categories vary in the way that their respective substances regulate emotions, both physiologically and psychologically. Details on each category, and its appeal to particular individuals, are provided below.

The Process of Each High and Whom it Attracts

CNS Depressants: Central-Nervous System (CNS) Depressants (alcohol, barbiturates, and benzodiazepines) have anti-memory properties as well as relaxant and sedative-hypnotic effects (Parrott, Morinan, Moss, & Scholey, 2004). At low concentrations, due to inhibiting norepinephrine transmission and increasing dopamine and fluidity of cell membranes, alcohol can have excitant or 'disinhibitory' effects, reducing perceived anxiety, social inhibition and fostering feelings of closeness with others (Benton, 1988; Winger, Woods, & Hoffmann, 2004; Kushner, Abrams, & Borchardt, 2000; Watson & Little, 2002; Parrott et al., 2004). In this state, individuals are vulnerable to short-sighted or impulsive actions, known as 'alcohol myopia' (Parrott et al., 2004). Although initially producing euphoria, as concentrations increase, alcohol has overall depressant and sedative effects (Grant & Harford, 1995). Self-medication for depression with alcohol may be effective in the short-term, but chronic self-medication may lead

to increased dysphoria and exacerbation of depressive symptoms (Grant & Harford, 1995). Alcohol withdrawal is also associated with re-inducing norepinephrine systems in the brain, which may serve to generate anxiety, and create a vicious cycle by driving an individual to drink and 'self-medicate' the anxiogenic effects (Kushner et al., 2000). Barbiturates follow the same course, although in pill form, and are used less now than historically, due to them being supplanted by benzodiazepines (Winger et al., 2004). Benzodiazepines are commonly used by polydrug abusers, alcoholics, and recreationally for anxiety reduction (e.g. "downers"), to help counteract effects of withdrawal from stimulants, and for their hedonic effects (Winger et al., 2004; Ashton, 2002).

According to Self-Medication theory, alcohol abusers tend to inhibit and over-contain their experience of emotions, utilizing rigid defenses of repression and denial (Khantzian & Albanese, 2008; Suh, Ruffins, Robins, Albanese, & Khantzian, 2008). The "cutting off" and unacknowledgement of emotions leaves individuals feeling empty and isolated (Khantzian et al., 1990). As such, alcohol serves to soften this defensive structure and allows individuals to relieve tense emotional states (Khantzian, 1999).

Opiates/Analgesics/Narcotics: Opiates produce a high by reducing the normal release of neurotransmitters in the brain, generating slowing and analgesic effects. Initially, the ingestion of narcotics (e.g. heroin) gives an individual an extremely preoccupying rush of pleasure (Caan, 2002). Main effects of small doses include drowsiness, reduction in stimulus sensitivity, reduced anxiety and inhibition, relaxation of the body's muscles, pain relief, and slowed respiration (Parrott et al., 2004). The remaining reported effects of narcotics are feelings of safety, being 'wrapped in a cotton blanket', and feeling immune from life's pains, miseries, and humiliations

(Caan, 2002). Pharmacological studies suggest that the elation achieved by opiate ingestion occurs most often in persons who are depressed or anxious (Feldman, Meyer, & Quenzer, 1997). The gripping cycle of use with narcotics not only involves chasing feelings of warmth, numbness, and safety, but also occurs to avoid negative states induced by substance withdrawal.

Self-Medication theory proposes that a significant portion of narcotic addicts become addicted because they discover that the drug acts specifically to reverse regressive states by attenuating, and making more bearable, dysphoric feelings involving aggression, rage, and related depression—often associated to the experience of trauma (Khantzian, 1999; Khantzian & Albanese, 2008). Clinical observations stated that often, this kind of behavior in addicts appeared to be precipitated by major losses and disappointments, and the individuals lack the capacity to deal with intense affect (Khantzian, 1999). The association between narcotics and rage has been found in animal studies, where acute administration of narcotic drugs suppresses aggressions produced by many procedures and in several species. In biological studies, morphine has been shown to block aggression in after pain-induced shocks or in situations that do not involve pain (Lal et al., 1975, Emley et al., 1970). According to Self-Medication, it is likely that whenever there is oppression, developmental impairments, psychic turmoil, rage, and depression, there is correspondingly a ready-made market for narcotic drugs—which effectively mute action on these affects and re-organize the rage-regressed ego.

Stimuluants: When snorted or taken intravenously, cocaine and amphetamines lead to increased (monoamine) dopamine and noradrenaline activity, due to the drug blocking reuptake of neurotransmitters into synaptic terminals (Winger et al., 2004). This stimulation heightens

alertness, decreases sleep and appetite, increases locomotor activity, and intensifies mood states (Parrott et al., 2004; Winger et al., 2004). The initial effects of cocaine are reported as very positive, including increased energy and feeling powerful. Drug users report being more confident and lively, and experiencing the world as more interesting and pleasurable (Parrott et al., 2004). Accordingly, cocaine can be thought of as counteracting anhedonia in depressed individuals. The initial effects of cocaine mimic hypomanic activity, attracting those needing a 'boost' to stave-off dysphoria, or to maintain a manic state (Rassool, 2009). This initial euphoric effect of cocaine can never be recaptured, no matter how much of the substance is ingested (Caan, 2002). Regular periods of use (dopamine overactivity) can generate feelings of suspiciousness and paranoia, lead to increased violence, and individuals displaying antisocial and troublesome behavior patterns. In one study, men whose initial cocaine use progresses most rapidly to severe dependence were those who had the most problems in situations involving unpleasant emotions (Kasarabada, 1998).

The Self-Medication theory identifies two types of cocaine abusers: "low energy" and "high energy" individuals. Both types of users appear to be avoiding affect related to depression. "Low energy" cocaine abusers experience chronic feelings of boredom, dysphoria, or fatigue—mirroring a depressive state (Khantzian & Albanese, 2008). For these individuals, cocaine acts as a means to increase energy and counter anhedonia. Conversely, the "high energy" class of individuals possess a magnified need for elation and excitement (Khantzian, Halliday, & McAuliffe, 1990). "High energy" users can also be thought of using cocaine as a 'flight from depression', by living a restless lifestyle, and maintaining feelings of hypomania.

Previous Research on the Self-Medication Hypothesis

Previous empirical investigations of self-medication have established connections between substance use and higher levels of psychological distress, but with mixed results in establishing drug specificity in psychological functioning (Aharonovich, Nguyen, & Nunes, 2001; Castenda, Lifshutz, Galanter, & Franco, 1994; Schinka, Curtiss, & Mulloy, 1994; McCarthy et al., ; Henwood & Padgett, 2007). For example, using the Beck-Depression Inventory and State-Trait Anger Expression Inventory (Beck, Steer, & Brown 1996; Spielberger, 1996) Aharonovich et al. (2001) found higher levels of distress in addicted individuals, but research did not support Khantzian's theorized drug-specificity. These findings, however, are based on samples of N = 20 in each substance group. Similarly, other research (e.g. Craig, 1988; Greene et al., 1993) found higher rates of distress in substance users, but struggled to differentiate between substance groups. These studies used only the clinical scales of the MMPI-2 in their research, which are multidimensional and do not accurately assess the *underlying* psychological states theorized by Khantzian. Castenda and colleagues (1994) used the Hopkins Symptom Checklist-Revised when investigating Self-Medication, which also does not accurately capture the underlying affects and defensive functioning of the individual. More recent research (e.g. Henwood & Padgett, 2007; Suh et al., 2008) found support for Self-Medication theory in studies using relevant constructs to measure subjective, distressful emotions, rather than psychiatric diagnoses or incongruent assessment tools. For example, recent research utilized the Harris-Lingoes scales of the MMPI-2 versus the previously investigated clinical diagnostic scales (Butcher, Graham, Williams, & Ben-Porath, 1990). Using these scales, Suh et al. (2008) found evidence in support of the Self-Medication theory, finding alcoholics to have a greater

tendency to over-control their anger, use repression, and refrain from acknowledging their emotions; heroin users to experience higher levels of anger, trauma, and negativity; and cocaine users more apt to maintain restless and exhilarating psychological states.

Previous Personality Research Using the PAI, MMPI, and YSQ in Addiction

MMPI and Addiction/Drug of Choice: Studies using the MMPI to evaluate psychological functioning in various addictions have been mixed, with some finding differences in psychopathology by drug type (Miles, Svikis, Klustad, & Haug, 2001; Marlow, Pintard, Sutker, & Allain, 1988; Ingersoll et al., 1995; Gerra et al., 2008; Walfish, Massey, & Krone, 1990), but not all (e.g. Donovan et al., 1998). In general, individuals reporting their motive to use drugs to "self-medicate" produced MMPI profiles characterized by marked neurotic symptoms, including high levels of anxiety, anger, somatisizing, and exaggerated antisocial and non-conforming tendencies (Marlow et al., 1988). With that said, researchers interpreted addicts to have a lack of development of adult coping strategies, immature and impulsive characterological features, and chronic disappointment with life circumstances. When assessing by drug type, studies evaluating the MMPI-2 profiles of alcohol- *and* drug-dependent women found profiles to be dominated by psychopathic deviate (Pd), schizophrenia (low ego-strength; Sz), and depression (D) scale elevations, indicating these individuals had impulsive, chaotic, disorganized, and unusual behavior and thought patterns, felt alienated, were at a higher risk for suicide, and had difficulties in sustaining long-term relationships (Miles et al., 2001; Ingersoll et al., 1995). Research has also found elevations on the psychopathic deviate (Pd) and Mania (Ma) clinical scales when evaluating personalities of cocaine addicts, (Walfish et al., 1990). Recently, when

comparing cocaine and heroin users, researchers found that heroin addicts displayed higher levels of hysteria (Hy), masculine-feminine (Mf), and Social Introversion (Si), compared to the higher levels of hypochondria (Hs), psychopathic deviance (Pd), and Paranoia (Pa) exhibited among cocaine addicts (Gerra et al., 2008). In the past, some research has attempted to identify depression in alcoholics by MMPI scores, but without success (Elwood, 1993). This is likely a function of alcoholics' primary defenses of repression and denial, as previously noted. Although these investigations noted the serious psychological disturbances among substance users, patterns in MMPI profiles by substance remain in question.

Recent research evaluating Self-Medication theory has suggested that the clinical scales of the MMPI are heterogeneous and multidimensional in content, and thus insufficient in targeting unique affected-related constructs in individuals' psychological functioning (Suh et al., 2008). The trends of paranoid and antisocial functioning in addicts found throughout the MMPI and other personality measures could also imply difficulties more on a characterological level. As such, this investigation will employ methods used by Suh et al. (2008) when evaluating the MMPIs of individuals, focusing on the Harris-Lingoes (1955) subscales, content scales, and supplementary scales of the MMPI-2. The Harris-Lingoes offer dimensionally homogeneous subscales based on each of the clinical scales, providing clinical descriptions and *underlying factors* of the syndromes assessed by the standard clinical scales (Graham, 2002; Ward, 1997; Suh et al., 2008). Results from Suh et al.'s investigation partially confirmed Khantzian's theory, and demonstrated a relationship between psychological characteristics and drug of choice. Adjustments have been made in this study as suggested, such as substituting the Harris-Lingoes

Dep-1 scale to target lack of drive/anhedonia in cocaine addicts, rather than assessing overall depression.

Personality Assessment Inventory: A few studies have been conducted assessing PAI (Morey, 1991) profiles of alcoholics and addicts, and to attempt to differentiate personality profiles on the basis of drug-of-choice. When assessing factor structure of the PAI in alcohol-dependent patients, Schinka (1995) found a separate factor to exist for alcoholics over clinical samples, postulating that this reflected an interpersonal style characterized by higher levels of psychological dysfunction (low levels of warmth, high levels of paranoia, and higher levels of schizophrenia). Despite this difference, no further research has explored this connection. Hopwood and colleagues (2008) found that when comparing profiles of heroin and crack users, the heroin users had a tendency to externalize and produce PAI profiles with higher levels of antisocial tendencies, whereas crack users presented with more internalizing problems characterized by increased depression, anxiety, and paranoia (Hopwood, Baker, & Morey, 2008). The PAI has also predicted the course of treatment for some substance misusers. Applying the PAI to treatment process in a separate paper, Hopwood et al. (2008a) found the aggression scale, antisocial behaviors and treatment process index of participants in treatment to predict history of assault, rule infarctions during treatment, and treatment completion (Hopwood, Baker, & Morey, 2008a). To date, there has not been data examining the PAIs of substance users on the basis of drug-of-choice focusing on psychological functioning. Prior studies have primarily focused on the validity of the drug (DRG) and alcohol (ALC) scales in the PAI. The use of the PAI in this project will help evaluate the extent to which drug and alcohol users to exhibit paranoid,

antisocial, and aggressive tendencies. In the current study, it is expected that these tendencies will differ as a function of drug type.

Early Maladaptive Schemas: Early Maladaptive Schemas are broad, pervasive themes or patterns, comprised of memories, emotions, cognitions, and bodily sensations, regarding oneself and one's relationships with others that are dysfunctional to a significant degree (Young, Klosko, & Weishaar, 2003). These schemas are shaped during childhood, elaborated upon through life experiences and interpersonal interactions, and function to organize one's perceptions of the world (Festinger, 1957; Harris & Cutin, 2002; Wellburn, Coristine, Dagg, Pontefract, & Jordan, 2002; Wellburn, Dagg, Coristine, & Pontefract, 2000). Early Maladaptive Schemas (EMS) evolve from unmet emotional needs and dysfunctional relationships in childhood (Young et al., 2003). EMS represent a core cognitive vulnerability to depression, anxiety and personality disorders, which, when activated, lead to issues that render individuals vulnerable to further emotional turmoil (Calvete, Estevez, Lopez de Arroyabe, & Ruiz, 2005; Glaser, Campbell, Calhoun, Bates, & Petrocelli, 2002; Harris & Cutin, 2002; Lumley & Harkness, 2007; Petrocelli, Glaser, Calhoun, & Campbell, 2001; Schmidt, Joiner, Young, & Telch, 1995; Welburn et al., 2002). Many schemas formed in childhood are adaptive and positive, although others can be formed in response to negative or chaotic environments, and become increasingly rigid and irrational as individuals age. Interwoven into personality, Early Maladaptive Schemas have been found connected to substance-use disorders (Ball & Cecero, 2001; Ball & Young, 2000). Research has connected the schema of Mistrust/Abuse to multiple personality dimensions (Ball, 2005). When separating personality disorders, antisocial personality disorder was related to schemas of Emotional Inhibition and Vulnerability to Harm, Borderline personality disorder to

schemas of Abandonment, and Histrionic individuals to Social Isolation, Dependence/Incompetence, and Unrelenting Standards (Ball, 2005). When evaluating schemas as a function of substance use, researchers have found Insufficient Self-Control, Mistrust/Abuse, and Abandonment in alcoholics (Decouvelaere et al., 2002); Emotional Inhibition, Subjugation, and Vulnerability to Harm schemas in a second set of alcohol abusers (Brotchie et al., 2004); and Social Isolation, Self-Sacrifice, and Unrelenting Standards to be elevated in homeless substance users (Ball, Cobb-Richardson, Connolly, Bujosa, & O'Neall, 2005). It is clear that more research needs to be conducted to strengthen the literature in this area, particularly in light of the well-established connections between both early maladaptive schemas and drug use to personality disorders. Within Young's schema model, two particular early maladaptive schemas exist that are relevant to Khantzian's theory: Emotional Inhibition (EI) and Insufficient Self-Control (ISC). Evaluating these two schemas in the context of Self-Medication could provide insight into the repressive and avoidant tendencies of alcoholics (Emotional Inhibition), and the inability of drug users to regulate their emotions and/or behavior (Insufficient Self-Control). Research investigating the Self-Medication theory with early maladaptive schemas has yet to be done. This could serve as additive to the literature, and using schemas in this project adds another layer and perspective to the personality functioning of addicts and alcoholics, particularly in reference to poorly developed defenses/coping skills.

Summary and Hypotheses

In summary, Khantzian's Self-Medication Hypothesis has two main components: 1) addictive drugs become addicting because they have the power to alleviate, remove, or change (and in turn control) human psychological suffering, and 2) there is a considerable degree of specificity in a person's drug of choice, and individuals navigate towards a certain drug because of its psychological and physiological effects (Khantzian & Albanese, 2008). Pertaining to drug specificity, Khantzian proposes three categories of drugs that individuals gravitate to: CNS depressants (e.g. alcohol, benzodiazepines, barbiturates), CNS stimulants (e.g. amphetamines, cocaine), and Narcotics (e.g. opiates, analgesics). Khantzian posits that CNS depressant users tend to over-contain and inhibit their experience of emotions, through repression and denial, which causes feelings of loneliness and isolation. Depressants soften this defensive structure and allow for tension and stress reduction in users (Khantzian et al., 1990; Khantzian & Albanese, 2008; Suh et al., 2008). CNS stimulant users, both "high" and "low" energy individuals, experience chronic feelings of boredom, dysphoria, and fatigue. Stimulants serve to avoid their depression by countering anhedonia, providing a rush of energy, and/or maintaining feelings of hypomania (Khantzian et al., 1990; Khantzian & Albanese, 2008). For narcotic addicts, the drugs act to reverse feelings involving aggression, rage, and related depression often associated with trauma. Narcotic addicts are believed to lack the defensive or adaptive coping mechanisms to handle intense affect (ego strength). Narcotics act to mute action on the intense emotion and re-organize the regressed ego (Khantzian, 1999).

As previously stated, research supporting the Self-Medication theory has had limited success. I postulate, along with Suh et al. (2008), that this could be a consequence of using assessment measures that do not capture the underlying affective functioning of the addict and small sample sizes. With limited research conducted, and inconsistencies in measuring the underlying psychological and defensive functioning of the addict, more research needs to be conducted in light of these findings. The Self-Medication theory has only been tested once with the Personality Assessment Inventory, which was too broad when used alone (Schinka et al., 1994), and has yet to be tested with the Young Schema Questionnaire, both which function to assess characterological problems and modes of affect-regulation unique to the individual. Often, researchers have not had the ability to assess alcoholics and various addicts concurrently. Also, recent research supporting the Self-Medication theory (Suh et al., 2008) using the special subscales of the MMPI-2 has yet to be replicated. The assessments used in this study more accurately pertain to the theory, and could provide insight into its validity, or perhaps into areas that need re-evaluating to better distinguish between addictive groups.

If psychological attributes and patterns in personality functioning exist that distinguish depressant, stimulant, and opiate addicts from each other, and if we can detect these patterns, we then have usable scaffolding upon which we can add to models of acquisition of addiction, its maintenance, and treatment. Analyzing psychological, personality, and maladaptive schema data concomitantly might further this process. Due to the comprehensive nature of the assessment process at Cornerstone of Recovery, a prominent treatment center for alcoholism and addictions based in Louisville, TN, I have been given the opportunity to simultaneously assess how the *emotional* and *characterological* functioning of alcohol-and substance-dependent individuals

impact their drug of choice. As such, the hypotheses of this study have been broken down into three substance categories derived from Khantzian's (1997, 2003) work.

The A priori Hypotheses:

In an attempt to replicate and expand upon recent research, I intend to investigate whether personality, emotional regulation, and defenses differ as a function of drug choice, as proposed in the Self-Medication theory. I will investigate this possibility through using subscales of the MMPI-2, PAI, and YSQ. A chart of the 12 variables described below, their descriptions, and relevance to the theory is provided in Appendix A. From the MMPI-2, I will use the following variables from the supplementary, content, and Harris-Lingoes subscales: Subjective Depression (Dep-1), Cynicism (CYN), Psychomotor Acceleration (Ma2), Post-Traumatic Stress (Pk), Repression (R), Ego Strength (Es), and Over-controlled Hostility (O-H). To assess for characterological functioning, I will use the Paranoid (PAR), Antisocial (ANT), and Aggressive (AGG) variables of the PAI. From the YSQ, I will use the Early Maladaptive Schemas of Emotional Inhibition (EI) and Insufficient Self-Control (ISC). These variables are hypothesized to differ by drug-of-choice group. I will compare stimulant, depressant, and narcotic addicts against each other on the above variables, using Hotelling's T, which assesses for a multivariate test of differences between the variable mean values of two groups (Hotelling, 1931). Specific hypotheses are as follows:

CNS depressants (alcohol, barbiturates, and benzodiazepines)

H1: It is hypothesized that compared to the other groups, CNS depressant addicts utilize defenses of repression, over-control their anger, and inhibit their emotions to avoid

acknowledging their depression. Accordingly, I expect the following differences between Depressant addicts when compared to Other addicts:

Depressant addicts higher on:

1. Repression (R; MMPI-2)
2. Over-controlled Hostility (O-H; MMPI-2)
3. Emotional Inhibition (EI; YSQ)

Depressant addicts lower on:

1. Subjective Depression (Dep-1; MMPI-2)
2. Paranoia (PAR; PAI)
3. Aggression (AGG; PAI)

Opiate (narcotics, analgesics)

H2: It is hypothesized that compared to the other groups, Opiate addicts exhibit aggression, hostility, depression, and trauma, more difficulties in ego functioning to regulate affect, and display externalizing/antisocial behavior connected to their use. Therefore, I anticipate individuals identifying their drug of choice as an Opiate to reflect this style of emotional functioning by differing from Other addicts in the following ways:

Opiate addicts higher on:

1. Post-Traumatic Stress (Pk; MMPI-2)

2. Subjective Depression (Dep-1; MMPI-2)
3. Cynicism (CYN; MMPI-2)
4. Aggression (AGG; PAI)
5. Antisocial Tendencies (ANT; PAI)
6. Insufficient Self-Control (ISC; YSQ)

Opiate addicts lower on:

7. Ego Strength (ES; MMPI-2)

CNS stimulants (cocaine and amphetamines)

H3: It is hypothesized that compared to the other groups, CNS stimulant addicts experience anhedonia, have a propensity to mania, paranoia and aggression, and experience difficulty in regulating their emotions. Therefore, individuals identifying their drug-of-choice as a CNS stimulant will reflect this style of emotional functioning by differing from Other addicts in the following ways:

Stimulant addicts higher on:

1. Psychomotor Acceleration (Ma2; MMPI-2)
2. Subjective Depression (Dep-1; MMPI-2)
3. Cynicism (CYN; MMPI-2)

4. Paranoia (PAR; PAI)

5. Insufficient Self-Control (ISC; YSQ)

For analysis, I will conduct three Hotelling's T tests (essentially three MANOVAs) to assess whether each group differs from the other two groups on the variables predicted (i.e., . CNS depressants group vs. combined opiates/stimulants groups; Opiates group vs combined depressants/stimulants groups; and stimulants group vs. combined depressants/opiates groups). Each Hotelling's T is tied to one of the three hypotheses discussed above. Hotelling's T has been chosen as the primary analysis because it most concisely and powerfully tests theory-driven notion that each addict group differs from the other two groups across specific personality variables. If a Hotelling's T is statistically significant at .05 or less, I will conduct Univariate analysis to determine whether the directionality of each variable is as predicted, and to clarify what variables might be "driving" the relationships between personality and drug-of-choice. Finally, there will be an exploratory post-hoc analysis outside the contours of theory such that I conduct a discriminant function analysis seeking to predict group membership across all personality variables. These steps are summarized below:

Testing the 3 Hypotheses:

1. H1: MANOVA: Depressant addicts v. "Other" addicts (combined Opiate/Stimulant group) to test the relevance of variables to distinguish between groups.

    a. Follow-up Univariate ANOVAs to assess differences, and discern the extent to which differences are in the predicted direction.

2. H2: MANOVA: Opiate addicts v. “Other” addicts (combined Depressant/Stimulant group) to test the relevance of variables to distinguish between groups.
    a. Follow-up Univariate ANOVAs to assess differences on specific variables, and discern the extent to which differences are in the predicted direction.
3. H3: MANOVA: Stimulant addicts v. “Other” addicts (combined Opiate/Depressant group) to test the relevance of variables to distinguish between groups.
    a. Follow-up Univariate ANOVAs to assess specific variable differences, and discern the extent to which differences are in the predicted direction.

Exploratory Analysis:

1. Use a MANOVA across all personality variables to assess for overall significant difference between groups.
2. Extract significant Univariate ANOVAs from Step 1
3. Conduct a Discriminant Function Analysis to assess the groupings of variables that best predict drug-of-choice group membership.

Methods

After Institutional Review Board approval, I gathered data from Cornerstone of Recovery, a prominent treatment facility for addictions and alcoholism located in Louisville, TN. Upon admission to treatment, patients engage in numerous semi-structured interviews with staff and medical professionals, and complete a battery of assessment measures (described below) while in Assessment & Observation (A/O). Individuals stay in the A/O unit anywhere from 2-10 days, depending on their detoxification needs. Per treatment protocol at Cornerstone of Recovery, individuals experiencing withdrawal symptoms are identified upon treatment entry and adequately medicated/detoxified prior to completing assessment measures. Upon admission, individuals are assessed for opiate or alcohol withdrawal using the Clinical Opiate Withdrawal Scale (COWS; Wesson & Ling, 2003) and Clinical Institute Withdrawal Assessment of Alcohol Scale (CIWA-Ar; Sullivan, Sykora, Schneiderman, Naranjo, & Sellers, 1989). Post-detoxification, individuals are re-assessed, and once it is determined that he/she is no longer experiencing acute withdrawal and oriented to person/place/situation, assessments are then completed. Post-detoxification, individuals enter into one of the following treatment programs: inpatient adult, intensive outpatient, young adult residential, residential relapse and recovery inpatient, and combined outpatient/structured-living facility. Treatment stays range from 28-90+ days.

Assessment Measures Used:

Minnesota Multiphasic Personality Inventory-2nd Edition (MMPI-2; Hathaway & McKinley, 1989): a 567-item self-administered questionnaire in true/false format that assesses

the existence of various forms of Axis-I psychopathology. The MMPI-2 is frequently used to assess psychopathology in clinical and research settings because of its high reliability and validity (Butcher et al., 1989; Butcher & Williams, 2000; Graham, 1988; Greene, 1991). The standard clinical scales of the MMPI-2 have been shown to accurately identify diagnoses, but are insufficient in assessing unique, affect-related constructs due to their heterogeneous and multidimensional contents (Suh et al., 2008). Therefore, in this investigation, subscales from the supplementary, content, and Harris-Lingoes scales of the MMPI-2 were used (Butcher, Graham, Williams, & Ben-Porath, 1990; Graham, 2002; Butcher & Williams, 2000; Greene, 2000). These scales are more relevant in terms of the Self-Medication Hypothesis as they have been designed and proven to assess more meaningful psychological constructs, characteristics, clinical descriptions, and underlying factors of syndromes assessed by the standards clinical scales of the MMPI-2. Additionally, the subscales used in this investigation have all shown high reliability and validity, internal consistency, and construct validity (Graham, 2000, 2002; Lilienfeld, 1999; Spiro, 2000; Ben-Porath, McCully, & Graham, 2000). Details of studies pertaining to reliability and validity of the MMPI-2 are provided in Appendix A.

Personality Assessment Inventory (PAI; Morey, 1991): a 344-item self-report measure of personality in which examinees select the response that best pertains to them, endorsing a statement as not at all true, slightly true, mainly true, or very true. Test-retest reliability of the PAI demonstrated that the instrument taps relatively enduring patient characteristics rather than current clinical state alone (Morey, 1991; Parker et al., 1999). The PAI consists of 22 scales that provide a comprehensive overview of psychopathology in adults, and been shown to be a reliable measure in psychopathology (Morey 1991, 1996; Hopwood et al., 2008), with adequate

convergent and discriminant validity in its addiction subscales when compared to other measures of addiction (Parker et al., 1999). Details of studies pertaining to reliability and validity of the PAI are provided in Appendix A.

Young Schema Questionnaire—3rd Edition, Long Form (YSQ-L3: Young, 2005): a 232-item self-administered questionnaire that assesses for the presence of Early Maladaptive Schemas. The items are answered on a 6-point scale, with higher item scores (ranging from 1-6) reflecting a more unhealthy level of a particular maladaptive schema. The YSQ-L3 measures 18 cognitive schemas across 5 separate domains. Evidence supports the reliability and validity of this measure (Schmidt, Joiner, Young, & Telch, 1995; Lee, Taylor, & Dunn, 1999; Waller, Meyer, & Ohanian, 2001; Oei & Barnoff, 2007). Details of studies pertaining to reliability and validity of the YSQ are provided in Appendix A.

Substance Abuse Subtle Screening Inventory—3 (SASSI-3; Miller, 1999): a 94-item true/false questionnaire assessing for the possibility of a substance use disorder in individuals. The SASSI has two sides, with questions on the first side producing eight empirically derived scales that discriminate between known groups of substance abusers and persons who do not have a substance use problem. The second side assesses for a client's willingness to admit alcohol or drug abuse problems (Lazowski, Miller, Boye, & Miller, 1998). Both sides are taken into account when assessing for abuse/dependence problems. The SASSI has a DSM-IV substance dependence diagnostic criterion correspondence rate of 94%, has excellent test-retest reliability, and is considered a valid and reliable measure of detecting substance dependence in

respondents in multiple settings (Lazowski et al., 1998). Details of studies pertaining to reliability and validity of the SASSI-3 are provided in Appendix A.

Addiction Severity Index, 5th Ed. (ASI; McLellan et al. 1992): A well known and widely used structured interview designed to assess the severity of drug and alcohol use by analyzing addiction-related impairment in seven areas of functioning: Medical, Psychological, Family/Social, Legal, Employment, Alcohol, and Drug. The reliability and validity of this measure in treated substance abusers have been well documented (Argeriou, McCarty, Mulvey, & Daley, 1994; McLellan et al., 1992; Appleby, 1997; Carise et al., 2001). Details of studies pertaining to reliability and validity of the ASI are provided in Appendix A.

Drug Screen Information: All individuals entering treatment at Cornerstone partake in routine urination drug screens. Initial drug screen data have been used for the project, indicating which substances an individual was found positive for prior to entering treatment. This information was used to corroborate self-report and doctor-reported information when raters assessed and discriminated drug-of-choice in patients.

History and Physical conducted by Medical Staff: Upon admission at Cornerstone, a medical professional sees each individual for a physical exam and an interview assessing for current use, amounts of drug(s) used, self-reported drug-of-choice, drug use history, previous treatments, chronic/acute pain levels, current and outstanding medical issues, current medications, occupational status, current living situation, family history of alcohol/drug/psychiatric illness, and current levels of depression, anxiety, and suicidal ideation.

Alongside other information, history and physical reports were reviewed by raters when evaluating patients' drug-of-choice.

Procedure

Working with Medical Records staff at Cornerstone, we (L.C. and one undergraduate research assistant, L.A.) gathered information on patients entering treatment from 8/31/2007-2/15/2009. I constructed a database in SPSS 18.0 containing information from each patient's assessment and treatment, including demographic data, self-report assessments (described above), medical history, current drug screens, and treatment program attended. The information collected came from patients' medical records and assessments recorded via computer systems at the treatment facility. We included patients from different treatment programs, and also those that did not finish treatment, relapsed, or left Against Medical Advise (AMA). I excluded patients with incomplete or invalid assessments on the MMPI-2 ($L > 70$, $F > 99$, or $K > 80$) and PAI ($NIM > 93$ or $INF > 82$) from analysis, reducing the subject pool from an initial $N = 450$ to $N = 330$.

Determining Drug-of-Choice*:* Of the utmost importance to this study was accurately delineating each individual's drug-of-choice. In order to accurately and reliably determine each patient's drug-of-choice to our best extent, information pertaining to drug/alcohol use was separated and independently analyzed by two raters (L.C. and L.A.). We both followed the same algorithm in drawing conclusions: deriving each patient's drug-of-choice through examining their self-reported drug-of-choice, medical history taken by a doctor upon intake, diagnosis given by treatment team (headed by clinical director Scott Anderson, Ph.D., and medical directors

Curtis Markham, M.D. or Riley Senter, M.D.), initial paperwork, drug screen, amounts of drug(s) used, and information from the SASSI, PAI, and ASI drug/alcohol variables. Using this algorithm, individuals were then categorized into one of five drug-of-choice groups: 1) Depressant (alcohol, benzodiazepines, barbiturates), 2) Opiate (narcotics, analgesics), 3) Stimulant (crack, cocaine, amphetamines), 4) Marijuana, & 5) Indeterminate. I created the "Indeterminate" (5) category because I wanted to classify individuals into a drug-category only when we were *extremely confident* of the classification. At times, individuals had such extreme and complex drug use that it was impossible to determine drug preference. Any instance where a rater felt it impossible to confidently determine a drug-of-choice category, that individual was automatically classified as "Indeterminate". In all, this represented 3.3% of the sample. Details of these cases are provided in Appendix E. For analysis, only the Depressant, Opiate, and Stimulant groups (#1-3) were used, due to their relevance to the Self-Medication theory. An interrater reliability analysis using Cohen's Kappa and standards outlined by Shrout & Fleiss (1979) was performed to determine consistency among raters prior to analyzing data. A detailed description of this algorithm is provided in Appendix C.

Results

Patient Demographics: The sample consisted of 232 males (69.9%) and 100 females (29.9%). Age ranged from 17-71 years old (M = 37.7, SD = 12.34). Ethnic distribution consisted of 301 Caucasians (90.1%), 11 African-Americans (3.3%), 5 American-Indian/Alaskan Natives (1.5%), 3 who identified themselves as "Other" (0.6%), and 13 individuals who chose not to answer (3.9%). Distribution of relationship status was 120 married (35.9%), 108 single (32.3%), 58 divorced (17.4%), 24 separated (7.2%), 5 widowed (1.5%), 4 engaged (1.2%), and 1 partnered (0.3%). Occupationally, 177 individuals identified themselves as employed (53%), 91 unemployed (27.2%), 29 currently on a 'leave of absence' (8.7%), 9 working part-time (2.7%), and 3 as retired (1.0%).

Treatment Demographics: Of the various levels of treatment offered at Cornerstone of Recovery, 143 individuals entered into the Adult Residential Program (ARP; 42.8%), 37 into the Young Adult Residential Program (YA; 11.1%), 57 into the Residential Relapse and Recovery Program (17.1%), 34 into the Intensive Outpatient with Structured Living Provided Program (IOP/SLF; 10.2%), and 56 into Intensive Outpatient only (16.8%). Pertaining to treatment history, 165 individuals stated it was their first time in treatment (49.4%), 131 had prior treatment for substance abuse (39.0%), and 40 (12%) did not answer. In response to the question "what is the longest period of time you maintained sobriety?", 105 individuals reported less than 1 month (31.0%), 39 as 1-3 months (11.7%), 32 as 4-6 months (9.6%), 40 as 6 months-1year (12.0%); 42 as 1-3 years (12.6%), and 32 as five years or more (9.6%). Total time spent in treatment ranged from 1-381 days (M = 59.6; SD = 49.8). Of the individuals who entered

treatment, 235 completed their stay (70.4%), 48 left Against Medical Advice (14.4%), 43 were "Administratively Discharged" for rule violations (12.9%), and 6 were "Therapeutically Discharged" to a higher level of medical or psychiatric care (1.8%).

Assessing Drug-of-Choice: An algorithm developed by the primary investigator was used to delineate each patient's drug of choice, taking into account their current use, diagnoses at the end of treatment, report to the Medical Doctor, drug screens, levels of use, and clinical variables from assessment measures. Individuals were then categorized into one of five conditions (Depressant, Opiate, Stimulant, Marijuana, and Indeterminate). Two raters were each given 70 randomly selected (SPSS 18.0) cases to test inter-rater reliability based on the algorithm (Appendix C). Reliability was then calculated using Cohen's Kappa, which takes into account the agreement possibly occurring by chance (Fleiss & Cohen, 1973; Shrout & Fleiss, 1979). The Cohen's Kappa for rater agreement was 0.91, $p < .001$, which is considered "very good agreement" (Altman, 1991). A reliability count table, along with details of the cases "missed" between raters is provided in Table 1A. Bivariate correlations of predictor variables are provided in Table 1B.

Of the 330 cases assessed, 174 individuals were identified as preferring "Depressants" (52.1%), 96 as preferring "Opiates" (28.7%), 34 as preferring "Stimulants" (10.2%), 15 as "Marijuana" (4.5%), and 11 as "Indeterminate" (3.3%). Details of the cases categorized as "Indeterminate" are provided in Appendix E. I analyzed only the first three group conditions, reducing the sample from N = 330 to N = 304. A chart representing this categorization process is provided in Figure 1.

Gender Differences: According to independent samples t-tests (Table 2) with a Bonferroni correction of $p < .004$, females exhibited significantly higher levels of Subjective Depression than males [Dep-1: Female (F) Mean = 67.98 (SD = 15.16); Male (M) Mean = 61.24 (SD = 14.36)]. This is consistent with previous research that females have higher rates of depression than males (Kessler et al., 2003; Nolen-Hoeksema & Hilt, 2009). Chi square analysis indicated that gender did not significantly differ between drug-of-choice groups (chi square = 0.73, df = 2, $p = .69$)

Testing the Three Hypotheses Derived from Self-Medication Theory

Hypothesis I: Predicted Differences Pertaining to how Depressant Addicts Differ from the Other Two Groups

As per the theory of Self-Medication, I hypothesized that individuals addicted to a depressant (alcohol, benzodiazepine, or barbiturate) are emotionally over-controlled and inhibitive. As such, I anticipated depressant addicts to reflect this style of emotional functioning in higher levels of Repression (R; MMPI-2), Over-controlled Hostility (O-H; MMPI-2), and Emotional Inhibition (EI; YSQ), whilst reporting lower levels of Anhedonia (Dep-1; MMPI-2), Paranoia (PAR; PAI), and Aggression (AGG; PAI) when compared to other drug groups. To test this hypothesis, I utilized Multivariate Analysis. After assessing for Drug-of-Choice, those identified as Depressant addicts were coded as "1", and Opiate or Stimulant addicts as "0". In the model, I included all predictor variables previously discussed. With this analysis being multivariate, effect sizes are reported as partial η^2, or partial eta squared. Effect sizes of partial η^2, according to Cohen (1988), fall within the following parameters: 0.0099 = small effect (analogous to 0.2), 0.0588 = medium effect (0.5), and 0.1379 = large effect (0.8).

Because this hypothesis specifies 6 comparisons, I first tested the omnibus model using a MANOVA comparing depressant addicts to other addicts across all the proposed indices, taken together. The overall model was statistically significant, indicating that across the six measures taken together, Depressant addicts and Other addicts respond differently: $F(6, 266) = 5.27$, $p < .001$; Hotelling's Trace = .12, partial $\eta^2 = .11$. In order to evaluate what differences exist, and

whether the differences were in the direction predicted, I examined the Univariate ANOVAs of predictor variables for significance.

Table 3 summarizes the six Univariate differences on the criterion variable, specifying differences, and their directionality. As per Table 3, four of the six Univariate comparisons were statistically significant, and all group differences were in the hypothesized direction. Specifically, the Depressant group significantly differed from Other addicts in their levels of Paranoia, $F (1, 266) = 16.34$, $p < .001$, partial $\eta^2 = .06$; Subjective Depression, $F (1, 266) = 12.43$, $p < .001$, partial $\eta^2 = .04$; Over-controlled Hostility $F (1, 266) = 8.17$, $p = .005$; partial $\eta^2 = .03$, and Aggression, $F (1, 266) = 4.29$, $p = .039$, partial $\eta^2 = .02$. No significant differences were observed in levels of Repression or Emotional Inhibition.

Hypothesis 2: Predicted Differences Pertaining to how Opiate Addicts Differ from the Other Two Groups

As per the theory of Self-Medication, I hypothesized that individuals identified as addicted to an Opiate (narcotic or analgesic) struggle to regulate intense affect, are more aggressive/hostile than other addicts, experience depression and trauma, and display antisocial behavior connected to their use. As such, I anticipated Opiate addicts to reflect this style of emotional functioning by having higher levels of reported Post-Traumatic Stress (Pk; MMPI-2), Anhedonia (Dep-1; MMPI-2), Cynicism (CYN; MMPI-2), Antisocial Tendencies (ANT; PAI), Aggression (AGG; PAI) and Insufficient-Self Control (ISC; YSQ) than other addicts, whilst having lower levels of Ego Strength (ES; MMPI-2). To test this hypothesis, I used a second

Multivariate Analysis, coding individuals identified as Opiate addicts as "1", and Depressant/Stimulant addicts as "0".

The second multivariate analysis indicated the overall model as significant, meaning that across the seven measures combined, Opiate addicts and Other addicts respond differently, $F(7, 263) = 5.29$, $p < .001$, Hotelling's Trace = .14, partial $\eta^2 = .12$. Table 4 summarizes the seven Univariate analyses, indicating significance and directionality. As per Table 4, five of the seven Univariate comparisons were statistically significant, and all group differences occurred in the hypothesized direction. Specifically, Opiate addicts differed on their levels of Post-Traumatic Stress, $F(1, 263) = 6.91$, $p = .01$, partial $\eta^2 = .03$; Subjective Depression, $F(1, 263) = 7.68$, $p = .006$, partial $\eta^2 = .03$; Cynicism, $F(1, 263) = 12.66$ $p < .001$, partial $\eta^2 = .05$; Ego Strength, $F(1, 263) = 4.38$, $p = .04$, partial $\eta^2 = .02$; and Antisocial Tendencies, $F(1, 263) = 22.56$, $p < .001$, partial $\eta^2 = .08$. No significant differences were observed for the Opiate group on levels of Insufficient Self-Control or Aggression.

Hypothesis 3: Predicted Differences Pertaining to how Stimulant Addicts Differ from the Other Two Groups

The third hypothesis pertained to Stimulant addicts. As per Self-Medication theory, I hypothesized that when compared to other groups, Stimulant addicts experience anhedonia, have a propensity to mania, paranoia, and aggression, and have difficulty in regulating their emotions. I anticipated these differences to be reflected through higher levels of Hypomania (Ma2; MMPI-2), Subjective Depression (Dep-1; MMPI-2); Cynicism (CYN; MMPI-2), Paranoia (PAR; PAI),

and Insufficient-Self Control (ISC; YSQ). For the third multivariate analysis, I coded individuals identified as addicted to a Stimulant as "1" and Opiate/Depressant addicts as "0".

The third multivariate analysis indicated that across the combined five measures, Stimulant addicts do not respond differently than Other addicts, $F(5, 265) = 0.50$, $p = .77$, Hotelling's Trace = .01, partial $\eta^2 = .01$. Details of each Univariate analysis are provided in Table 5. In analyzing group means it appears that Stimulant addicts have slightly higher levels of Subjective Depression and Insufficient Self-Control than other groups, although this difference is non-significant. It is likely that results of the analysis attempting to differentiate stimulant addicts from others are hampered by the small sample size in this category relative to the other groups (N = 28).

Exploratory Post-Hoc Analysis

I conducted an exploratory post-hoc analysis outside the contours of Self-Medication theory using Discriminant Analysis to assess for the potential collective influence of other personality variables on differentiating between Drug-of-Choice groups. At my disposal were 16 subscales of the PAI, 28 Harris-Lingoes subscales of the MMPI-2, and 9 Content/Supplemental subscales of the MMPI-2. With a very large amount of potential predictor variables (53), I first had to narrow down which to use. It is suggested that in statistical research, reducing the number of variables to a manageable size is sometimes warranted, and done by discarding variables that do not provide predictive validity (Huberty, 1989; Whitaker, 1997). As such, I chose to conduct the exploratory analysis in three steps: Step 1: to place all 53 predictor variables into a MANOVA to confirm that drug-of-choice significantly differs across the combined 53

variables, Step 2: if the overall model is significant, to analyze the Univariate ANOVAs detailing which of the 53 variables significantly differ between groups, and Step 3: to select only the *significant Univariate predictors* for the Discriminant Function Analysis. It was my intention to conduct the exploratory analysis in this manner to narrow the amount of predictor variables to use in the Discriminant Function Analysis.

Steps 1 and 2: Multivariate Analysis with Assessment of Univariate Analysis to Select Predictor Variables for Discriminant Function Analysis

The first stage of analyzing this data included conducting a MANOVA using all 53 predictor variables, and assessing their Univariate ANOVAs for their individual contributions to the model. The overall model was significant, indicating that drug-of-choice groups differ across the personality measures, when taken together: $F (106, 454) = 1.83$, $p < .001$, Wilks' Lambda = .49, partial $\eta^2 = .30$. Univariate analyses of all 53 predictors are provided in Table 6. Univariate ANOVAs revealed that 25 of the 53 variables significantly differed between groups. These 25 variables were selected for Discriminant Analysis.

Step 3: Discriminant Function Analysis

A discriminant analysis was performed with drug-of-choice group as the categorical dependent variable and the 25 personality variables selected from the previous Univariate ANOVAs. A total of 282 cases were analyzed. I adjusted for unequal group size. Because there are three groups in the DV (Depressant/Opiate/Stimulant), two discriminant functions are calculated. The first discriminant function accounted for 77.3 % of the variance and significantly

discriminated groups (chi square = 96.61, df = 50, $p < .001$). The second function accounted for the remaining 22.7% of the variance, but did not significantly discriminate groups (chi square = 23.62, df = 24, $p = .48$). In discriminant analysis, a structure matrix is calculated that indicates the clusters of variables that significantly contribute to each function. The structure matrix of this analysis, outlined in Table 7, showed that the following 11 variables contributed to the first (significant) function: Antisocial Tendencies (ANT; PAI), Antisocial Practices (ASP; MMPI-2), Naiveté (PA3; MMPI-2); Paranoia (PAR; PAI), Amorality (Ma1; MMPI-2), Somatic Complaints (SOM; PAI), Depression (PAI); Cynicism (CYN; MMPI-2); Need for Affection (Hy2; MMPI-2); Poignancy (Pa2; MMPI-2), and Physical Malfunctioning (Dep-3; MMPI-2). Descriptions of these scales are provided in Appendix D. Overall, the discriminant function model successfully predicted 69.9% of individuals' drug-group membership, with accurate predictions being made for 90.3% of depressant addicts.

The correlations between the discriminant function and predictor variables suggest that the difference between groups is characterized by depressant addicts displaying less antisocial and paranoid attitudes/feelings towards others, and being less aware of negative and intense emotional experience. More specifically, depressant addicts display lower levels of antisocial behavior and attitudes than opiate addicts, are more trusting and less hostile towards others, experience lower levels of depression and somatic problems, have more of a need for affection, are less sensitive than opiate addicts. These findings are important to discuss in lieu of the Self-Medication theory.

Discussion and Conclusion

Overall, research findings from this study provide partial support for the Self-Medication theory, particularly in terms of understanding personality differences in individuals addicted to Depressants and Opiates.

Group 1: Depressants

According to Khantzian's (2003) theory, individuals addicted to a depressant (alcohol, benzodiazepine, or barbiturate) inhibit and over-contain their emotional experience, using rigid defenses such as repression and denial. The use of a depressant acts to soften this rigid defensive structure and reduce an individual's internal tension state. Operating in this manner, alcoholics are notoriously alexithymic and present with flattened affect (de Timay, Luts, Hers, & Luminet, 2008; Aguilar de Arcos et al., 2005). I hypothesized that depressant users would reflect Khantzian's proposed style of emotional functioning in presenting with higher levels of Emotional Inhibition, Repression, and Over-controlled Hostility, while also reporting lower levels of Subjective Depression, Paranoia, and Aggression than other drug groups.

In partial support of the first hypothesis, Multivariate analysis indicated that Depressant addicts respond differently than Other addicts across the six predicted scales taken together. Group differences on all six of the relevant scales were in the predicted direction, four significantly. Specifically, as predicted, the Depressant group presented with significantly lower levels of Paranoia, Depression, and Aggression, and significantly higher levels of Over-controlled Hostility when compared to other addicts. The Depressant group also had higher, but

not significant, levels of both Emotional Inhibition and Repression. Group differences on these two variables were not significant, but in the predicted direction.

According to research, alcoholics suffer from depressive disorders, and at a much higher level among the treatment-seeking population (Grant et al., 2004). As such, the groups' significantly lower scores in Subjective Depression, or feelings of dysphoria, anhedonia, fatigue, and low self-confidence likely reflect a substantial level of denial. Additionally, depressant addicts rigidly contain their emotional experience as a secondary means of controlling, or "cutting off" affect (Khantzian et al., 1990).

I observed the Depressant group to employ a much higher level of defensiveness and to report lower levels of symptomology/psychopathology than other groups. This aspect is consistent with the Self-Medication theory. Contrary to recent research (Suh et al., 2008) I did not find repression or emotional inhibition to significantly differ between drug groups. In creating his hierarchy of ego defenses, George Valliant (1994) characterized repression as a more developed, or "neurotic" defense than that of denial, which is considered more primitive. Depressant addicts seeking treatment are considered to have higher occurrences of both Axis I and II pathology (Grant et al., 2004), and being an "acute" population, could also have less developed defenses, and thus do not present with this repressive/neurotic style.

Group 2: Opiates (narcotics, analgesics)

The Self-Medication theory posits that individuals identified as addicted to an opiate, narcotic, or analgesic use the drug to attenuate feelings of aggression, rage, and depression often associated with trauma. Opiate addicts rarely posses a defensive structure able to regulate

overwhelming emotion. Instead, there is collapse (i.e. psychic trauma) (Khantzian, 1999; Khantzian, Mack, & Schatzberg, 1999; Dodes, 1990). In the case of opiates, the drug serves as a replacement for a defect in an individual's capacity to cope. Opiates mute psychic pain, blunt acute helplessness, and unburden an already compromised ego structure (Kohut, 1966; Wurmser, 1974; Khantzian, 1999; Dodes, 2009). I hypothesized that Opiate addicts would have higher levels of Subjective Depression, Post-Traumatic Stress, Cynicism, Aggression, and Antisocial Tendencies, and lower levels of Ego Strength than other addicts.

In partial support of the second hypothesis, Multivariate analysis indicated that Opiate addicts respond differently than Other addicts across the seven predicted scales taken together. Five of the seven predictor variables were significant, and all group differences were in the hypothesized direction. I found opiate addicts to display significantly higher levels of Subjective Depression, Cynicism, Antisocial Tendencies, and Post-Traumatic Stress than other groups. Concurrent with Self-Medication theory, the Opiate group also had significantly lower levels of Ego Strength than other addicts. I found the Opiate group to have higher levels of Insufficient Self-Control and Aggression than others, although these were trends, and did not reach significance. Taken together, these results are in keeping with Self-Medication theory, and are unlikely to occur under null conditions.

Group 3: Stimulants

The Self-Medication theory identifies stimulant abusers as being either "high" or "low" energy, using stimulants to displace affect related to depression. The "low" energy stimulant abusers are characteristically anhedonic, using stimulants to provide a rush of energy to

counteract depressive states. Those labeled as "high" energy have a magnified need for excitement, and use cocaine to maintain a hypomanic state, actively avoiding their depression (Khantzian et al., 1990 Khantzian & Albanese, 2008). I hypothesized that stimulant addicts would present differently than others in having higher levels of Paranoia, Cynicism, Subjective Depression, Insufficient Self-Control, and Psychomotor Acceleration.

Multivariate analysis of the Stimulant group did not confirm predicted differences between stimulant users and other addicts. Four of the five predictor variables followed the hypothesized direction. Still, neither the parametric nor the non-parametric analysis suggest the findings stray from a random process.

It is tempting to attribute the failure of hypothesis three to low power (n = 28). Still, the group differences were very small, even if four of the five were in the predicted direction. Even *with* more power, the effect size is anemic. More likely these findings reflect either a mistranslation of the theory, or a failure of the theory itself. With Khantzian proposing two "types" of cocaine addicts (one "low" depressed, and one "high" manic), I might better have *first* investigated to see if cocaine addicts do indeed have different response styles. If "low" and "high" energy groups exist, their response styles would likely differ in their levels of hypomania and experienced depression.

Recent research (Suh et al., 2008) providing empirical support for the Self-Medication theory found Psychomotor Acceleration (Ma2, MMPI-2) to predict stimulant addiction, which I could not replicate. The same study did not observe any significant findings surrounding cocaine

addiction and depression, and suggested using alternative scales to capture the relationship (which I did, and still found no significance).

Khantzian (1999) himself states that not all cocaine addicts suffer with clearly identifiable depression. Research has also revealed a drastic drop in cocaine addicts' depression rates from a once-estimated 50% to as low as 21% in treatment samples, with a concurrent rise in rates of Antisocial Personality Disorder, which is now thought to affect between 45-55% of individuals addicted to cocaine (Weiss et al., 1988; Gawin & Kleber, 1984; Goldstein et al., 2007; Poling, Kosten, & Sofuoglu, 2007). Also, individuals dependent on cocaine have higher rates of childhood ADHD, estimated at 35%, and reportedly use cocaine to treat their symptoms (Carroll & Rounsaville, 1993; Somoza et al., 2004; Gawin & Kleber, 1986). Theorists agree that stimulant addicts display higher levels of sensation/stimulus-seeking behavior and impulsivity, which also reflect antisocial and/or attention-disordered traits (Khantzian, 1999; Poling et al., 2007). This also provides an alterative explanation for why Suh et al. (2008) found Psychomotor Acceleration to be related to cocaine addiction. According to Hathaway & McKinley (1989), "individuals scoring high in Psychomotor Acceleration are tense, restless, and excited…easily bored and may seek out risk, excitement, or danger as a way of overcoming their boredom". This can be interpreted as a "flight from depression", but also could be due to an attention-deficit or related to antisocial tendencies. Although the sample size in stimulant addiction was small, with the alternative explanations posed and changes in the population's epidemiology and treatment-seeking characteristics documented, further research and possible revisions to this aspect of Khantizian's theory may be necessary.

In sum, it may be that the psychological makeup of stimulant addicts is more heterogeneous than other addict groups, thus presenting a special challenge for theory and research.

Exploratory Analysis

I conducted a post-hoc analysis to explore trends of personality and emotional functioning that differentiated between drug-of-choice groups, outside of the theory of self-medication. I examined all personality variables across the PAI and MMPI-2, including Harris-Lingoes and Supplementary Scales. After paring down predictor variables in a Discriminant Analysis, I found that 11 particular variables can discriminate Depressant addicts from Opiate addicts. I could not discriminate Stimulant addicts from others. The observed differences surrounded themes of paranoia, antisociality, and sensitivity to feeling.

Compared to Opiate addicts, Depressant addicts display lower levels of antisocial attitudes and behavior, are more trusting, hold unrealistically optimistic attitudes about other people, experience fewer problems with depression and health concerns, and are less sensitive, while also possessing more of a need for affection and support from others. Opiate addicts appear highly sensitive to physical symptoms (e.g. of depression), health concerns, and experience themselves as emotionally high-strung. These differences reflect the defensive functioning earlier noted about both addiction groups: Depressant addicts are extremely defensive and deny most problems, whereas Opiate addicts are more overwhelmed by intense affect and have little faith in others. Also, these results shed light on the known conflict that alcoholics have with issues of dependency and the anxiety this produces. These findings,

congruent with Self-Medication and other research on alcoholism and social anxiety disorder, suggest that alcoholics are more rigidly controlled around others and experience extreme discomfort surrounding emotional closeness and social relationships, yet hold an intense need for others' affection and support (Buckner et al., 2008; Lepine & Pellissolo, 1998; Schneier et al., 2010; Terra et al., 2006; Khantzian & Albanese, 2008). Furthermore, Depressant addicts naively overvalue themselves/others, which ultimately results in an abysmal sense of frustration, letdown, and helplessness when these idealizations fall apart, leading to an addictive search (Wurmser, 1974; Dodes, 1990).

The ability to discriminate between groups was only successful in Depressant addicts being correctly classified. This analysis had no theoretical basis, and did not have findings strong enough to draw any conclusions or theoretical implications. I was much more successful in the theory-driven hypotheses assessing differences in personality based on drug-of-choice selection.

The omnibus theory that addicts differ in their emotional and characterological functioning based on drug-of-choice was supported for both Depressant and Opiate addicts. Our first and second hypotheses were partially confirmed; significantly delineating the defensive processes employed by Depressant and Opiate addicts. The theory-based hypothesis about how stimulant addicts differ from other addicts faired less well. Still, taken together, findings support the notion that Self-Medication theory informs us about how personality is associated with drug of choice. Across the three hypotheses, there were 18 predictions (six for hypothesis I; seven for hypothesis II; and five for hypothesis III). Of the 18 group comparisons, 17 were in the

predicted direction; 9 were significantly different differences; and the a-priori MANOVA for hypotheses I and II were statistically significant.

Previous work on testing the Self-Medication theory has had limited success (e.g. Craig et al., 1988; Green et al., 1993; Castenda et al., 1994). In agreement with Suh et al. (2008), I believe this research did not correctly assess emotional constructs, using broad assessments incapable of recognizing nuances between groups. More recent work providing support for Self-Medication (e.g. Henwood & Padgett, 2007; Suh et al., 2008), including this project, used assessments that better targeted the underlying emotional functioning of addicts, where differences between groups linger.

Of note is our ability to accurately assess each individual's drug-of-choice. An advantage I had in working with a clinical treatment sample was the large amount of information I had access to. I created an algorithm that used a stepwise decision-making process, evaluating each individual's self-reported usage, drug screens, doctor's interview, finalized diagnosis (at treatment exit), and psychological assessments to determine their preferred substance. The diagnoses given to each individual are decided upon in treatment team meetings, and routinely reviewed by medical, psychiatric, and clinical professionals over the course of each individual's treatment stay on a weekly basis. It is likely that the methods of diagnosing individuals at least parallels that obtained through a short diagnostic interview such as the SCID-I (First et al., 1997). Using a finalized diagnosis after each individual had gone through treatment also allowed for the potential minimization of problems at treatment entry to subside, which had been a concern in previous studies. With dual raters, our reliability was very strong (91%). The most challenging cases to categorize were those with complex poly-substance dependence, which

generally fell in the "undifferentiated" category. For reference, brief explanations of the 11 individuals with no drug-of-choice delineated are in Appendix E.

Although working with a clinical sample and having access to a plethora of information on each patient was an advantage of this study, hypothesis testing in such a complex population is a difficult endeavor. I did not have the luxury of assessing individuals after a long period of abstinence, nor could I directly observe pre-addiction personality. As such, there remains an argument for the potential impact of extended drug use or withdrawal driving or altering personality characteristics. Per treatment protocol at Cornerstone of Recovery, individuals experiencing withdrawal symptoms are identified upon treatment entry and adequately medicated/detoxified prior to completing assessment measures. It is my expectation that this protocol, combined with the elimination of invalid assessments from the sample (which reduced the sample size by 27%), controlled for the possibility that withdrawal symptoms effected assessment results. Also, researchers have found that even after an extended period of sobriety, substance abusers remained deficient in their emotional regulation abilities, and that psychiatric illnesses such as depression and post-traumatic stress generally precede substance use (Thorberg & Lyvers, 2005; Jacobsen, Southwick, & Kosten, 2001; Deykin, Levy, & Wells, 1986). Still, this remains a limitation of the study. These conclusions are also limited by the sample's retrospective and cross-sectional nature. In order to thoroughly understand the impact of emotionality on drug-of-choice, longitudinal studies are necessary.

The Self-Medication theory is not an "all-encompassing" model of addiction, but rather, a theory of how personality relates to addictions. Khantzian (2003) stresses integration between fields of thought, believing that more complimentary material exists rather than competition in

studying addiction. This has been historically minimized, especially with the dominance of biological (e.g. "addiction-as-disease") models of substance abuse, and advances in neuroscience overshadowing psychological aspects of health and disease (Graham et al., 2008). The compelling nature of drug dependence cannot be sufficiently explained by simplistic formulations without including more in-depth psychological issues that perpetuate addicts' suffering (Khantzian, 1999). Self-Medication appreciates the influence of genetic and biological influence on addictive disorders, and does not ignore social/economical factors that influence their development. Khantzian maintains that the Self-Medication approach should be considered in parallel with other approaches and not in competition with them (Khantzian & Albanese, 2008). Understanding the role of personality and emotional functioning in addictions is important to theorists and clinicians alike. The continued understanding of addicts from a clinical, or "humanized" perspective is much needed for clinicians to undo early biases that addicts are "untreatable" in psychodynamic psychotherapy.

Future research: Replication, Refinement, and Integration

Along with the recent research, this study provides some promising evidence for the validity of the Self-Medication theory. Although having similar project aims, this investigation had strikingly different sample characteristics than Suh et al. (2008). The sample for this investigation was primarily white, educated, mostly employed, health-insured, and enrolled in inpatient treatment. For Suh et al. (2008), the sample had a much richer ethnic distribution (67% African-American, 19% Hispanic, 7% Caucasian), only 50% had graduated high school, were of lower socioeconomic status, were taken from an outpatient 16-week vocational program,

and had a much higher proportion of individuals abusing crack/cocaine (31%). Both studies, although characteristically diverse, provide support for the Self-Medication theory. This further highlights the need for continued use of the Harris-Lingoes and Content scales of the MMPI-2 in future research. Additional research could also help clarify differences found in this Stimulant population compared to Suh et al. (2008), to determine whether the current findings are due to differences in sample characteristics, or perhaps reflect the hypothesized changing nature of the Stimulant addict from depressed to antisocial characters.

Difficulties in emotion regulation and defense are core concepts of Self-Medication theory, and remain major risk factors for relapses post-treatment (Marlatt & Gordon, 1985; Gossop, Stewart, Browne, & Marsden, 2002; Brown, Vik, Patterson, Grant, & Schuckit, 1995; Brown et al., 1990). Clinicians can use this theory to deepen their understanding of addicted patients through drug preference, guide treatment strategies, and by better targeting individuals' difficulties, likely reducing the chance of relapse. Often, prematurely labeling addiction as a "disease" and individuals as having an "addictive personality" precludes deeper understanding of individualized conflicts that propel drug use. I suggest instead, as proposed by Crits-Christoph and colleagues (2008), that while in treatment, addicts take time to understand their drug use in relation to their interpersonal and intrapsychic world (Crits-Christoph et al., 2008; Mark & Luborsky, 1992). When undertaking psychotherapy with an addict or alcoholic, concepts derived from Self-Medication theory could help provide clinicians with scaffolding to structure the treatment process. With knowledge of alcoholics' rigid defense system and disavowal of feeling, treatment needs to combine supportive and behavioral intervention strategies through methods of understanding, addressing, and working through. Clinicians should focus on

encouraging emotional expression while providing a supportive and non-judgmental environment, and having alcoholics begin to verbalize their unexpressed feelings. For the opiate addict, this work focuses more on containment and learning how to titrate emotional expression. These are two very different constructs to teach in group settings, and could be individualized to Opiate and Depressant groups. For both groups, of great importance is the understanding of current defenses, their maladaptive nature, and replacing them with more evolved and adaptive coping skills.

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Tables

Table 1A: An Inter-rater Reliability Breakdown Between Raters 1 and 2 when rating Drug-of-Choice Group based on Algorithm.

Rater 2 (below)	Rater 1					
	Depressant	Opiate	Stimulant	Marijuana	Undifferentiated	Total
Depressant	33	0	0	0	1	34
Opiate	0	24	0	0	1	25
Stimulant	1	0	5	0	1	7
Marijuana	0	0	0	3	0	3
Undifferentiated	0	0	0	0	1	1
Total	34	24	5	3	4	N =70

*Note: Kappa = 0.91, SE = 0.043, p <0.001

*Note: Details of the 4 "missed" cases:

1. Case #35:
    a. Rater 1: Opiate, Marijuana, & Alcohol Dependency
    b. Rater 2: Opiate Dependency
2. Case #47:
    a. Rater 1: Alcohol & Marijuana Dependency
    b. Rater 2: Alcohol Dependency
3. Case #209
    a. Rater 1: Alcohol Dependency
    b. Rater 2: Cocaine Dependency
4. Case #256
    a. Rater 1: Alcohol & Adderall Dependency
    b. Rater 2: Alcohol Dependency

Table 1B:

Bivariate Correlations of Predictor Variables

	PAR	ANT	AGG	EI	ISC	DEP1	MA2	R	ES	OH	PK	CYN
PAR	--	.51**	.50**	.35**	.33**	.48**	.31**	-.15**	-.41**	-.35**	.57**	.60**
ANT		--	.56**	.30**	.43**	.34**	.44**	-.32**	-.29**	-.34**	.49**	.42**
AGG			--	.31**	.33**	.18**	.43**	-.45**	-.16**	-.39**	.36**	.45**
EI				--	.58**	.36**	.23**	-.11	-.38**	-.32**	.46**	.37**
ISC					--	.53**	.27**	-.07	-.50**	-.39**	.58**	.36**
DEP1						--	.23**	.17**	-.75**	-.40**	.84**	.32**
MA2							--	-.52**	-.35**	-.40**	.45**	.46**
R								--	-.01	.35**	-.15*	-.42**
ES									--	.35**	-.81**	-.39**
OH										--	-.49**	-.46**
PK											--	.52**
CYN												--

Note: *$p < 0.05$, **$p < 0.01$, PAR = Paranoia (PAI), ANT = Antisocial (PAI), AGG = Aggression (PAI); EI = Emotional Inhibition (YSQ), ISC = Insufficient Self-Control (YSQ), DEP1 = Subjective Depression (MMPI), MA2 = Hypomania (MMPI), R = Repression (MMPI), ES = Ego Strength (MMPI), OH = Over-controlled Hostility (MMPI), PK = Post-Traumatic Stress (MMPI), CYN = Cynicism (MMPI).

Table 2: Male-Female Distribution Across Drug-of-Choice Groups, and Male-Female Differences on the 12 Predictor Variables

Variable	Males (n = 208)	Females (n = 94)	Chi sq	Sig.
Drug Group				
Depressant	116 (55.8%)	57 (60.6%)	0.733	.69
Opiate	67 (32.2%)	28 (29.8%)		
Stimulant	25 (12.0%)	9 (9.6%)		
Variable			t	
Paranoia	51.79 (10.57)	52.57 (11.01)	-0.61	.54
Antisocial	59.10 (11.85)	57.17 (13.45)	1.31	.19
Aggression	51.77 (13.38)	50.55 (12.71)	0.76	.44
Emotional Inhibition	9.01 (12.37)	9.44 (11.26)	-0.29	.77
Insufficient Self-Control	22.19 (21.10)	28.08 (23.04)	-2.24	.03
Subjective Depression	61.24 (14.36)	67.98 (15.16)	-3.73	.001*
Hypomania	51.14 (10.45)	51.22 (10.28)	-0.06	.95
Repression	52.14 (9.99)	54.89 (9.89)	-2.23	.03
Ego Strength	43.47 (13.44)	39.57 (13.86)	2.32	.02
Over-Controlled Hostility	51.19 (10.05)	49.50 (10.18)	1.33	.19
Post-Traumatic Stress	59.41 (15.72)	64.68 (14.75)	-2.76	.006
Cynicism	50.80 (10.31)	50.47 (10.19)	0.25	.80

Note: After using a Bonferroni correction of (0.05/12), the significance level was adjusted to $p < 0.004$. As such, gender was only significantly correlated with Subjective Depression (*).

Table 3: Hypothesis I: Univariate analysis of the 6 measures hypothesized to differentiate Depressant addicts from Other (Opiate/Stimulant) addicts, with an assessment of whether group differences are in the predicted direction.

Variable	Depressant Mean	Other Mean	F	p	Partial Squared Eta	Predicted Direction?
Paranoia	50.20 (10.54)	55.52 (10.95)	16.34	.001	.057	Yes
Aggression	50.20 (12.64)	53.58 (14.18)	4.29	.039	.016	Yes
Repression	53.29 (10.01)	53.17 (10.38)	0.004	.953	< .001	Yes
Over-controlled Hostility	51.78 (9.62)	48.27 (10.49)	8.17	.005	.029	Yes
Subjective Depression	61.38 (14.63)	67.68 (14.45)	12.43	.001	.044	Yes
Emotional Inhibition	9.87 (13.45)	8.92 (10.45)	0.39	.531	< .001	Yes

Table 4: Hypothesis II: Univariate analysis of the seven measures hypothesized to differentiate Opiate addicts from Other (Depressant/Stimulant) addicts, with an assessment of whether group differences are in the predicted direction.

Variable	Opiate Mean	Other Mean	F	p	Partial Squared Eta	Predicted Direction?
Post-Traumatic Stress	65.39 (14.79)	60.18 (15.29)	6.91	.009	.025	Yes
Subjective Depression	67.66 (14.58)	62.34 (14.71)	7.68	.006	.028	Yes
Cynicism	54.16 (9.62)	49.51 (10.17)	12.66	.001	.045	Yes
Ego Strength	39.26 (13.50)	42.96 (13.50)	4.38	.037	.016	Yes
Insufficient Self-Control	26.95 (22.66)	23.42 (21.30)	1.54	.216	.006	Yes
Aggression	53.52 (14.99)	50.63 (12.55)	2.73	.100	.010	Yes
Antisocial Tendencies	63.74 (13.16)	56.44 (11.05)	22.56	.001	.077	Yes

Table 5: Hypothesis III: Univariate analysis of the 5 measures hypothesized to differentiate Stimulant addicts from Other (Depressant/Opiate) addicts, with an assessment of whether group differences are in the predicted direction.

Variable	Stimulant Mean	Other Mean	F	p	Partial Squared Eta	Predicted Direction?
Subjective Depression	67.41 (14.48)	63.63 (14.87)	1.58	.21	.006	Yes
Cynicism	50.78 (9.20)	50.99 (10.34)	0.01	.92	<.001	No
Psychomotor Acceleration	52.67 (9.58)	51.05 (10.57)	0.58	.45	.002	Yes
Insufficient Self-Control	26.56 (24.68)	24.31 (21.46)	0.26	.61	.001	Yes
Paranoia	52.93 (9.75)	52.38 (11.18)	0.06	.81	<.001	Yes

Table 6: Univariate Analyses as a product of MANOVA across all personality variables for post-hoc exploratory analysis; significant results used as selection criteria for Discriminant Function Analysis to follow.

Variable	Abbrev	Depressant Mean	Opiate Mean	Stimulant Mean	F	p
Somatic Complaints	SOM	53.32 (11.05)	59.19 (12.72)	56.03 (11.45)	7.41	.001
Anxiety	ANX	58.73 (14.36)	59.43 (12.58)	61.00 (13.76)	0.346	.71
Anxiety-Related Disorder	ARD	56.53 (13.24)	55.77 (12.13)	56.96 (13.43)	0.135	.87
Depression	DEP	60.27 (14.73)	67.49 (14.04)	65.39 (13.83)	7.64	.001
Mania	MAN	49.93 (10.67)	51.21 (11.08)	46.10 (9.37)	2.43	.09
Paranoia	PAR	50.26 (10.50)	56.13 (11.39)	53.00 (9.56)	8.76	.001
Schizophrenia	SCZ	52.81 (12.26)	55.73 (10.92)	56.64 (12.00)	2.48	.09
Borderline Features	BOR	59.10 (13.49)	63.94 (12.51)	64.39 (13.35)	4.83	.009
Antisocial Features	ANT	55.91 (11.18)	63.72 (13.01)	59.43 (10.51)	12.87	.001
Aggression	AGG	50.50 (12.83)	53.84 (14.90)	53.78 (11.64)	2.11	.12
Suicidal Ideation	SUI	52.87 (14.03)	55.01 (14.91)	56.07 (18.51)	0.94	.39
Stress	STR	58.46 (12.99)	62.04 (10.93)	61.28 (15.10)	2.53	.08
Nonsupport	NON	50.45 (11.63)	52.70 (12.41)	57.11 (11.53)	4.11	.02

Table 6 Continued

Variable	Abbrev	Depressant Mean	Opiate Mean	Stimulant Mean	F	p
Treatment Rejection	RXR	36.08 (10.25)	33.99 (9.10)	33.82 (10.00)	1.59	.21
Dominance	DOM	49.42 (11.37)	46.69 (12.09)	46.00 (12.14)	2.14	.12
Warmth	WAR	50.28 (11.71)	48.66 (10.78)	46.50 (10.72)	1.61	.20
Subjective Depression	D-1	61.44 (14.72)	67.09 (14.58)	67.75 (14.33)	5.40	.005
Psychomotor Retardation	D-2	55.38 (11.97)	57.06 (12.60)	61.10 (12.77)	2.76	.06
Physical Malfunctioning	D-3	59.44 (14.27)	64.73 (14.92)	61.46 (14.75)	3.94	.02
Mental Dullness	D-4	60.57 (15.73)	64.15 (15.73)	69.21 (16.06)	4.26	.01
Brooding	D-5	58.76 (13.81)	62.40 (11.93)	62.82 (13.01)	2.76	.06
Denial of Social Anxiety	Hy-1	50.07 (10.27)	48.53 (10.71)	50.10 (10.33)	0.67	.51
Need for Affection	Hy-2	51.84 (10.59)	47.74 (11.37)	49.82 (10.51)	4.17	.02
Lassituude-Malaise	Hy-3	61.94 (15.62)	68.28 (16.17)	69.21 (17.23)	5.82	.003
Somatic Complaints	Hy-4	54.97 (14.45)	61.17 (15.90)	61.57 (14.31)	6.09	.003
Inhibition of Aggression	Hy-5	48.27 (9.89)	46.76 (10.02)	45.64 (9.44)	1.24	.29
Familial Discord	Pd-1	52.94 (11.55)	56.88 (12.77)	60.03 (11.65)	6.01	.003

Table 6 Continued

Variable	Abbrev	Depressant Mean	Opiate Mean	Stimulant Mean	F	p
Authority Problems	Pd-2	55.64 (10.40)	55.87 (10.59)	59.46 (8.20)	1.69	.19
Social Imperturbability	Pd-3	51.23 (10.01)	50.13 (9.74)	50.89 (10.41)	0.35	.70
Social Alienation	Pd-4	60.19 (11.34)	62.26 (10.55)	62.35 (9.28)	1.26	.28
Self-Alienation	Pd-5	65.09 (13.63)	68.23 (12.82)	68.86 (13.70)	2.09	.13
Persecutory Ideas	Pa-1	58.59 (12.46)	61.49 (11.26)	61.50 (12.02)	2.00	.14
Poignancy	Pa-2	56.16 (11.30)	59.89 (9.78)	56.78 (10.87)	3.50	.03
Naivete	Pa-3	52.41 (9.46)	46.66 (10.10)	50.71 (10.74)	9.94	.001
Social Alienation	Sc-1	52.42 (12.61)	57.23 (12.84)	58.39 (12.82)	5.57	.004
Emotional Alienation	Sc-2	57.76 (16.60)	61.24 (17.58)	62.00 (18.65)	1.58	.21
Lack of Ego Mastery-Cognitive	Sc-3	57.15 (16.11)	61.79 (16.18)	65.21 (18.53)	4.26	.02
Lack of Ego Mastery-Conative	Sc-4	57.27 (15.85)	64.80 (17.34)	66.42 (17.59)	7.97	.001
Lack of Ego Mastery-Defective Inhibition	Sc-5	57.15 (13.35)	58.82 (12.75)	59.85 (12.36)	0.80	.45
Bizarre Sensory Experiences	Sc-6	57.66 (16.59)	59.88 (14.91)	59.75 (11.43)	0.67	.51
Amorality	Ma-1	50.93 (9.61)	56.03 (10.74)	51.17 (12.78)	7.32	.001

Table 6 Continued

Variable	Abbrev	Depressant Mean	Opiate Mean	Stimulant Mean	F	p
Psychomotor Acceleration	Ma-2	50.75 (10.59)	52.04 (10.26)	52.17 (9.75)	0.71	.49
Imperturbability	Ma-3	48.50 (9.48)	50.05 (9.51)	46.71 (9.17)	1.54	.21
Ego Inflation	Ma-4	52.04 (11.10)	54.28 (12.06)	52.28 (11.40)	1.13	.32
Anxiety	A	55.46 (13.11)	60.83 (12.53)	60.71 (13.46)	5.79	.003
Repression	R	53.01 (10.16)	52.46 (10.44)	54.50 (10.15)	0.42	.65
Ego Strength	Es	43.56 (13.64)	39.79 (13.67)	40.25 (12.46)	2.50	.08
Over-controlled Hostility	O-H	51.75 (9.67)	48.95 (10.82)	46.92 (10.12)	4.04	.02
Post-Traumatic Stress	Pk	59.27 (15.40)	64.76 (14.92)	65.42 (14.88)	4.75	.009
Anger	ANG	52.32 (11.95)	54.10 (14.03)	56.82 (11.40)	1.77	.17
Cynicism	CYN	49.25 (10.35)	54.07 (9.96)	50.53 (9.11)	6.59	.002
Antisocial Practices	ASP	50.87 (9.46)	57.41 (11.65)	53.00 (8.78)	12.00	.001
Negative Treatment Indicators	TRT	55.06 (13.76)	60.41 (13.78)	63.07 (13.26)	6.90	.001

Table 7: Exploratory Analysis: Discriminant Function Analysis Across Personality Variables Identified as Significant from Previous Univariate Analysis; Factor Structure Matrix

Variable	Function 1	Function 2
Antisocial Traits (PAI)	.52*	-.30
Antisocial Practices (MMPI-2)	.51	-.21
Naiveté (MMPI-2)	-.47*	.18
Paranoia (PAI)	.43*	-.26
Amorality (MMPI-2)	.41	-.03
Somatic Complaints (PAI)	.39*	-.23
Cynicism (MMPI-2)	.38*	-.13
Depression (PAI)	.37*	-.35
Need for Affection (MMPI-2)	-.29*	.19
Poignancy (MMPI-2)	.28*	-.06
Physical Malfunctioning (MMPI-2)	.27*	-.24
Familial Discord (MMPI-2)	.20	-.58*
Negative Treatment Indicators (MMPI-2)	.25	-.57*
Nonsupport (PAI)	.09	-.54*
Lack of Ego Mastery-Conative (MMPI-2)	.31	-.54*
Mental Dullness (MMPI-2)	.12	-.53*
Lack of Ego Mastery-Cognitive (MMPI-2)	.17	-.48*
Over-Controlled Hostility (MMPI-2)	-.17	.46*
Social Alienation (MMPI-2)	.26	-.46*
Lassitude-Malaise (MMPI-2)	.27	-.44*

Table 7 Continued

Variable	Function 1	Function 2
Somatic Complaints (MMPI-2)	.29	-.43*
Subjective Depression (MMPI-2)	.27	-.42*
Anxiety (MMPI-2)	.29	-.40*
Post-Traumatic Stress (MMPI-2)	.25	-.40*
Borderline Features (PAI)	.26	-.39*

*Note: * indicates the function that each variable contributes to in the above Structure Matrix*

Table 8: Discriminant Function Analysis Classification Results

		Predicted			
	Drug Group	Depressant	Opiate	Stimulant	Total
Original	Depressant	149	14	2	165
		(90.3%)	(8.5%)	(1.2%)	
	Opiate	41	45	3	89
		(46.1%)	(50.6%)	(3.4%)	
	Stimulant	21	4	3	28
		(75.0%)	(14.3%)	(10.7%)	
	Total	211	63	7	N = 282

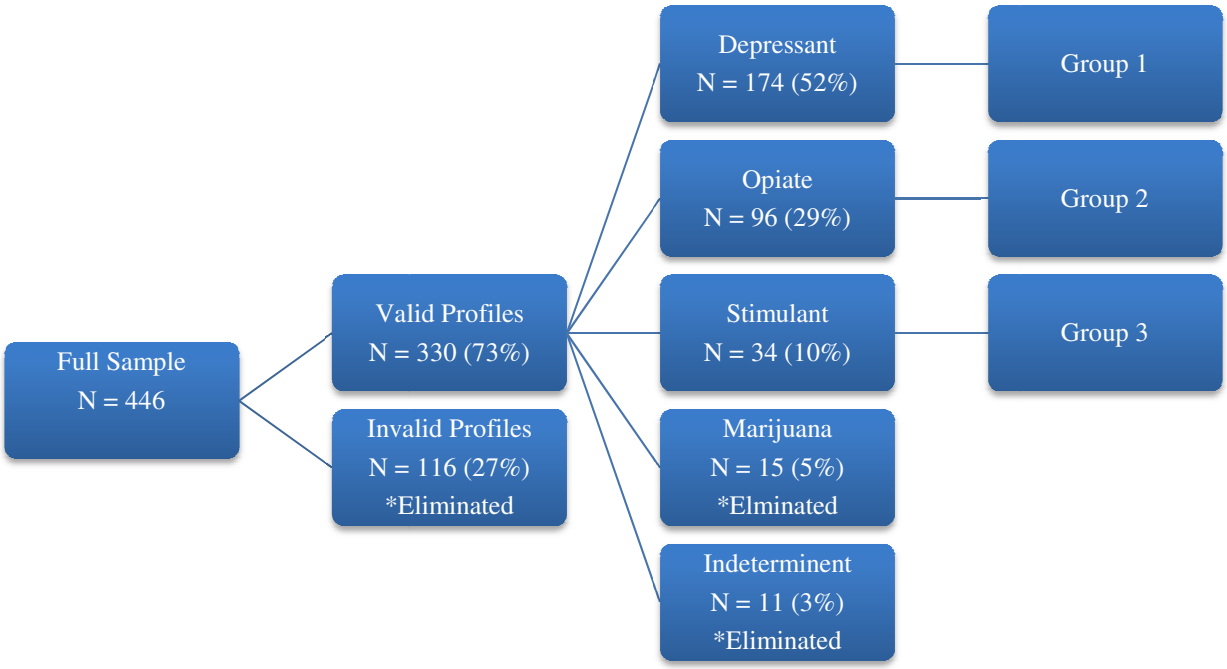

Figure 1: A visual representation of the classification process based on validity profiles and drug groups leading to the analyzable sample

Appendices

Appendix A: Notes on research studies conducted on the MMPI-2, PAI, ASI, YSQ, and SASSI-3

Minnesota Multiphasic Personality Inventory- II (Hathaway & McKinley, 1989)

Ben-Porath, McCully, & Almagar (2000)

- Measure assessed: Content scales of the MMPI-2
- Purpose: Incremental validity when compared to other self-report measures of personality and psychopathology (BDI-II; SCL-90-R; STAI; STAEI)
- Sample: N = 596 Kent State Undergraduate students
- Findings: Content scales add incrementally to prediction of variance on self-report measures above and beyond the clinical scales of the MMPI-2
- Limitations: Undergraduate sample, however, means and standard deviations were similar to Butcher's (1990) normative sample.

Ben-Porath, Butcher, & Graham (1991)

- Measure assessed: Content scales of the MMPI-2
- Purpose: to assess whether the MMPI-2 content scales could differentiate between Major Depressive Disorder and Schizophrenia diagnoses.
- Sample: N = 423 inpatient population, 76 formally diagnosed with Schizophrenia, 84 with Major Depressive Disorder.
- Findings: The most prominently elevated content scales corresponded with diagnoses (BIZ = Schizophrenia; DEP = Depression).
    - Furthermore, the content scales carried almost all of the predictive weight beyond clinical scales in their ability to differentiate diagnoses.

Lilienfeld (1999)

- Measure assessed: Harris-Lingoes Psychopathic Deviate (Pd) Scale
- Purpose: Construct validity when compared to other measures
- Sample: N = 414 undergraduate students (4 different sample groups)
- Findings: Supported construct validity. Several Pd scales assess different facets of psychopathology, with Pd2 (Authority Problems) targeting classical psychopathology, e.g. callousness and antisocial behavior.
- Limitations: Sample entirely undergraduate, Pd scale administered in isolation from entire MMPI-2.

Spiro et al. (2000)

- Measure assessed: MMPI-2
- Purpose: test-retest reliability, stability of measure
- Sample: 1,072 men followed over a five year period
- Findings:
    - Average test-retest correlation = 0.66

- Si (.85), Pt (.83), and A (.86) highly stable, Pa (.55) least stable

Personality Assessment Inventory (Morey, 1991)

Morey (1991, 1996)

- Measure assessed: PAI
- Purpose: development, reliability, internal consistency, test-retest reliability
- Sample:
  - 1,000 Normative
  - 1,051 College Students
  - 1,246 Clinical Population
- Findings:
  - Normative alpha = 0.81
  - College alpha = 0.82
  - Clinical alpha = 0.86
  - Test-retest reliability = 0.83
  - Mean inter-item correlation = 0.20

Kellogg et al. (2002)

- Measure assessed: PAI versus ASI
- Purpose: Convergent validity analysis of PAI Drug Problems Scale (DRG)
- Sample: N = 100 chemically dependent individuals versus control group
- Findings:
  - PAI DRG – ASI DRG Composite: $r = 0.61$, $p < 0.0005$
  - PAI DRG – ASI DRG Severity: $r = 0.67$, $p < 0.0005$
- Support for convergent validity
- Notes: Sample varied, no incentives to hide use, scale sensitive to differing degrees of drug problems.

Schinka (1995)

- Measure assessed: PAI Alcohol Problems Scale (ALC)
- Purpose: Internal consistency
- N = 185, inpatient substance use facility
- Findings:
  - Alpha = 0.75
  - Inter-item correlation = 0.21
- Support for internal consistency, paralleled Morey (1991)
- Notes: moderately severe population, primarily unemployed, mostly unmarried. Limited variance in scores, high means resulted in lower coefficients for Alcohol Problems and Treatment Rejection subscales when compared to Morey (1991).

Hopwood, Baker, & Morey (2008)

- Measure assessed: PAI
- Purpose: Extratest validity of PAI scales and indicators in forensic contexts to an inpatient substance abuse setting.
- Sample: N = 745 individuals court-mandated to inpatient substance-use treatment; majority with a history of violent behavior.
- Findings:
    - Aggression scale/subscales significantly differentiated individuals with or without a history of criminal assault.
    - Antisocial scale predicted rule infractions while in treatment.
        - Particularly when individuals also used drugs (not alcohol)
    - Suicidal and Suicidal Potential scales were elevated for individuals with a history of suicidal behavior.
- Notes: data was archival, limiting reliability assessment.

Parker, Daleiden, & Simpson (1999)

- Measure Assessed: PAI as compared to ASI
- Purpose: Convergent/discriminant validity of Alcohol Problems (ALC) and Drug Problems (DRG) scales of the PAI.
- Sample: N = 103 male veterans in residential treatment for Chemical Dependency
- Findings:
    - Internal Consistency:
        - Cronbach's Alpha for ALC = 0.92
        - Cronbach's Alpha for DRG = 0.78
        - Cronbach's Alpha for ASI Alcohol = 0.82
        - Cronbach's Alpha for ASI Drug = 0.75
    - Convergent Validity:
        - PAI ALC – ASI ALC: r = 0.49, p <0.01
        - PAI DRG – ASI DRG: r = 0.39, p <0.01
        - PAI ALC – Discharge Diagnosis: r = 0.47, p <0.01
        - PAI DRG – Discharge Diagnosis: r = 0.47, p <0.01
    - Discriminant Validity:
        - PAI ALC – ASI ALC > PAI ALC – All 16 other PAI/ASI Scales
        - PAI DRG – ASI DRG > PAI DRG – 13/16 other PAI/ASI Scales *
        - *Exceptions being ASI Psychiatric, ASI Family/Social Status, and PAI Mania showing greater correlations.
- Notes: support for convergent validity, excellent discriminant validity for PAI ALC scale but less impressive (although acceptable) discriminant validity of the PAI DRG scale. Lower alpha possibly attributed to decreased score variability than in normative samples.
- Note: Mixed race, urban and rural sample with a wide range of substance use diagnoses.

<u>Young Schema Questionnaire – 3rd Edition, Long Form (Young, 2005)</u>

Schmidt, Joiner, Young, & Telch (1995)

- Measure assessed: Young Schema Questionnaire
- Purpose: Psychometric properties, hierarchical structure of schemas (flagship publication)
- Sample: Five independent samples, N = 1,564; Three studies
    - Study 1: Factor analysis using UG sample
    - Study 2: Factor analysis using patient sample
    - Study 3: Convergent/Discriminant validity using UG sample
- Findings:
    - Study 1: 13 schemas revealed in student sample, found three higher-order factors (now domains), "disconnection", "over-connection", and "exaggerated standards".
    - Study 2: 15 schemas (of the 16 proposed). Differences between the patient and undergraduate sample were that two schemas merged into one factor in the first study, which were separate in the second study.
    - Study 3: Compared YSQ to BDI, DAS, PDQ-R, PANAS, SEQ, and SCL-90. Adequate convergent/discriminant validity demonstrated, as well as test-retest reliability.
- Limitations: the primary use of undergraduate samples to assess clinical measures, not having validity data on clinical populations, using the PDQ-R (self-report) to assess for personality disorders, and no other interviews to corroborate early maladaptive schema information (based solely on self-report).

Lee, Taylor, & Dunn (1999)

- Measure assessed: Young schema questionnaire
- Purpose: to assess the factor structure of the YSQ in a clinical sample
- Sample: N = 433, clinical population consisting of outpatient therapy clients and inpatients on an acute psychiatric unit in Perth, Australia.
- Findings:
    - Used Principal Component Analysis (PCA), found 14 factors to account for 60% of the sample's total variance.
    - "Social Undesirability was the only hypothesized factor that did not emerge; most of these items loaded into the "social isolation" schema. (also found in Schmidt et al., 1995)
    - Conducted a secondary higher-order factor analysis: found 4 factors
        - 1 = Impaired Autonomy, 2 = Disconnection, 3 = Impaired Limits, 4 = Over-control
    - Internal consistency demonstrated by corresponding factor structures found in two different countries/clinical populations.
    - Primary factor structure is stable across clinical samples with varying degrees of psychopathology, and higher-order factor structure is also consistent with theory and previous studies.

- Limitations: YSQ needs other validity studies, e.g. construct validity and clinicians' assessment of schemas corroborating YSQ.

Waller, Meyer, & Ohanian (2001)

- Measure assessed: Young schema questionnaire, long and short forms
- Purpose: to determine of psychometrics of short and long-form YSQ are comparable.
- Sample: N = 120; clinical group of bulimic patients and non-clinical comparison group (60/60)
- Findings:
    - Cronbach's alpha for clinical sample = 0.986 (long), 0.964 (short)
    - Cronbach's alpha for comparison sample = 0.974 (long) and 0.922 (short)
    - Cronbach's alpha for subscales were all above 0.80 on both long and short forms.
    - Correlations between both forms of the YSQ for each group were all greater than 0.84 ($p < 0.001$)
    - Long and short forms had comparable levels of discriminant validity, with very similar patterns of differences between groups on t tests and DFA.
- Conclusions: the YSQ-short form is interchangeable with the long-form, except in cases where clinicians would like to know a subtle picture of core beliefs for their patient.
- Limitations: female-only sample, much more research needs to be done on both forms of the Young Schema Questionnare.

<u>Substance Abuse Subtle Screening Inventory-3 (Miller, 1999)</u>

Lazowski et al. (1998)

- Measure assessed: SASSI-3
- Purpose: psychometric properties of recently revised version of the measure.
- Sample: N = 772 from a range of clinical settings, independently diagnosed with or without a substance dependence disorder.
- Findings:
    - The SASSI – 3 decision rule was in 95% agreement with clinical diagnoses of substance dependence; cross-validation was 97%.
    - Test-retest reliability ranged from 0.92-1.00.
    - Internal consistency = 0.93
    - Subtle scales added to this version significantly decreased the error rate when using face-valid scales alone.
    - Convergent validity demonstrated with the SASSI-3 being significantly correlated with other indices of substance abuse and clinical diagnoses.

<u>Addiction Severity Index—5th Edition (McLellan et al., 1992)</u>

Argeriou, McCarty, Mulvey, & Daley (1994)

- Measure assessed: ASI
- Purpose: to assess the validity of the ASI amongst a homeless population.
- Sample: N = 773 homeless or near-homeless individuals assessed four separate times over a one-year period.
- Findings: external validity demonstrated, clients with known relapses exhibited less improvement on five of the ASI measures (no changes demonstrated in family or legal problems). Women score significantly different than men, scores also differ by race and living status.
- Limitations: Additional studies are needed to build a normative database, considering the ASI is one of the most widely used measures in addiction and scores vary so much by demographic variables.

McLellan et al. (1992)

- Measure discussed: ASI—5th edition.
- Purpose: to discuss the updated version of the ASI, review measures and scoring, address problem areas, and provide normative data for addicts/alcoholics and special populations.
- Sample: normative data provided for alcoholics, opiate addicts, cocaine addicts, polysubstance abusers, pregnant substance abusers, homeless substance abusers, psychiatric abusers, and substance-abusing inmates.
- Findings: see article for normative data
- Limitations: ASI cannot be self-administered, must be done in an interview format, cannot be used with adolescents.

Appleby (1997)

- Measure assessed: ASI
- Purpose: Criterion validity, reliability, internal consistency, inter-rater reliability.
- Sample: 100 public psychiatric patients
- Findings:
    - Inter-rater reliability: Overall Intraclass Correlation Coefficient = 0.74
    - Internal consistency: Cronbach's alpha = 0.80 overall (ranging 0.7-0.9)
    - Criterion validity: supported. Strong relationships noted between drug and alcohol composite and severity scores and the CAGE, SMAST, CUAD, DAST, and drug screens.
    - ASI demonstrated diagnostic accuracy when compared to the SCID-P
- Limitations: questionable reliability of the psychiatric scale, employment scale needs some modification.

Appendix B

Measure	Variable	Code	Description	Relevance to SMH
MMPI-2[1]	Subjective Depression	Dep-1	Measures the tendency to feel unhappy or depressed, lack energy for coping with problems of everyday life, and lack interest in what goes on around them. Such persons tend to feel inferior, lack self-confidence, and feel uneasy in social situations	Stimulants: individuals experience higher levels of depression. Depressants: individuals tend to repress their depression
	Psychomotor Acceleration	Ma-2	Measures the tendency to have accelerated speech, thought processes, and motor activities. Individuals may feel tense, restless, and excited. They are easily bored and may seek out risk, excitement, or danger as a way of overcoming the boredom.	Stimulants: individuals have a propensity for mania
	Repression	R	Content measures the tendency to be conventional, submissive, and strive to avoid unpleasantness or disagreeable situations.	Depressants: tendency to inhibit and over-contain emotions.

	Ego Strength	Es	Content measures adaptability, resiliency, personal resourcefulness, and effective functioning.	Narcotics: individuals lack the capacity to deal with intense affect (low ego strength), regress into rage more easily.
	Overcontrolled Hostility	O-H	Measures an individuals' capacity to tolerate frustrations without retaliating.	Depressants: inhibit emotional experience, such as hostility and rage.
	Cynicism	Cyn	Content measures levels of anger and negative feelings towards self and others.	Narcotics: individuals have higher levels of aggression and rage, are more critical and punitive. Stimulants: higher levels of aggression when compared to CNS depressants (internalizing).
	Post-Traumatic Stress	Pk	Content measures a severity of trauma, including experiences of great emotional turmoil, intrusive thoughts, and feeling misunderstood and mistreated by others.	Narcotics: difficulties in managing rage/aggression are linked to early trauma and the lack of defensive or adaptive means to cope.
PAI[2]	Paranoia	PAR	Content addresses a vigilance in monitoring the environment for potential harm, a tendency to be resentful or hold grudges, and a readiness to spot inequities in the way one is treated by others.	Stimulants: individuals exhibit characterological and symptomoligical paranoia

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	Aggression	AGG	Content ranges from indicators of verbal assertiveness and poor anger control to violent and assaultive behaviors.	Narcotics: poor anger control, higher levels of aggression and rage (externalizing). Depressants: inhibit aggression.
	Antisocial Features	ANT	Content ranges from egocentricity, adventuresomeness, and poor empathy to items addressing antisocial tendencies and behaviors.	Narcotics: poor affect controls, tendency to externalize, risk-taking behaviors, and antisocial characteristics.
YSQ-3[3]	Emotional Inhibition	EI	The excessive inhibition of spontaneous action, feeling, or communication, usually to avoid disapproval by others, feelings of shame, or losing control of one's impulses.	Depressants: inhibit emotional experience. Narcotics: cannot inhibit, have poor impulse control.
	Insufficient Self-Control	ISC	Pervasive difficulty or refusal to exercise sufficient self-control and frustration tolerance to achieve one's personal goals or to restrain the excessive expression of one's emotions and impulses.	Narcotics: poor impulse control, higher antisocial tendencies.

Footnote: 1) Variable descriptions for the MMPI-2 were taken from Hathaway & Mickley (1989). 2) Variable descriptions for the PAI were taken from Morey (1991). 3) Variable descriptions for the Young Schema Questionnaire were taken from Young, Klosko, & Weishaar (2003).

3

Appendix C: Drug-of-Choice Algorithm

STEPS TO ASSESS DRUG OF CHOICE

Information required:

1. Self-reported drug of choice as determined by MD on History and Physical
2. Diagnoses given by treatment team (Clinical Director & MD)
3. History of use as determined on History and Physical
4. Drug Screen: **Be aware that alcohol will likely NOT be positive on a drug screen, as it can be cleared from an individual's system within 24 hours. Therefore, in conditions concerning alcohol, this items needs to be interpreted as such. Also, marijuana stays in an individual's system for up to 30 days after use, whereas opiates and benzodiazepines have a much shorter half-life in the body. Take this into account as individuals will stay positive for THC longer than other drugs. Also, beware if an individual is going through medical detoxification or withdrawing that there is a chance they are given benzodiazepines to control symptoms (keep an eye out for DSM 292.xx codes for withdrawals in diagnoses and/or detoxification conditions).
5. Clinical Variables:
    a. PAI drug
    b. PAI alcohol
    c. ASI drug
    d. ASI alcohol
    e. SASSI FVA
    f. SASSI FVOD
6. Drug amount used as reported in History and Physical: *** If you have to reach this step in decision-making, please note so in your database.

Rate the following:

1. Note the "substance of choice"
2. Categorize into the following 6 conditions based on (1):
    a. 1= Depressants (Alcohol, Benzodiazepines, Barbiturates)
    b. 2 = Opiates, Narcotics, and Analgesics
    c. 3 = Stimulants (Meth, Speed, Cocaine, Crack, etc.)
    d. 4 = Marijuana
    e. 5 = Cannot Determine DOC due to complex poly-substance dependence or "other" drug that does not fit into a category.
        i. This condition is reserved for individuals who are heavy poly-drug users that do not have a distinguishable preference for one drug over another.
        ii. Also, individuals that claim no DOC and have no diagnosis fit into this category (such as on 3-5 day evaluations).

iii. Occasionally, individuals claiming “sex addiction” or “gambling addiction”, but no substance, fall into this category. If this is the case, please make note.

f. 6 = Not enough information to determine DOC.
   i. This condition is reserved for individuals missing vital information (e.g. H & P, diagnosis, drug screen) that make determining a DOC impossible. When this condition is used, please notate which information is missing.

PROCEDURE FOR RATER TO FOLLOW:

As per "steps" described (in detail) previously:

1 = Self-reported DOC in History and Physical

2 = Diagnosis given by treatment team

3 = Self-reported use in History and Physical

4 = Drug Screen

5 = Clinical Variables

6 = Amount of use reported in initial assessment

Condition A:

If 1 = X and 2 = X, then DOC = X

Condition B:

If 1 = X and 2 = Polysubstance, then

a. Review 3. If 3 is positive for X, then DOC = X.
b. If 3 is negative for X, review 4. If 4 is positive for X, then DOC = X.
c. If 3 & 4 are negative for X, but both positive for Y, then DOC = Y
    a. Under this condition, corroborate information by reviewing 5 and 6 (a-f). If one of the variables (a-f) is clinically significant, then DOC = Y.
d. If 1 & 3 & 4 are both positive for multiple substances, review information from 6. Determine DOC by reviewing amount of drugs used per patient report. If severity of use is indistinguishable between drugs, then no DOC can be reported.

Condition C:

If 1 = X, Y., and 2 = X, then DOC = X

If 1 = X, Y, and 2 = Y, then DOC = Y

If 1 = X, Y, Z, and 2 = X only, then DOC = X (this is for all cases where information from 1 contains multiple drugs with only one diagnosis given. If the individual does not have a diagnosis for these drugs it is likely they were used recreationally or abused, and the individual's dependence on a substance falls more into one specific category as determined by treatment team throughout that individual's course of treatment)

If 1 = X, Y, and 2 = X *dependence* and Y *abuse*, then DOC = X

If 1 = X, Y, and 2 = X *abuse* and Y *dependence*, then DOC = Y

Condition D:

If 1 = X, Y, and 2 = X, Y, then:

a. Review 3. If 3 is only positive for one (X or Y), then the substance 3 is positive for becomes that individual's DOC.
    a. IF 3 is positive for both X and Y, but has a "2" instead of a "1" for either X or Y, then defer to the drug that has a "1" on History and Physical. This is likely a situation where a patient received a diagnosis of drug dependence based on history (and is not currently "choosing" this drug).
b. If 3 is positive for both X and Y, review 4. If only one of these substances is positive on 4, then that substance becomes the individual's DOC.
    a. HOWEVER if either X or Y is reported as **alcohol**, it is likely that this will not show on 4 (drug screen). Therefore, skip to 5 and/or 6. Compare the drug and alcohol variables (a-f) for clinical significance.
    b. If both substances on 4 are positive for X and Y, then record both drugs as DOC and note that in the database, so we can look at #6.
        i. These individuals will be flagged and looked back into their H & P/Drug Screen to review levels of the drug in their system and amount of use. If one substance is substantially higher than the other (respectively), that that substance becomes the individuals DOC. Otherwise, it is inconclusive.

Condition E:

If 1 = X, 2 = Y, and 3 = Y (not X), then DOC = Y

If 1 = X, 2 = Y, and 3 is positive for X and Y (or polysubstance), then:

a. Review 4. If 4 is positive for one of X or Y, then that substance would become DOC.
    a. If either X or Y is **alcohol**, skip 4 and move to 5. Compare the drug and alcohol variables (a-f) for clinical significance. If more variables relating to alcohol are significant, then that becomes the individual's DOC (and vice-versa). If all variables are clinically significant, then no drug of choice can be determined.
        i. If no discernment can be made from this information, move to information from #6 and flag this in the database.
b. Review information from 6. Determine DOC by reviewing amount of drugs used per patient report. If severity of use is indistinguishable between drugs, then no DOC can be reported.

c. If no DOC can be determined, and X and Y are both substances that fall in the same group (e.g. CNS depressants such as alcohol and a benzodiazepine), then the individual can still be grouped for the study, with no determined DOC.

Condition F:

If 1 = X, 2 = Y, but 3 and 4 = X (not Y), then DOC = x

If 1 = X and 2 = Y, review 3.

a. If 3 is positive for X (not Y), then DOC = X.
b. If 3 is positive for both X and Y, view 4.
c. If 4 is positive for one of X or Y, then DOC is that substance.
    a. However, in the case of alcohol being X, move on to 5. If more variables relating to alcohol are significant, then that becomes the individual's DOC (and vice-versa). If all variables are clinically significant, then no drug of choice can be determined.
    b. If no DOC can be determined, and X and Y are both substances that fall in the same group (e.g. CNS depressants), then the individual can still be grouped for the study, with no determined DOC.

Condition G:

If 1 = X, Y, AND 2 = X,Y,

AND

Both 3 and 4 are positive for X and Y

THEN

Review information from 6. Determine DOC by reviewing amount of drugs used per patient report. If severity of use is indistinguishable between drugs, then no DOC can be reported.

Condition H:

If 1 = X, X, and Y (e.g. multiple substances within same use category, such as two different types of opiates) AND 2 = X, then DOC = X

If 1 = X, X, and Y, and 2 = Polysubstance, then DOC = X

If 1 = X, X, and Y, and 2 = X, Y, then review 3. If 3 is positive for only X, then DOC = X.

a. If 3 is positive for X and Y, review 4
b. If 4 is positive for X and Y (minus situations when alcohol/marijuana are involved), skip to 5/6 and follow the same procedure of flagging this in your database.
c. If 4 is positive for only one of X or Y (minus alcohol/marijuana), then that becomes the individual's DOC.

Appendix D: Variable Definitions of 11 Predictors Associated with Significant Function from Discriminant Function Analysis

Measure	Variable	Code	Description
MMPI-2[4]	Antisocial Practices	ASP	High scorers report problem behaviors during their adolescence such as stealing, shoplifting, and being in trouble with the law. They report sometimes enjoying the antics of criminals, and if not explicitly endorsing unlawful conduct, they believe it is all right to get around the law.
	Naivete	Pa3	High scorers are presenting very unrealistically optimistic attitudes about other people. They present themselves as trusting, having high moral standards, and not having hostile or negative impulses.
	Amorality	Ma1	High scorers see other people as selfish, dishonest, and opportunistic, and because of these perceptions feel justified in behaving in similar ways. They may derive vicarious satisfaction from the manipulative exploitation of others.
	Cynicism	CYN	Misanthropic beliefs characterize high scorers. They expect hidden, negative motives behind the acts of others. Other people are to be distrusted. They likely hold negative attitudes towards those close to them, including family/friends/coworkers.
	Need for Affection	Hy2	High scorers have strong needs for attention and affection from others, as well as fears that these needs will not be met if they are honest about their feelings and beliefs. They present themselves as seeing others as honest, sensitive, and reasonable, and deny having negative feelings about others.
	Poignancy	Pa2	High scorers indicate that they are more high strung and sensitive than others. They feel lonely and misunderstood, and may seek out risk or exciting activities to feel better.
	Physical Malfunctioning	D3	High scorers are likely preoccupied with their own physical functioning. They deny good health and may report a wide variety of specific somatic symptoms.
PAI[5]	Depression	DEP	High scorers report a range of symptoms associated with depression, such as negative expectancies, helplessness, and cognitive errors, often report unhappiness, dysphoria, and apathy, and vegetative/somatic features of depression (e.g. disturbances in sleep, appetite, and sexual drive).

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Antisocial Features	ANT	High scorers are egocentric, narcissistic, tend to seek thrills and excitement, have a low boredom tolerance, and have conduct problems often associated with the antisocial personality.
Paranoia	PAR	High scorers are hypervigilant—prepared, sensitive, and wary in interactions with others. They also hold bitter and envious feelings towards others, along with a sense of being treated unfairly by others. In extremes, they also can feel persecuted by others, sometimes at a delusional level.
Somatic Complaints	SOM	High scorers can have dramatic physiological symptoms similar to those found in conversion disorders, report more routine physical complaints at a higher frequency, and are preoccupied with their health and physical functioning.

*Note, variable descriptions adopted from Hathaway & McKinley (1989) and Morey (1991).

Appendix E: Details of Cases Categorized as Indeterminate

1. #35: Diagnosed with Opiate & Marijuana Dependence, also Sedative/Hypnotic/Anxiolytic Abuse. UDS positive for Marijuana only. In stating drug use levels, patient reports Marijuana as drug of choice, but also regularly using hydrocodone, xanax, and alcohol. Assessments indicate patient's primary issue is with drugs (over alcohol).

2. #47: Abusing alcohol since age 17, daily Marijuana use since age 12. Can drink 1/5 of liquor without much effect. Also experimenting with opiates, ecstasy, LSD in the past year. Diagnosed with Polysubstance Dependence and Bipolar Disorder. Assessments do not significantly discriminate between each other. UDS is clean.

3. #75: Patient reports using 4mg of xanax nightly, 60 mg of roxicodone (nasally) daily, $50 worth of crack cocaine daily, 1mg of marijuana daily, and takes 2 klonopin daily. Diagnosed with Polysubstance Dependence. UDS positive for Marijuana. Assessments indicate patient's primary problem is with drugs, but patient reports no drug preference.

4. #88: Patient diagnosed with Marijuana and Sedative/Hypnotic/Anxiolytic Dependence. Patient vehemently denies any drug abuse or dependence. No History and Physical. Assessments all in non-clinical range. UDS clean.

5. #95: Patient reports using hydrocodone and soma on a daily basis, as well as occasional abuse of diet pills. Patient diagnosed with both Opiate and Sedative/Hypnotic/Anxiolytic Dependence. UDS clean. Assessments indicate patient's primary problem is with drugs, although patient does not state a drug preference.

6. #138: Patient diagnosed with Polysubstance Dependence. Patient reports using 5-6mg of xanax daily, 6mg of heroin or morphine daily, and 4mg of crystal meth daily. UDS positive for Marijuana only. Assessments identify drug use as the issue, but cannot distinguish which drug is primary preference.

7. #205: Patient diagnosed with Polysubstance Dependence. UDS clean. Patient admits to using alcohol, benzodiazepines, opiates, cocaine, and marijuana on a regular basis. Assessments do not clarify any information.

8. #256: Patient reports drug of choice to be alcohol and speed. Patient diagnosed with Alcohol, Amphetamine, and Marijuana Dependence. UDS positive for Marijuana and Amphetamines. Patient has a prescription for Adderall. Patient reports a history of Marijuana dependence. Assessments do not clarify any information.

9. #258: Patient reports his drug of choice as Dextromethophan (DXM—cough suppressant). Patient diagnosed with Alcohol Dependence, Opiate Abuse, and Sedative/Hypnotic/Anxiolytic Abuse. UDS clean. Assessments do not clarify any information.

10. #315: Patient reports seeking treatment for "sexual addiction". Patient has a history of Alcohol and Marijuana Dependence, but has been sober for 9 years, and is seeking treatment for a behavioral addiction.

11. #317: Patient drinks 1/5 of vodka daily (past 3 months). Patient also takes 16mg of suboxone daily, 60 mg of oxycontin and 20 mg of oxycodone daily. Patient admits to

both alcohol and opiate dependence, and is diagnosed with both. Assessments indicate a clinical problem with both alcohol and drugs. UDS positive for benzodiazepines.

Vita

Lindsey Kate Colman was born in Baisingstoke, England, to the parents of Janet Wallace and Stuart Colman. She is the middle of three children, between Nick and Rosemary Colman, and has three step-siblings: Megan, Andrew, and Marion Wallace. She attended Dunnannie and Dunhurst schools in Petersfield, Hampshire, England, and then immigrated with her family to Nashville, TN at the age of 11. Lindsey stayed in Franklin and graduated from Centennial High School in 2003. Attending the University of Tennessee on full scholarship, Lindsey became interested in Psychology in her Sophomore year of college. She began to work as a Program Counselor at a treatment center, immediately felt a connection with the work, and decided to pursue graduate school and a career in Clinical Psychology. Highly motivated, Lindsey graduated from the University of Tennessee in three years and was accepted directly into the doctoral program in Clinical Psychology at the University of Tennessee. Lindsey graduated with a Master of Arts degree in Psychology in May of 2010. She is continuing to pursue her doctorate at the University of Tennessee, and plans to graduate with a Doctor of Philosophy in May of 2012.