

THE EFFECTIVENESS OF SUBSTANCE USE MEASURES IN THE DETECTION OF
DENIAL AND PARTIAL DENIAL

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Thesis Prepared for the Degree of
MASTER OF SCIENCE

UNIVERSITY OF NORTH TEXAS

May 2011

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Wooley, Chelsea N., The effectiveness of substance use measures in the detection of denial and partial denial. Master of Science (Psychology), May 2011, 113 pp., 13 tables, 1 figure, references, 138 titles.

Many substance users deny their substance use to avoid negative consequences, thus diluting the accuracy of assessment. To address this issue, indirect items are often included on substance use measures to identify those who deny their use. The purpose of this study was to examine the effect of complete denial and partial denial on substance use measures. Partial denial, also termed denial of effects, is the denial of substance use interfering in multiple domains of a person's functioning. The study used a mixed within- and between-subjects design with participants from a dual diagnosis inpatient unit. Each participant completed the study under two different conditions which include an honest condition and an experimental condition (either complete denial or partial denial). Results show that partial denial is distinctly different from complete denial across three self-report substance use measures. Importantly, substance users engaging in these denial conditions were often undetected by these measures.

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CHAPTER 1

INTRODUCTION

In 2007, an estimated 22.3 million people were classified with substance abuse or dependence (U.S. Department of Health and Human Services [HHS], 2008a). Of these, only 3.9 million people received treatment leaving approximately 83% of substance users without clinical services for their addictions. Drug use takes an economic toll on the U.S. costing nearly \$180.9 billion in 2007 (HHS, 2008a). Besides treatment of substance use, these costs also include other illnesses that are a direct consequence of drug use, including needle borne illnesses such as HIV and hepatitis. For example, the Centers for Disease Control and Prevention (HHS; 2008b) reported in 2006 that 244,889 adults living with AIDS in the U.S. contracted the disease from injection drug use.

Employers have become more concerned with employees using drugs. In 2007, it was estimated that 13.1 million current drug users were employed either full or part time basis (HHS, 2008a). Companies have become more vigilant to avoid hiring drug users due to the economic burdens they place on employers. These burdens include above average rates of absenteeism, involuntary turnovers, and negative job behaviors which increase costs (Normand, Salyards, & Mahoney, 1990; Stein, Smith, Guy, & Bentler, 1993). As evidence of its far-reaching effects, Pollack, Franklin, Fulton-Kehoe, and Chowdhury (1998) found that drug using employees had a statistically significant higher risk of a work-related injury than non-users. For example, construction workers have a higher risk of work-related injuries as well as much higher rates of drug use than other occupations, indicating that drug use makes dangerous jobs even more dangerous (HHS, 2008a). In addition, members of certain professions could potentially harm many people even at low levels of impairment. Examples include airline pilots, bus drivers, and

air traffic controllers. To address the increasing drug use, companies have initiated drug testing for their workers and over 90% of American companies conduct some form of drug testing of their employees (DeLancey, 1994).

Drug use is also an important issue to address in clinical and medical settings. Illicit drug use leads to approximately 20,000 deaths each year in the United States (McGinnis & Foege, 1993). Many deaths are caused directly by overdose, suicide, homicide, and motor vehicle accident injuries; other deaths are indirect, such as pneumonia, hepatitis, and HIV disease. Drug users are at higher risk for acquiring and transmitting HIV via needle sharing, trading sex for drugs, and unprotected sexual relations (Stein, 1999). Injection-drug addicts have been found to die at seven times greater rate when compared to similar age groups in the general population (Joe & Simpson, 1987). Similarly, opioid addicts die at a rate of 6.9 times greater than the general population; of these deaths, 29% were due to violence and 48% were due to drugs (Joe & Simpson, 1987).

The jail and prison system has also been affected by the increase of drug use in the United States. The federal and state prison populations have increased rapidly primarily due to the influx of inmates incarcerated for drug-related offenses (U.S. Department of Justice [DOJ], 2005). In 2002, 68% of jail inmates were found to have substance abuse or dependence diagnoses, although Peters, Greenbaum, Edens, Carter, and Ortiz (1998) reviewed previous studies and found rates of substance abuse or dependence fluctuate widely from 28% to 91%. Furthermore, the DOJ (2005) found that jail inmates who met criteria for substance abuse or dependence were more likely than other inmates to have a past criminal record and have been homeless in the year before their current offense. Half of convicted inmates were under the

influence of drugs of alcohol at the time of the offense and 16% of convicted jail inmates said they committed their offense to obtain money for drugs.

Response Styles for Substance Use

Despite the increased prevalence of drug use, there remain social and criminal sanctions that often accompany drug users, such as social stigma and criminal charges. These sanctions may cause substance users to misreport their drug use which can often distort clinical and forensic assessments. Response styles of drug users are especially salient because substance users are often referred to treatment based on patients' self-reports (McElrath, 1994).

Before examining the substance use research, it is essential to operationalize terms related to response styles. Stein and Rogers (2008) explain specific terminology for response styles related to substance abuse:

1. *Disacknowledgement*: Disacknowledgement characterizes the response style in which the persons claim to not know the amount, type, or consequences of their drug use. It is unclear whether these persons are being honest in their disacknowledgements.
2. *Misappraisal*: Those who misappraise their drug use, unintentionally report incorrect substance use information. These persons believe their reports to be honest but are unaware of their inaccuracies. Misappraisals, much less common than denial, can occur in various situations due to poor memory or adulterated substances.
3. *Denial*: Denial occurs when the type, amount, impairment, or effects of substance use are intentionally minimized or unacknowledged. Denial is the commonly-accepted term in substance use for what is described as "defensiveness" in other

mental health settings. A common hurdle when working with a substance use population, denial can occur due to social desirability, avoiding treatment, avoiding criminal sanctions, or unwillingness to accept responsibility for behavior. Denial is an especially significant consideration in medical settings where denial of substance use could result in adverse drug reactions or misdiagnoses (Rockett, Putnam, Jia, & Smith, 2003). Previous studies, described below, focus on the denial of the amount or type of substances; researchers have yet to investigate the denial of impairment or the negative consequences of drug use (e.g., getting fired or criminal sanctions).

4. *Exaggeration:* Exaggeration is a response style in which persons deliberately magnify their substance use or its effects. For example, adolescents may intentionally magnify their substance use to better “fit in” with their peers or to enhance an image of rebelliousness (Palmer, Dwyer, & Semmer, 1994). When considering an arrestee population, offenders may over-report or fabricate drug use as a mitigating factor in the trial process (Rogers & Mitchell, 1991).

Psychological assessments are further complicated when these response styles are employed. Denial is the most common response styles in substance use populations, which adds an additional challenge to psychologists to obtain an accurate account of substance use.

Denial of Substance Use

The prevalence for the denial of substance use has not been well established (Stein & Rogers, 2008). As reviewed by Hser, Maglione, and Boyle (1999), previous studies have found a wide range of denial among substance users; between 25% and 72% of participants who denied recent use of drugs had a positive urine test.

Certain variables have been identified to affect the rates of denial. The following subsections explore these variables across samples, such as community, clinical, and forensic.

Settings

Psychologists should take special note to the setting in which they are assessing. To obtain a more accurate account of substance use, the substance user should feel comfortable to discuss their drug use and not fear sanctions for admitting to such behavior (Kosten, Gawin, & Schumann, 1988). Therefore, certain settings may provoke this fear more than others. As reviewed by McElrath (1994), studies of community samples often provide more accurate reports of their drug use than those from other settings. Participants from the community do not typically fear legal consequences for anonymously revealing their drug use, especially for research purposes. Encouragingly, Dowling-Guyer et al. (1994) found approximately 80% agreement between self-reports and urinalysis results for cocaine, heroin, and other opiates using paid research participants in the community. However, this level of agreement is likely inflated due to a design flaw. Specifically, the participants were forewarned that their self-reports would be compared to their urinalysis. Therefore, participants were likely to be forthcoming knowing their self-report would be compared to an objective measure.

When considering a forensic population, Rogers and Mitchell (1991) concluded that the accurate assessment of substance abuse among offenders is often confounded by the offenders' denial or minimization of their drug use. On this point, Hser et al. (1999) compared the prevalence of underreporting between arrested and community samples. Hser and his colleagues found that those arrested had higher rates of drug use but unexpectedly lower rates of underreporting than their community counterparts. However, the arrestee sample had already provided a urine specimen before questioning. Therefore, their lower rates of underreporting

were likely influenced by biological evidence of their drug use. In contrast, those in the community setting were offered an opportunity to refuse the urine specimen after questioning. As a result, 26.4% of the community sample did not give a urine sample and were not included in the comparisons. Furthermore, Hser et al. (1999) suggested that those in the community groups may fear social stigma more than those in the arrestee sample. In contrast, the arrestee sample may already feel stigmatized due to their arrest and drug use may be perceived as a minor issue relative to their criminal history. Arrestees may also be motivated to report drug use in hope of receiving treatment rather than further incarceration.

Type of Drugs

As a further complication of substance use assessment, the amount of disclosure may directly be related to the type of drug used. For example cocaine and opiates are the most frequently underreported drug in community settings, while marijuana is frequently the least underreported drug (Ledgerwood, Goldberger, Risk, Lewis, & Price, 2008; Mieczkowski, Barzelay, Gropper, & Wish, 1991; Rosay, Najaka, & Herz, 2007). Messina, Wish, Nemes, and Wraight (2000) found nearly one-fourth of community participants with a drug use treatment history denied cocaine use but produced cocaine-positive urinalysis. Furthermore, McNagny and Parker (1992) found that 72% of people with cocaine-positive urine denied recent cocaine use in a sample of adults using a walk-in clinic. In contrast, Ledgerwood et al. (2008) found no denial of recent marijuana use in a community of middle-aged men. In fact, several studies (Harrell, 1997; Harrison, 1997; Hser et al., 1999; Magura, Goldsmith, Casriel, Goldstein, & Lipton, 1987) have found that underreporting varies as a function of each drug's stigmatization. For example, opiate use is often penalized more severely than abuse of other drugs in methadone treatment clinics and is the most underreported drug in this setting (Magura et al., 1987).

Sanctions for marijuana are mild compared to other drugs, which possibly explains the relatively low rate of underreporting of marijuana. For instance, Hser et al. (1999) found that recent marijuana use was the least denied substance among samples drawn from sexually transmitted disease clinics, emergency rooms, and jail; nonetheless, the denial rate of marijuana ranged from 31.3% to 40.2% in these settings.

McElrath (1994) conducted a similar study with offender samples to investigate whether this trend was consistent across samples. Contrary to expectations, he found that cocaine had lower underreporting rates than heroin or marijuana. However, this study looked only at agreements between self-reports and face-to-face interviews, both relying on the inmates' being forthcoming in their reports of drug use. No urinalysis was used to verify these results; therefore, the study investigated only the level of consistency among inmates between two information gathering methods, rather than independently verified rates of denial.

Prior Treatment History

Treatment history often affects how forthcoming substance users are in their reporting of drug use. Studies of underreporting in treated drug users may not be generalizable to their untreated counterparts (Nelson et al., 1998). Knight, Hiller, Simpson, and Broome (1998) examined offenders' self reports of cocaine use with hair and urine tests. They compared the rates of underreporting of those with and without prior substance use treatment. While no group was entirely forthcoming, offenders who had received substance use treatment were more forthcoming than those with no treatment history. Similarly, Gray and Wish (1999) found that female arrestees with prior treatment were more likely to report recent drug use than their untreated counterparts. Among a clinical sample, Greenfield, Bigelow, and Brooner (1995) found that only 5% of participants entering a treatment program denied substance use that was

disconfirmed by urinalysis. When contacted six months after treatment, those denying substance use with a positive urine specimen jumped to almost 20%. Furthermore, the consequences of revealing drug use may change as treatment processes continues (e.g., seen as a treatment failure).

Newer drug users, many who have never been in treatment, are more likely to deny their drug use than their more experienced counterparts (Gray & Wish, 1999). Patients entering treatment are more forthcoming with their drug use than those who have been in treatment for a longer period of time (Sherman & Bigelow, 1992). Gray and Wish (1999) concluded that those who have been through treatment often have had to confront their substance use, break down their denial, and accept and admit their drug use. Therefore, people with prior treatment history may no longer feel the need to deny their substance use.

Collaborative Sources

To address the underreporting, collaborative sources are sometimes used to obtain a more accurate picture of the substance use, although generally they are often difficult to find and may not contribute accurate information. As an illustration, Belkin and Miller (1992) assessed a small sample of 18 inpatients on an alcohol and drug unit. Using blood and urine specimens as the objective criterion, they compared the patients' self-report and collaborative sources to try to gain a more accurate substance use diagnoses. Interestingly, they found that family informants were not generally useful for diagnosing substance dependence, indicating that drug users often succeed in misleading them about their drug use (Harris, Griffin, McCaffrey, & Morral, 2008).

Adolescents

Considering substance use while assessing adolescents has become a salient issue for psychologists. When evaluating adolescents who use drugs, there are several variables specific to

adolescents to consider. For example, adolescents are more affected by the attitudes of their friends; therefore, perceived social stigma and social desirability effects play an important role in the accuracy of substance use reported by adolescents (Harris et al., 2008). Adolescents are more willing to disclose their drug use in school-based settings than at home. At school, adolescents feel more pressure from their peers which affects their amount of disclosure (Gfroerer, Wright, & Kopsten, 1997). Another aspect of adolescent substance use includes the approval of authority figures influence adolescents' disclosure. Adolescents who seek approval from authority figures may alter their responses to be accepted by them. Due to these concerns, Williams and Nowatzki (2005) report that overall adolescents' self-report of substance use has only "fair" validity.

These assessments are further complicated by the sophistication of the measures used to assess for drug use. Adolescents are less likely to recognize the chemical or official names of drugs listed on assessment instruments (Harris et al., 2008). Instead, adolescents may only know the street names or slang terms of the drugs instead of their chemical names (Johnston & O'Malley, 1997; Morral McCaffey, & Chien, 2003). Psychologists should consider the complexity of substance use measures when assessing adolescent substance use. However, adolescents show increasing sophistication with substance use terms with increased drug experience.

Adolescent self-reports range in accuracy depending on the type of drug as well as the time frame that the drugs were taken. Fendrich and Xu (1994) assessed 3,086 male juvenile arrestees that ranged in ages from 9 to 20 and compared their self-reports to urine specimens. According to lab results, adolescent arrestees were reluctant to disclose their most recent (i.e., 72-hour interval) use of illicit substances except for marijuana. One striking finding was that most adolescent arrestees that were positive for cocaine or heroin denied their drug use: 84% of

cocaine-positive and 95% of heroin-positive adolescent arrestees denied cocaine use. Moreover, Harris et al. (2008) found that adolescents who had characteristics related to high levels of drug involvement (intensity and duration) were more inconsistent in their responses; Specifically, the level of drug involvement was measured by characteristics such as use of hard drugs, early initiation of drugs, criminal justice involvement, and substance use treatment history.

When directly comparing adolescents to adults, adolescents parallel adults across several aspects of substance use. Yacoubian, VanderWall, Johnson, Urbach, and Peters (2003) discovered that marijuana and cocaine were the most prevalent drugs used by both adults and adolescents. Yacoubian and colleagues also found similar prevalence rates of cocaine use among adults and adolescents (10% and 13% respectively). However, one main difference is that adolescents are overall more willing to disclose their recent drug-use (Yacoubian et al., 2003). Adults underreported their recent use of marijuana, cocaine, and PCP more than juvenile arrestees, but the opposite was found for heroin use. The authors noted three hypotheses to explain this difference. First, the adult offenders may be more affected by memory loss due to their extensive drug use and may be misappraising their drug use. Second, the adult offenders have likely denied their drug use for a longer period of time and denial is “second-nature” to them. Third, adolescent offenders may be more fearful of consequences if they are caught denying their drug use.

Objective Detection Methods for Substance Use

Due to the high prevalence of underreporting, a biological specimen is often collected to provide an objective measure of recent drug use in medical settings (Yacoubian et al., 2003). Most of the studies discussed above compared a biological specimen to a self-report to determine whether participants are denying their substance use. For this purpose, urine and hair analyses

are the most commonly used biological tests to detect drug use. Urinalyses have been shown to provide reliable results (Dolan, Rouen, & Kimber, 2004); but can only detect drugs used one to seven days before the test. Hair analyses can detect drug use months before the analysis and can show changes in drug use but cannot detect drug use the week before the test. Urinalyses can be adulterated and require direct supervision to ensure reliability. Requiring direct supervision to collect urine specimens can be time consuming and a degrading process for those involved (Bennett, Davies, & Thomas, 2003). Hair analyses can also be adulterated by cutting or bleaching the hair before the sample is collected. The detectability of urinalyses depends on many different factors, such as the type of drug, amount of drug ingested, frequency of use, route of administration, and the sensitivity of the method used to test the sample (Buchan, Dennis, Tims & Diamond, 1997), but only detects the presence of a substance. Therefore, testing negative for substances on a urinalysis does not ensure that the patient did not ingest that drug. Even though urine and hair analyses are not foolproof, they are often used as an objective measurement of substance use because they have shown to be more reliable than other forms of measurement, particularly in samples where underreporting is prevalent. Some of the more recent advances in substance use detection include testing saliva and sweat. These types of tests are currently being examined for their usefulness and practicality.

Rather than using biological specimens, physicians continue to rely mainly on reported history even though they are aware that patients are inconsistent and often underreport drug use (Belkin & Miller, 1992). Psychiatrists and psychologists do not often have access to laboratories or the financial resources to conduct these types of analyses. Furthermore, psychological training has promoted the use of psychological measures to assess for substance use. The following sections discuss these types of measures and their impact on substance use assessment.

Measuring Substance Use through Self-Report and Multi-Scale Inventories

Due to their training, psychologists often rely upon self-report measures, structured interviews, and multi-scale inventories to assess for substance use. These standardized methods are used because they have been proven to be reliable and valid measures of acknowledged substance use. Multi-scale inventories are often used because they assess for a wide variety of psychopathology and are time efficient. Individual scales on these measures are relied upon to assess specifically for substance use. They often consist of subtle items to assess substance use in an attempt to detect substance users who are underreporting their drug use. The next sections address how two specific multi-scale inventories (i.e., MMPI/MMPI-2 and MCMI) assess substance use.

Minnesota Multiphasic Personality Inventory

One of the earlier attempts to use subtle items was the Minnesota Multiphasic Personality Inventory (MMPI; Lentz, 1943). The MMPI used empirical keying in which items were included, irrespective of their content, that discriminated between normal and psychiatric groups. Empirical keying led to the inclusion of subtle items whose content is not obvious to the respondent but statistically distinguished those with and without psychopathology. However, researchers (Gottesman & Prescott, 1989) have questioned the validity of the subtle items on the MMPI that specifically address substance use, such as the MacAndrews or Addiction Potential scale.

The MMPI includes a MacAndrews (MAC) scale used to detect substance use. While the MAC scale was originally developed to identify alcoholics, later studies showed that the scale had potential with drug users (Kranitz, 1972). The MAC scale was originally created via empirically keying to assess the potential for addiction. Almost completely composed of subtle

items, the MAC includes only two items that ask directly about substance use. Four items were subsequently deleted on the MAC scale in the development of the MMPI-2 due to their religious content, sexist bias, or overt substance use content (Greene, 2000). The MacAndrews Revised Scale (MAC-R) scale items differentiated male substance users from male psychiatric patients. While using subtle items is one method to detect substance users who are underreporting, researchers (Weed, Butcher, McKenna, & Ben-Porath, 1992) debate whether subtle items on substance use scales are actually assessing for personality traits that are associated with, but not exclusive to substance users.

The MAC scale has been shown to assess general lifestyle characteristics of substance abusers (Weed et al., 1992). According to Schwartz and Graham (1979), the MAC has six factors associated with personality and deficits (i.e., cognitive impairment, social maladjustment, interpersonal competence, risk taking, extroversion and exhibition, and moral indignation), indicating that the MAC scale may possess items that are common among those with antisocial personality traits. Accordingly, several studies have explored the relationship between the MAC scale and antisocial personality traits. Preng and Clopton (1986) found patients with antisocial personality disorder (APD) possess similar characteristics to those with high MAC scale scores. Furthermore, Wolf, Schubert, Patterson, Grande, and Pendeton (1990) concluded that antisocial personality diagnoses concurrent with alcoholism and drug use influence MAC scores. Overall, empirical research has shown that the MAC scale appears to detect personality types, such as APD (Rouse, Butcher, & Miller, 1999; Preng & Clopton, 1986; Wolf, et al., 1990). Therefore, persons with APD may be misclassified as substance dependent. Thus, caution must be taken when interpreting the MAC scale in populations where APD may be more prevalent, such as criminal settings.

Two new scales on the MMPI-2, the Addiction Potential Scale (APS) and the Addiction Acknowledgement Scale (AAS), were created to better discriminate between substance use, nonclinical, and psychiatric samples better than the MAC-R (Weed et al., 1992; Greene, Weed, Butcher, Arredondo, & Davis, 1992). While the APS was created via empirical keying, the AAS was created based on the items' obvious content related to substance use and was designed to assess the extent to which an individual acknowledged abusing alcohol or drugs (Rouse et al., 1999). Similar to the MAC and MAC-R, the APS identifies personality characteristics and lifestyle patterns associated with alcohol and drug abuse (Weed et al., 1992). Five factors have been found in the APS, which include satisfaction/dissatisfaction, powerlessness/lack of self-efficacy, antisocial acting-out, surgency, and risk-taking/recklessness (Sawrie et al., 1996). The last three factors of the APS are similar to the MAC-R factors found by Weed and his colleagues (1992). The first two factors are related to psychological distress rather than substance use (Sawrie et al., 1996). None of the factors included substance use.

Due to its transparency, the AAS is susceptible to a defensive test-taking approach and has not been examined in populations where denial would be more prevalent (i.e., occupational or forensic settings). The scored response for 75% of the items on the AAS is "true;" therefore, a tendency toward a "false" response (nay-saying) set result in low AAS scores (Greene, 2000). However, Rouse et al. (1999) found that the AAS was a better predictor of substance use than the APS or MAC-R for outpatients. Therefore, high scores on the AAS may suggest the possibility of substance abuse difficulties, but low scores are not indicative of the absence of substance abuse problems (Stein et al., 1999). When examining the MAC-R and APS scales in a college population, the MAC-R scale had no relationship to those with a substance dependence disorder and the APS was found to only have a weak relationship (Svanum, McGrew, & Ehrmann, 1994).

This finding is expected since the university population is less likely to have antisocial characteristics, such as acting-out, recklessness, and impulsivity, which have been associated with high MAC-R and APS scale scores. Overall, research has shown that the items on the MAC-R and APS scales appear to measure antisocial characteristics rather than substance use.

Millon Clinical Multiaxial Inventory

The Millon Clinical Multiaxial Inventory (MCMI-III; Millon, Davis, & Millon, 1997) is a clinical measure often used to assess for personality pathology and psychopathology. The MCMI-III includes a Drug Dependence scale that includes both “prototypical” or direct items and “nonprototypical” or subtle items. The MCMI-III manual states that including subtle items on the Drug Dependence scale may be useful in identifying those who are not willing to admit drug problems (Millon, et al., 1997). The inclusion of subtle items is assumed to be less susceptible to faking good than more face valid items. However, 100% of the subtle items on the Drug Dependence scale can also be found on the Antisocial Scale as either a direct or subtle item, demonstrating the strong reliance on antisocial characteristics to detect substance use. Since the subtle items on the Drug Dependence scale seem to be related to antisocial characteristics, those with APD will likely also be labeled as drug dependent.

The reliance on antisocial characteristics for subtle items creates problems when working in populations where APD is common. People in forensic settings are often impulsive and have difficulties following societal standards, which caused them to be in contact with the legal system. Therefore, giving these measures to antisocial populations likely misclassifies individuals in forensic settings as well as those in clinical or community settings.

Specialized Substance Use Measures

For greater precision, substance use assessment has moved toward using more specialized measures. Initially, specialized substance use measures relied upon face-valid questions that plainly ask the person of their drug use and do not try to disguise the purpose of the inquiry. The transparency problem occurs when drug users purposely deny substance use because the purpose of the question is obvious. These types of questions allow drug users to easily avoid detection.

Specialized substance use measures have evolved to address issues of underreporting among substance users. One such measure is the Substance Abuse Subtle Screening Inventory-3 (SASSI-3). The SASSI-3 is the most popular among substance use measures used in criminal and non-criminal settings (Miller & Lazowski, 1999). The SASSI-3 was innovative in this field because it was the first specialized substance use measure to include the use of subtle items to address underreporting of drug use.

The SASSI-3 has three face valid scales that ask directly about substance use and six subtle scales. The SASSI-3 includes two specific subtle scales that detect substance use even when denied: the Subtle Attributes (SAT) and Obvious Attributes (OAT). The SAT scale consists of questions developed through empirical keying that discriminated between substance dependent subjects and non dependent subjects *regardless* of whether they were responding under standard instructions or denial instructions asking them to conceal evidence of substance abuse (Lazowski, Miller, Boye, & Miller, 1998; Laux, Perera-Diltz, Smirnoff, & Salyers, 2005). Although the title of the scale suggests otherwise, the OAT scale is comprised of entirely subtle items that assess behavioral traits often associated with substance use that differentiated between substance dependent and non-dependent participants (Lazowski et al., 1998; Miller & Lazowski, 1999). The items on the OAT and SAT scales appear to be similar to the subtle items on the

MCMI-III Drug Dependence scale which uses items that assess antisocial behaviors as a way to detect for substance use.

While the SASSI-3 made great strides in substance use assessment, independent studies have not been able to achieve the same validity and reliability that the manual states (Feldstein & Miller, 2007). Furthermore, research has shown that the subtle scales may not accurately detect those who are underreporting their substance use. Gray (2001) found that the face valid scales on the SASSI exhibited the most reliability, while the indirect scales showed poor to fair reliability. He concluded that direct questions pertaining to specific symptoms yield better scores than an indirect approach. Similarly, Feldstein and Miller (2007) suggest that the indirect scales appear to be assessing global distress and social deviance. Other studies have found that the SASSI's indirect scales are highly correlated to the MAC-R (Cooper & Robinson, 1987). As previously noted, the MAC-R scale has shown to measure antisocial traits. Therefore, further research is necessary to investigate the relationship of antisocial traits and the indirect scales on the SASSI-3.

The concerns over the SASSI-3 are especially important due to the emphasis placed on its results. While Miller and Lazowski (1999) suggest that the SASSI-3 should be used as a screen for substance use, the SASSI-3 is often used as the sole determinant of substance use diagnoses. The SASSI-3 is also used to inform treatment decisions and correctional dispositions. In fact, the SASSI-3 has been used to override other self-reports and to help determine a client's degree of drug use and criminal involvement (Swartz, 1998).

Current Study

Denial among substance users continues to complicate substance use assessment. While the SASSI-3 attempted to address this issue, the current study focused on whether the SASSI-3

can detect those who are denying their substance use. The Drug Abuse Screening Test (DAST), a completely face valid measure, and Drug Use Screening Inventory-Revised (DUSI-R), a measure to assess the effects of drug use, were examined to determine if substance users can successfully deny their substance use without detection.

This study is the first to investigate a specific subtype of denial: denying the effects of substance use. The SASSI-3, DAST, and DUSI-R were investigated to determine if those engaging in this specific subtype of denial can avoid detection on these measures. Moreover, this study examined whether there is a difference between those instructed to completely deny their substance use and those asked to deny the effects of their substance use.

The indirect items on previous substance use measures have been found to be closely related to antisocial characteristics. One purpose of this study is to investigate whether those with APD elevate two of the subtle scales on the SASSI-3. This is a particularly important question due to situations where the SASSI-3 is the sole determinant for someone, specifically in a forensic setting where antisocial characteristics are more common.

Research Questions and Hypotheses

Research Question 1. Will substance users in the partial denial condition show significantly different scores than those in the complete denial condition?

Previous research has not examined specific subtypes of denial and whether specific subtypes of denial will significantly change the results of substance use measures. This question examines how those in the partial denial condition, who are asked to deny the effects of substance use, differ from those in the complete denial condition.

- Hypothesis 1: Substance users in the partial denial condition are significantly different than those in the complete denial condition on the SASSI-3, DAST, and DUSI-R.

Research Question 2. Can substance users effectively deny their substance use without detection?

Previous research has shown that those motivated to deny their substance use can do so easily on face valid measures. This question examines if those in the denial conditions can avoid detection on a completely face valid scale and measure. Moreover, the SASSI-3 has two subtle scales that were developed to detect substance use even if someone is motivated to deny it. These subtle scales were evaluated to determine if those instructed to deny their substance use can avoid detection.

- Hypothesis 2: Substance users in the complete and partial denial conditions have significantly lower scores on the DAST than those in the honest condition.
- Hypothesis 3: Compared to those in the honest condition, substance users in the complete and partial denial conditions have significantly fewer individuals who qualify for a substance dependence disorder as determined by scores from the SASSI-3.
- Hypothesis 4: Compared to those in the honest condition, substance users in the complete and partial denial conditions have significantly lower scores on the OAT, SAT, and FVOD scales on the SASSI-3.

Research Question 3. Are substance users with APD scoring higher on the subtle scales of the SASSI-3 than those without APD?

Subtle scales that assess substance use have been found to be associated with antisocial characteristics. Two subtle scales, the OAT and SAT scales on the SASSI-3, appear to assess APD characteristics rather than substance use. This question examines whether those with APD, as diagnosed according to the SCID-II, score significantly higher on these two scales than those without APD.

- *Hypothesis 5: Substance users with a diagnosis APD have significantly higher scores on the OAT and SAT scales than those not diagnosed with APD.*

Supplementary Question 1. Do substance users in the denial conditions engage in general defensiveness?

One scale on the SASSI-3 and DUSI-R assess for general defensiveness. While the instructions ask the participants to deny aspects of substance use, this question examines whether participants in the complete or partial denial condition had significantly different scores on the general defensiveness scales than in the honest condition.

- *Hypothesis 6: The DEF scale on the SASSI-3 are significantly higher for those in the complete denial and partial denial condition than in the honest condition.*
- *Hypothesis 7: Substance users in the complete and partial denial conditions are significantly higher scores on the Lie Scale on the DUSI-R than those in the honest condition.*

CHAPTER 2

METHODS

Design

The proposed study used a mixed within- and between-subjects design. Each participant completed the study under two different conditions which include an honest condition and an experimental condition. Participants were randomly assigned to two possible experimental conditions, complete denial or partial denial. Those in the partial denial condition were asked to deny the effects of substance use and those in the complete denial condition were asked to completely deny their substance use. In addition, the two denial conditions were also compared to assess for any differences between the substance use measures.

Participants

The sample consists of 102 substance users recruited from a dual diagnosis unit in Timberlawn, an inpatient psychiatric hospital. In accordance with Institutional Review Board requirements, written informed consent was obtained from all participants. Additional information from their hospital chart was collected, which include diagnosis, self-reported drug history, and urinalysis results. Demographic information was collected and descriptive statistics are included.

Inclusion Criteria

The participants included were those who have been diagnosed with either a substance use dependence or abuse disorder based on the Structured Clinical Interview for DSM Disorders-Axis I (SCID-I) Substance Use section.

Exclusion Criteria

Participants were excluded from the data analyses if they did not meet criteria for an abuse or dependence substance use disorder via the SCID-I Substance Use section. Also if patients are experiencing severe withdrawal symptoms or have difficulty with English, they were excluded from the study. Hospital therapists were queried whether the patients were competent to consent before recruiting participants.

Materials

Interview Measures

Structured Clinical Interview for DSM Disorders. Two sections were used from the Structured Clinical Interview for DSM Disorders (First, Spitzer, Williams, & Gibbon, 1997). One of the sections used from the Structured Clinical Interview for DSM Axis I Disorders (SCID-I) was the Substance Use section. The SCID-I Substance Use section is used to diagnose substance dependent and abuse disorders as well as polysubstance dependence, in accordance to the criteria for the *DSM-IV-TR*. The SCID-I Substance Use section provided a baseline measure of the participants' diagnoses and was only administered under the honest condition. The SCID-I Substance Use section demonstrated good concurrent validity for cannabis, opioid, and cocaine abuse/dependence (Kranzler, Kadden, Babor, Tennen, & Rounsaville, 1996). Kranzler et al. (1996) also found excellent discriminant validity for both current and life-time drug abuse/dependence on the SCID-I substance use section.

The Antisocial Personality Disorder (APD) section of the Structured Clinical Interview for DSM Axis II Disorders (SCID-II) was also administered under the honest condition. The SCID-II APD module has also shown good concurrent validity when administered alone (Kranzler et al., 1996).

Substance Use Inventory. The Substance Use Inventory (SUI; Weiss, Hufford, Najavits, & Shaw, 1995) is a self-report instrument used to determine the severity and frequency of substance use in the past seven days. The measure was administered under the honest condition and the participants were asked to consider the seven days before they entered Timberlawn. The measure evaluates the examinee's reported usage of alcohol, cocaine, heroin, marijuana, sedatives, stimulants, PCP, and hallucinogens. Although the SUI is a face valid instrument, previous studies provide evidence of its criterion-related validity (Weiss et al., 1998; Najavits, Weiss, Shaw, & Muenz, 1998). For instance, Najavits et al. (1998) found that 73% of the self reports on the SUI were consistent with urinalysis and breath alcohol results. Interestingly, Najavits et al. (1998) reported that of the 27% that were inconsistent, only one case occurred in which there was a negative self-report and a positive test.

Self Report Measures

These self-report measures were first given under the honest condition, and readministered under an experimental condition.

The Substance Abuse Subtle Screening Inventory, 3rd Edition (SASSI-3). The SASSI-3 (Miller & Lazowski, 1999), the latest edition of the SASSI, contains 93 items, in which there are 67 subtle true-false items whose content is unrelated to substance use and 26 face valid items. The SASSI-3 is intended to use a screening measure for substance use and contains 10 scales: Face Valid Alcohol (FVA), Face Valid Other Drug (FVOD), Symptoms (SYM), Obvious Attributes (OAT), Subtle Attributes (SAT), Defensiveness (DEF), Supplemental Addiction Measure (SAM), Family vs. Control Subjects (FAM), Correctional (COR), and Random Answering Pattern (RAP; Miller & Lazowski, 1999). It uses nine decision rules which determine whether there is a high or low probability of having a substance dependence disorder. Miller and

Lazowski (1999) state that the SASSI-3 can assess for substance dependent disorders regardless of whether the participant is being honest or denying drug use.

The SASSI-3 manual (Miller & Lazowski, 1999) states that the instrument has 98% accuracy in identifying substance dependence disorders according to the *Diagnostic and Statistical Manual (DSM)*. For clients who do not have a substance use disorder, 94% of them will test negative on the SASSI-3 (Miller & Lazowski, 1999). However, independent studies have not found similar results in specificity. The SASSI-3 test manual states the sensitivity of the measure to be 94%; later studies have shown that the sensitivity rates varied from 33% for a college sample to 87% in a corrections sample (Feldstein & Miller, 2007; Svanum & McGrew, 1995; Swartz, 1998). Across all SASSI studies, the SASSI-3's sensitivity averaged 69.8% which indicates the SASSI-3 is detecting almost seven out of ten with substance use dependence (Feldstein & Miller, 2007).

Drug Use Screening Inventory-Revised (DUSI-R). The DUSI-R (Tartar, 1990) is a 159-item questionnaire that evaluates the severity of disturbances over the last year that co-occurs with substance use across several domains utilizing 9 scales: Behaviour Pattern, Health Status, Psychiatric Disorder, Social Competence, Family System, School Performance, Work Adjustment, Peer Relationship, and Leisure/Recreation. As per the manual, the school performance was not analyzed since the participants are all over the age of 18. The DUSI-R includes a validity scale that gauges honesty (Lie Scale) and is intended to detect general deception. The DUSI-R was scored to obtain the absolute problem density which is the percentage of the number of endorsed items in each of the domains.

The bulk of studies have analyzed the original DUSI with little research on the reliability and validity of the DUSI-R. However, the DUSI-R retains the same questions as the DUSI. The

only change was the addition of the above-described Lie scale. Tartar and Kirisci (1997) found that the DUSI has shown good reliability and good discriminant validity differentiating a control sample from participants from a substance dependent treatment program, Research on the Lie scale has mostly been conducted with adolescents. In a sample of 665 Brazilian adolescents, Dalla-Dea, De Micheli, and Souza Formigoni (2003) discovered significant negative correlations between drug use and the Lie scale. Upon further evaluation, these correlations were small and ranged between -0.07 and -0.11. Overall, the Lie Scale classified almost 50% of this sample as engaging in deception. The authors concluded that either half of the sample was engaging in deception or the scale is not an adequate measure of substance denial.

Drug Abuse Screening Test (DAST). The DAST (Skinner & Goldberg, 1986) is a 20 item self-report screening instrument designed for clinical screening and treatment evaluation research. The DAST-20 has demonstrated good internal consistency that ranges from .74 to .92 (Cocco & Carey, 1998; Salstone, Halliwell, & Hayslip, 1994; Skinner, 1982; Skinner & Goldberg, 1986). A cut score of 6 or above was found to best differentiate between persons with and without drug problems (Yudko, Lozhkina, & Fouts, 2007). Even though a completely face valid measure, the DAST has shown good sensitivity (74%) and specificity (83%) with a hit rate of 81% at this cut score (Cocco & Carey, 1998).

Procedure

Participants were recruited from a dual diagnosis unit in an inpatient psychiatric hospital. The patients were informed about the study by an announcement after a morning therapy group. A list of interested participants was presented to the head of the Dual Diagnosis Unit or the lead therapist on the unit, who both had final approval on the participants who participated in the study. Specifically, participants were not approved for the study if the head of the Dual

Diagnosis Unit or the lead therapist on the unit believed the patient would not be cooperative or coherent enough to complete the study.

Data was collected from the participants' medical files. The participants' response on the SUI was compared to the patient's urinalysis to examine if the patients are denying substances that were identified in their urinalysis ($n = 61$).

Session 1 began by discussing information on the consent form (Appendix A). The purpose of the study was explained to participants by the investigator and written informed consent was obtained from all participants. The participants were asked to complete the first half of the study in an honest manner. Each participant was interviewed via the SCID-I Substance Use section. If the participant did not meet for a substance use dependence or abuse diagnosis, they were excused from the remainder of the study. The participants were interviewed via the SUI to assess for drug use the week before they entered the hospital. The participants were then asked to complete three self-reports (SASSI-3, DUSI-R, and the DAST). The last measure in the honest condition administered was the SCID-II Antisocial Personality Disorder section due to the nature of the questions.

Session 2 began with the experimental condition instructions, either the partial denial or complete denial instructions (see Appendix B). The participants were given these instructions to read. The participants were asked to explain the instructions back to the researcher to ensure that they comprehended the instructions given. The participants were administered the three self-reports (SASSI-3, DUSI-R, and DAST) again under the experimental condition.

Lastly, the participants completed a manipulation check (Appendix C). The manipulation check assessed whether the participant knew the instructions for the experimental condition, adhered to following the instructions, and the amount of effort put into following the

instructions. Participants were debriefed and compensated \$10.00 for their participation. Each participant was tested individually and treated ethically. Following data collection, the manipulation check was used to exclude patients from further data analyses if they did not know or follow the experimental condition's instructions, or did not put an adequate amount of effort into following the instructions.

CHAPTER 3

RESULTS

Four participants were excused early from the study due to withdrawal symptoms ($n = 2$), difficulty with English ($n = 1$), and not meeting criteria for a substance use disorder ($n = 1$). Of those that completed the study, a manipulation check was implemented at the conclusion of the study. The purpose of the manipulation check was to exclude those participants who did not comply with the instructions or put forth adequate effort. Seven participants were excluded because they could not correctly recall their experimental condition. The one remaining participant acknowledged putting forth an inadequate amount of effort in following the instructions. As a result, 8 were excluded from the 110 substance users originally interviewed.

Within treatment settings, substance users can be categorized by substance type and concomitant impairment, including dependencies. For the descriptive data, comparisons were calculated between substance users with single and multiple dependencies. The rationale in examining these groups separately is that substance users with multiple dependencies have poorer treatment outcomes than those with single dependencies (Martinotti et al., 2009). Therefore, substance users with multiple dependencies may prove to be more challenging to accurately assess and treat.

Descriptive Data

Consistent with past national surveys on substance use (HHS, 2008a), male substance users were overrepresented, with 69 males (67.6%) and 33 females (32.4%) in the current sample. Interestingly, males and females were not evenly distributed among the dependency categories (see Table 1). While females were almost evenly divided between single and multiple dependency categories, most males (76.9%) had multiple substance dependencies.

Table 1

Demographic Variables for Inpatient Substance Users between Single and Multiple Dependencies

	Single		Multiple		χ^2	<i>p</i>
	<i>n</i>	%	<i>n</i>	%		
Gender					4.86	.03
Males	15	23.1	50	76.9		
Female	14	45.2	17	54.8		
Ethnicity ^a					1.17	.28
African American	14	35.9	25	64.1		
European American	11	25.0	33	75.0		
Marital Status ^{b,c}					4.40	.11
Single	8	22.2	28	77.8		
Married	13	44.8	16	55.2		
Divorced	7	25.0	21	75.0		

Note. Single = participants met criteria for substance dependence on only one substance. Multiple = participants met criteria for substance dependence on more than one substance or diagnosed as poly-substance dependent. Participants ($n = 6$) who only met for a substance abuse diagnosis were not included in these chi-square analyses.

^a Other ethnicity categories were not included in the analysis due to the low number of participants in the other categories. These categories included Latin Americans ($n = 11$), Asian American ($n = 1$), Native American ($n = 1$), and those that classified themselves as Other ($n = 3$).

^b The widow category (i.e., $n = 3$) was not included in the analysis due to the low number of participants in the category.

^c Even when the single and divorced categories were combined, there were no significant differences between those who were married and not married when compared to single and multiple dependencies.

Regarding their demographic backgrounds, the overall sample had an average age of 41.78 ($SD = 10.70$) years, with a wide range of 18 to 63 years. Similar to results found by Martinotti and his colleagues (2009), a non-significant trend was observed in age; single dependency users ($M = 44.93$, $SD = 8.63$) tended to be older than those with multiple dependencies ($M = 40.99$, $SD = 11.33$, $F = 2.80$, $p < 0.10$, $d = 0.37$). Based on self-identification, the racial/ethnic composition was primarily European American (45 or 44.1%) and African American (41 or 40.2%) with smaller numbers of Latin Americans (11 or 10.8%), Asian American (1 or 1.0%), Native American (1 or 1.0%), and those that classified themselves as

Other (3 or 2.9%). The vast majority (88.1%) had completed their high school education but a small number (3.0%) had less than a ninth grade education. Overall, the average was 12.66 years ($SD = 2.21$) of education. Regarding marital status, most divorced (75.0%) and single (77.8%) participants had multiple dependencies, suggesting that those with multiple dependencies may have more trouble maintaining long-term relationships. Similarly, Martinotti and his colleagues (2009) found that participants with multiple dependencies were more likely to be divorced or separated.

Important considerations with substance using populations include their past treatment history and their prior experiences with the criminal justice system. This sample reported an extensive history with the criminal justice system such that 30.4% of the substance users were arrested more than 5 times (Table 2). When queried about their charges, 37.2% of the sample reported that their most serious charge was directly related to substance use (e.g., DWI or possession of a controlled substance). Other reported charges (e.g., assault and theft) may have also been influenced by the substance user's addiction; however, the available data are insufficient to evaluate the role of alcohol or drugs in the commission of these crimes. As expected, substance users also reported an extensive history of substance use treatment with 40% of the sample reporting participation in at least five separate prior substance use treatments. In contrast, only one substance user was in treatment for the first time.

Table 2

Demographic Differences between Single and Multiple Dependencies

	Total <i>n</i> = 102		Single <i>n</i> = 29		Multiple <i>n</i> = 67		<i>F</i>	<i>p</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Age	41.78	10.70	44.93	8.66	40.99	11.33	2.80	.10	.37
Education	12.66	2.21	13.00	1.87	12.61	2.37	0.63	.43	.18
Times in treatment	5.35	5.69	4.17	2.67	5.98	6.49	2.08	.15	-.34
Times arrested	5.34	6.68	4.45	9.28	5.88	5.47	0.89	.35	-.22
GAF on Admission	26.45	6.10	26.21	7.52	26.59	5.64	0.08	.78	-.06

Note. Single = participants who met criteria for substance dependence on only one substance. Multiple = participants who met criteria for substance dependence on two or more substances or diagnosed as poly-substance dependent. Participants (*n* = 6) who only met for a substance abuse diagnosis were not included in these ANOVA analyses.

Like most treatment settings, the admissions evaluation at Timberlawn is a streamlined process with an initial estimate of Global Assessment of Functioning (GAF). As expected, substance users demonstrated severe impairment with an average GAF of 26.45, ranging from 5 to 45, with no significant difference between those with single and multiple dependencies. As further evidence of their impairment, approximately two-thirds (65.7%) of the participants were on disability and another 22.5% unemployed at the time of admission. These percentages likely indicate a significant amount of substance use-related impairment with only 7.9% holding gainful employment.

Provisional diagnostic information was collected from medical charts at the time of their intake assessments. Predictably, most patients were diagnosed with a Substance Use Disorder (88 or 86.3%). Among other Axis I diagnoses, mood disorders predominated (75.5%), indicating that a large majority of the sample had comorbid substance use and mood disorders as is often

documented in other inpatient substance use samples (Burns & Teesson, 2002; Grant et al., 2004; Hasin, Goodwin, Stinson, & Grant, 2005; Kessler et al., 1997).

Due to the inconsistent nature of the medical chart diagnoses in most hospital settings, the participants were also evaluated via the Structured Clinical Interview for DSM Axis I Disorders (SCID-I) Substance Use section to systematically assess for substance use disorders. Standardized interviews not only reduce the number of missed diagnoses and misdiagnoses, but also increase diagnostic reliability through their standardized questions and concomitant ratings (Rogers, 2001). When comparing the SCID-I substance use disorders to participants' medical charts, the SCID-I detected 14 diagnoses of substance use disorders that were not identified by the initial assessment intake conducted by the Timberlawn staff. Table 3 includes the SCID-I classification of the substance use disorders by drug type.

Table 3

Substance Use Disorders by Drug Type via the SCID-I Substance Use Section

	Percentage Who Meet Criteria	Age of Onset	
		<i>M</i>	<i>SD</i>
Sedative/Hypnotics			
Abuse	8.8	25.22	7.69
Dependence	8.8	22.67	9.06
Cannabis			
Abuse	24.5	17.00	5.19
Dependence	28.4	16.63	5.59
Stimulants			
Abuse	7.8	23.00	7.94
Dependence	16.7	26.11	9.44
Opioid			
Abuse	4.9	27.00	7.44
Dependence	23.5	27.91	9.71
Cocaine			
Abuse	7.8	21.71	3.50
Dependence	62.7	27.80	9.56
Hallucinogens/PCP			
Abuse	11.8	17.84	2.88
Dependence	3.9	18.50	3.79
Other Substance			
Abuse	7.8	18.44	7.75
Dependence	3.9	25.17	6.40
Poly-substance Dependence	24.5	21.20	7.12

Partial Verification of Reported Drug Use

As documented in the Introduction, substance users are often not entirely forthcoming about the range of illegal substances they have abused. As noted, the rates of denial can vary depending on the type of substance as well as the current point in treatment. In the current study, confidentiality was explained in detail to each participant to encourage full disclosure. They were also assured of anonymity. Importantly, the current sample voluntarily sought substance use treatment which may make them more motivated to be honest in their reporting than those in treatment involuntarily. As expected, the rates of denial among the sample were minimal. Of

substance users with a positive urinalysis for cocaine, 96.1% reported using the cocaine days before entering the unit to the interviewer, a partial indicator that the reported drug use among the current sample was highly accurate. Of the two cocaine deniers, one of these participants denied cocaine use across all substance use measures in the study. In fact, this participant only admitted to using marijuana and barely endorsed enough items to meet criteria for Cannabis Abuse. It is likely that the participant also denied their substance use to clinical staff at Timberlawn, because the clinical staff at the hospital did not diagnose this participant with a substance use disorder. The second cocaine denier participant admitted to cocaine use during the SCID-I Substance Use Section and met criteria for cocaine dependence; therefore, it is unclear why the participant admitted to cocaine dependence criteria, but denied using cocaine the week before entering treatment. It is possible that the second participant did not intentionally deny use, but did not remember using cocaine the week before entering treatment. As stated previously, more severely sanctioned drugs, such as cocaine, are more likely to be denied; therefore, the rates of denial might be even lower with drugs such as marijuana.

Research Questions

To address the research questions of the current study, a between- and within-subjects design was implemented. All substance users were asked to complete the self-report substance use measures (SASSI-3, DUSI-R, and DAST) honestly and then were readministered the measures under an experimental condition. Of the 102 substance users analyzed, 51 were randomly assigned to the complete denial instructions and 51 to the partial denial (denial of effects) instructions for the experimental condition (see *Methods* section).

Research Question 1

The first research question examines whether the two denial conditions show significantly different responses on the substance use measures. This research question determines whether the partial denial and complete denial should be analyzed separately. Table 4 examines the classification rates between the denial conditions on the SASSI-3. As predicted, the classification rates between the denial conditions differentiated substantially. Importantly, a substantial amount of substance users were able to avoid detection on the SASSI-3. In fact, four out of five substance users (80.4%) in the complete denial condition successfully avoided detection and almost half (45.1%) of partial deniers succeeded as well.

Table 4

Comparing the SASSI-3 Classification between Denial Conditions

	Complete Denial		Partial Denial		χ^2	Φ
	<i>n</i>	%	<i>n</i>	%		
SASSI-3 Classification					13.59	.13
Not Substance Dependent	41	80.4	23	45.1		
Substance Dependent	10	19.6	28	54.9		

Note. Chi-Square test was significant at the $p < .001$ level.

Table 5 includes a further analysis of the differences on each SASSI-3 scale between denial conditions. The detection strategies of the SASSI-3 scales can be conceptualized as obvious, subtle, mixed, general, and supplemental. This conceptualization was created for the purpose of this study and will be utilized in further discussion of the SASSI-3. The authors of the SASSI-3 did not provide any conceptualization of the scales.

Table 5

Differences in SASSI-3 Scales between Denial Conditions

SASSI-3 Scales	Detection Strategy Categories	Complete Denial		Partial Denial		<i>F</i>	Cohen's <i>d</i>
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Face-Valid Drug (FVOD) Symptoms (SYM)	Obvious	2.52	5.95	11.02	11.91	20.46***	-.95
Obvious Attributes (OAT)	Obvious	2.18	2.93	3.97	3.36	8.16**	-.57
Subtle Attributes (SAT)	Subtle	2.63	2.49	4.08	2.80	7.65**	-.55
Defensiveness (DEF)	Subtle	2.63	1.22	3.22	1.40	5.11*	-.45
Supplemental Addiction Measure (SAM)	General	7.76	2.80	7.45	2.51	.37	.12
Family vs. Control Subjects (FAM)	Mixed	5.53	1.92	7.00	2.09	13.69***	-.73
Correctional (COR)	Supplemental	9.35	2.30	8.65	2.28	2.42	.31
	Supplemental	3.43	2.90	4.69	3.41	4.01*	-.40

Note. For significance, * $p < .05$, ** $p < .01$, *** $p < .001$. Obvious = highly face valid scales. Subtle = scales utilizing indirect items to detect substance use. General = scale that consisted of general defensiveness items. Mixed = scale that used several different detection strategies. Supplemental = scales that do not contribute to the decision rules.

Further investigation of the SASSI-3 revealed the complete denial condition was significantly lower than the partial denial condition on all of the SASSI-3 scales except for Defensiveness (DEF) and Family vs. Controls (FAM). Elevations on the DEF scale, a general scale, indicate that the individual avoids acknowledgment of any signs of personal limitations and faults (Miller & Lazowski, 1999) which indicate that substance users in both denial conditions were engaging in similarly moderate amounts of general defensiveness. The FAM scale assesses whether the individual has family members that misuse substances and is a supplemental scale that does not contribute to the SASSI-3 decision rules. Substance users in both denial conditions acknowledged a substantial family history of substance use. See Research Question 2 for further analysis on how each denial condition compares to the honest condition on the SASSI-3, DAST, and DUSI-R.

Of the two face valid scales, the FVOD scale showed the most differentiation between the denial conditions ($d = -.95$). The other face valid scale, SYM scale, produced a moderate effect size ($d = -.57$); this scale differs from the FVOD in that items ask about the causes, consequences, and correlates of substance misuse, while the FVOD scale directly inquires about substance use.

The subtle scales (OAT and SAT) on the SASSI-3 produced moderate effect sizes between the denial conditions ($ds = -.55$ and $-.45$, respectively). Unlike the OAT, items on the SAT scale were included because they discriminated between dependent and nondependent people, *regardless* of whether they were responding under standard instructions or denial instructions asking them to conceal evidence of substance abuse (Miller & Lazowski, 1999).

The Supplemental Addiction Measure (SAM) scale showed the second largest effect size ($d = -.73$) between the two denial conditions. Interestingly, the items on the SAM scale were chosen because they discriminated between substance dependent and nondependent people who were responding under fake-good instructions. Those in the partial denial condition had greater SAM scores than the other denial condition, indicating that partial deniers endorse more items than complete deniers on this scale which was intended to detect substance users who were “faking good.”

Since the SASSI-3 uses scales to make decisions on substance use, a further analysis of these scales in terms of their cut scores was necessary. Overall, the SASSI-3 decision rules did not detect 80.4% of complete deniers and 45.1% of partial deniers. As demonstrated in Table 6, the decision rules of the SASSI-3 that included only the obvious scales (FVOD and SYM) detected more substance users in both denial conditions than the subtle scales. In fact, the subtle scales (OAT and SAT) which were designed to identify non-disclosing substance use deniers

generally failed; only 12 substance users (one complete denial and 11 partial denial) were identified. However, 10 of those substance users were also identified by a decision rule consisting of an obvious scale. To summarize, the SASSI-3 decision rules only detected 19.6% of substance users in the complete denial condition and 80.0% of these were detected simply by the decision rules using the face valid scales only. A similar but less dramatic pattern emerged for the partial denial group; the obvious decision rules detected almost two-thirds (64.3%) of the *detected* substance users. The last three decision rules on the SASSI-3, which combine several scales, only detected one previously undetected substance user in the complete denial condition and seven in the partial denial condition.

Table 6

Substance Users Detected by the Decision Rules of the SASSI-3 across Denial Conditions

Decision Rule Scales ^a	Partial Denial				Complete Denial			
	<i>n</i>	<i>n</i> ^b	%	% ^c	<i>n</i>	<i>n</i> ^b	%	% ^c
FVOD	12	12	23.5	23.5	3	3	5.9	5.9
SYM	15	18	29.4	35.3	7	8	13.7	15.7
OAT	1	19	2.0	37.3	0	8	0.0	15.7
SAT	4	20	7.8	39.2	1	9	2.0	17.6
OAT & SAT	6	20	11.8	39.2	0	9	0.0	17.6
FVOD & SAM	13	20	25.5	39.2	5	9	9.8	17.6
OAT & DEF & SAM	2	21	3.9	41.2	0	9	0.0	17.6
FVOD & SAT & DEF & SAM	21	28	41.2	54.9	6	10	11.8	19.6

Note. For the purposes of this study, the Face Valid Alcohol (FVA) scale was not included in the analyses. To examine the statistical analyses including the FVA scale, refer to Appendix D. The overall rate of classification of substance dependence on the SASSI-3 did not change when the FVA was added to the analysis.

^a Scales that contribute to the decision rule

^b The cumulative number of individuals detected by the SASSI-3 scales

^c The cumulative percentage of individuals detected by the SASSI-3 scales

Several analyses were performed to investigate whether any important differences emerged between those detected and not detected by the SASSI-3 in the denial conditions. There

were no significant differences between the groups pertaining to demographics and antisocial characteristics (see Appendix E). Interestingly, there were non-significant trends between severity of substance use problems, as measured by the DAST, and number of reported arrests. It is likely that those with such severe substance use problems found it more difficult to avoid detection when under the denial conditions.

Table 7

Differences on the DAST and DUSI-R Scores between Denial Conditions

	Complete Denial		Partial Denial		<i>F</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Total DAST Score	1.47	3.16	5.61	5.61	21.03***	-.94
DUSI-R						
Substance Use	1.06	2.30	3.59	4.39	13.27***	-.76
Behavior Pattern	2.57	3.53	5.64	5.25	11.96**	-.70
Health Status	1.69	1.90	3.12	2.38	11.17**	-.67
Psychiatric Disorder	2.10	3.75	6.00	5.91	15.62***	-.81
Social Competence	2.58	2.84	3.52	3.22	2.40	-.31
Family System	2.18	3.13	4.94	3.88	15.47***	-.79
Work Adjustment	.78	1.63	2.16	2.98	8.32**	-.60
Peer Relationship	2.27	3.53	4.88	4.08	11.92**	-.69
Leisure Recreation	2.29	2.74	5.04	3.53	19.24***	-.88
Lie Scale	6.16	2.69	4.51	2.42	10.55**	.65

Note. For significance, * $p < .05$, ** $p < .01$, *** $p < .001$.

While the SASSI-3 uses several different strategies, the DAST only utilizes face valid items to identify substance users. The DAST, one of the most commonly used substance use screening measures, showed significant differences between the two denial conditions as expected. Similarly to the FVOD scale on the SASSI-3, the DAST produced a large effect size of -.94 between the two denial conditions (Table 7). Substance users in the complete denial condition almost uniformly responded negatively to all items on the DAST. In fact, there appears

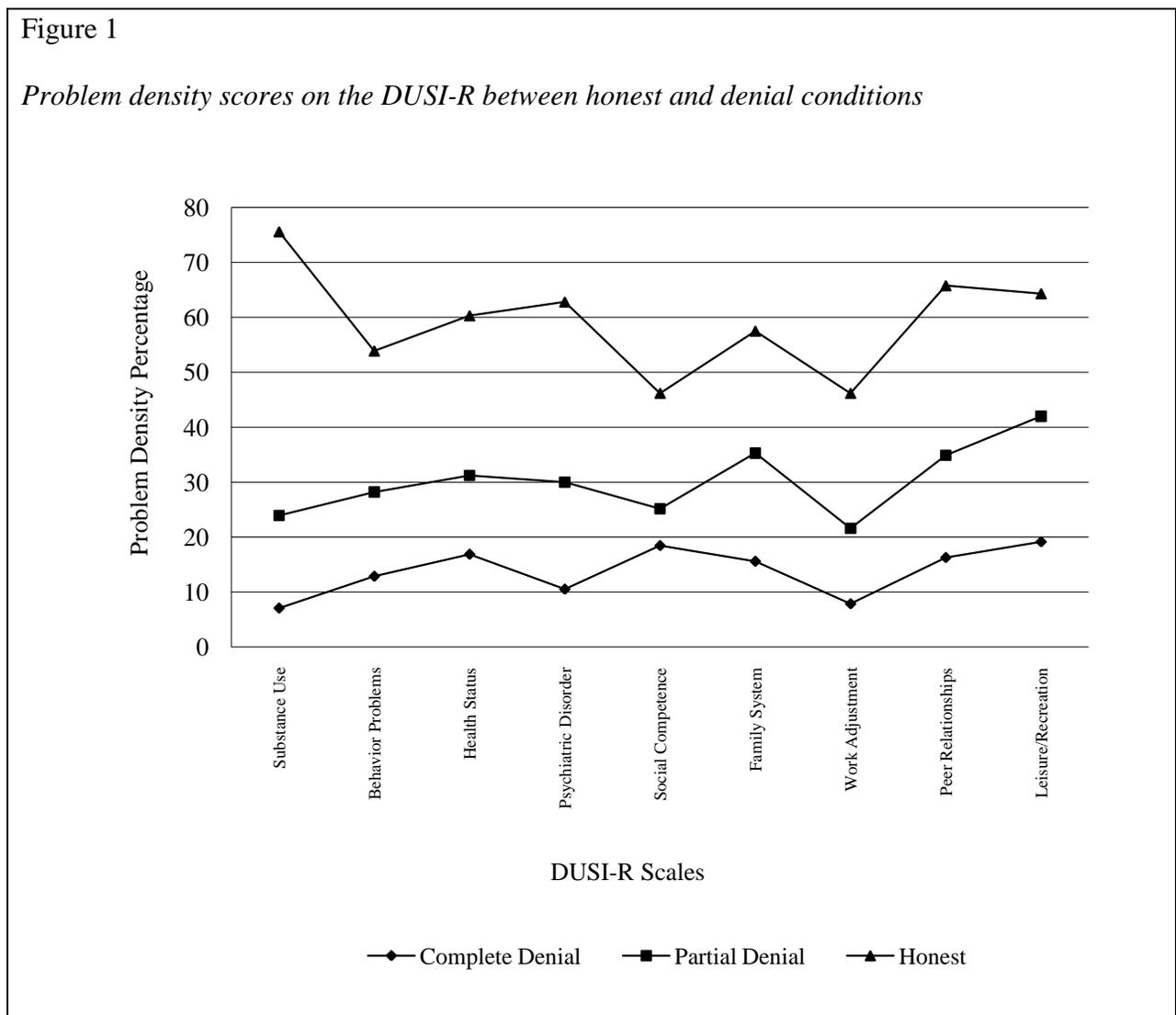
to be a floor effect in the complete denial condition, with 19 DAST items being endorsed less than 20% of the time. Interestingly, only one item on the DAST was endorsed by complete deniers over half the time; it asked individuals if they used drugs for non-medical reasons. A possible interpretation is that participants may have thought the question was referring to the use of prescription drugs, which are legal to use. Interestingly, the items that were endorsed by partial deniers include items about the breadth of substance use, seeking help for substance use, and motivations for treatment. To examine the differences in items endorsed by substance users in each condition, please refer to Appendices E and F. See Table 8 for examination of the difference between DAST scores of those in the denial and honest conditions.

The DUSI-R's 9 scales assess the impact of substance use on different aspects of an individual's life, such as in work settings or relationships. Each domain of the DUSI-R was significantly different between the denial conditions, except for the Social Competence scale. Appendix F shows that the Social Competence scale was significantly lower for both denial conditions as compared to the honest responses, demonstrating that those in the denial conditions similarly lowered their scores on this scale to indicate little or no problems with their social interactions. Therefore, the Social Competence scale does not have any discriminant validity between denial conditions in the current study. Overall, the rest of the scales on the DUSI-R showed moderate effect sizes ($d_s = -.60$ to $-.88$). The Lie Scale, the only comparison in which the complete denial responses were higher than the partial denial, will be discussed in more detail in the Supplementary Question analysis.

The DUSI-R has been used to classify substance users using a cut score of four or higher on the Substance Use Scale (Tartar & Kirisci, 1997). Under the honest condition, most (98.0%) substance users were correctly categorized; however, 88.2% of complete deniers were

successfully able to avoid detection on this scale. Most notably, 70.6% of complete deniers endorsed *no* items on this scale. For partial deniers, 72.5% avoided detection (i.e., < 4 on Substance Use Scale) and 49% endorsed *no* items on this scale.

In addition to individualized scales, the DUSI-R can be scored using the absolute problem density score. These problem density scores are calculated as the percentage of endorsed items in each of the domains. Figure 1 is a visual demonstration of the differences in problem density scores between the honest and denial conditions.



Overall, across the three substance use measures, the partial and complete denial conditions yielded statistically significant differences and will continue to be analyzed separately throughout the current study.

Research Question 2

Research Question 2 differs from the first research question by its comparison between the honest and denial conditions. Based on previous results, the complete denial condition should differ from the honest condition; however, it is unclear how the partial deniers will compare to honest responders.

Both the DAST and FVOD scale use obvious, face-valid items. Therefore, it is not surprising that complete deniers on the face valid DAST and FVOD (Tables 8 and 9) reduced their scores to almost zero. As a result, their differences with the honest condition produced dramatically large effect sizes for the DAST and FVOD scale ($d = 3.35$ and 2.94 , respectively). As predicted, this finding indicates that complete deniers can easily avoid detection on face valid substance use scales and measures. A similar pattern emerged with partial deniers, such that partial deniers were able to significantly lower their scores on these face valid measures.

Table 8

DAST Total Score Differences between Honest and Denial Conditions

	Honest		Complete Denial		<i>F</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Total DAST Score	13.33	3.92	1.47	3.16	287.53	3.35

	Honest		Partial Denial		<i>F</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Total DAST Score	13.06	4.20	5.61	5.61	74.49	1.52

Note. Both ANOVAs were significant at the $p < .001$ level. These analyses were kept in separate tables due to the mixed between and within design.

A previously unexamined question is whether complete deniers are equally successful on the less face valid measures, specifically the subtle scales. According to the SASSI-3 manual, the two subtle scales (OAT and SAT) can detect substance users even when they are motivated to deny their use (Miller & Lazowski, 1999). Individuals in both denial conditions were able to significantly lower their scores on these scales as well, indicating that these scales are still affected when substance users deny some, or all, aspects of substance use (Table 9). In fact, the OAT scale produced a large effect size comparable to the obvious scales for the complete and partial deniers. Interestingly, the SAT scale yielded a much smaller effect size compared to all the SASSI-3 scales for the complete ($d = 1.01$) and partial deniers ($d = 0.53$). Furthermore, the comparison between partial denial and honest condition on the SAT scale had the lowest effect size of all the SASSI-3 scales. Importantly, the SAT did not identify any new honest substance users, indicating that the SAT scale lacks utility in discriminating between conditions.

Table 9

Differences between SASSI-3 Scales between Honest and Denial Conditions

	Honest		Complete Denial		<i>F</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Face-Valid Drug (FVOD)	25.96	9.99	2.52	5.95	220.88***	2.94
Symptoms (SYM)	7.84	1.93	2.18	2.93	149.06***	2.33
Obvious Attributes (OAT)	7.69	1.87	2.63	2.49	171.36***	2.32
Subtle Attributes (SAT)	3.98	1.45	2.63	1.22	26.88***	1.01
Defensiveness (DEF)	3.10	1.81	7.76	2.80	89.96***	-2.02
Supplemental Addiction Measure (SAM)	9.55	1.55	5.53	1.92	142.57***	2.32
Family vs. Control Subjects (FAM)	6.16	1.69	9.35	2.30	61.72***	-1.60
Correctional (COR)	9.51	2.17	3.43	2.90	151.55***	2.40

Note. For significance, * $p < .05$, ** $p < .01$, *** $p < .001$.

	Honest		Partial Denial		<i>F</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Face-Valid Drug (FVOD)	26.10	9.90	11.02	11.91	62.52***	1.38
Symptoms (SYM)	7.88	1.14	3.97	3.36	43.30***	1.48
Obvious Attributes (OAT)	7.14	1.91	4.08	2.80	37.00***	1.30
Subtle Attributes (SAT)	3.96	1.39	3.22	1.40	8.76**	0.53
Defensiveness (DEF)	3.08	2.03	7.45	2.51	76.19***	-1.93
Supplemental Addiction Measure (SAM)	9.16	1.49	7.00	2.09	34.02***	1.21
Family vs. Control Subjects (FAM)	6.24	1.89	8.65	2.28	37.80***	-1.16
Correctional (COR)	9.31	2.58	4.69	3.41	44.04***	1.54

Note. For significance, * $p < .05$, ** $p < .01$, *** $p < .001$.

For professional practice, a crucial issue is whether substance users can avoid detection when using established cut scores. Specifically for the SASSI-3, these cut scores categorize substance users as substance dependent or not. Of particular interest, cut scores for two subtle scales (OAT and SAT) were examined because they are meant to detect denied substance use. In the complete denial condition, none (0.0%) of the substance users were detected on the OAT

scale and only one of 51 (2.0%) substance users were detected by the SAT scale. As for the partial denial condition, one substance user (2.0%) was detected on the OAT scale and four (7.8%) on the SAT scale. These findings indicate that subtle scales are not effective in detecting those engaged in partial or complete denial. As a practical matter, no lower cut score could be effective because the partial and complete denial scores have lower mean scores than the honest condition.

The subtle scales appear to have very limited utility with honest substance users. The OAT and SAT decision rules only detected 14 individuals in the honest condition (Table 10). Similar to observations of the denial conditions, all 14 of these substance users had been detected by the obvious scales; therefore, the subtle scales lacked any incremental accuracy. The SASSI-3 includes a complex decision rule that combines the OAT scale with a general defensiveness (DEF) and supplemental (SAM) scale. Unfortunately, no substance user in the honest condition was captured by this complex OAT, DEF, and SAM decision rule. Two other mixed decision rules identified five previously identified substance users. While the SASSI-3 was innovative in its attempt to utilize different types of detection strategies, the current findings show that the non-direct decision rules have a minimally improved utility over the obvious scales alone with honest responders.

Table 10

Substance Users Detected by the Decision Rules of the SASSI-3 across All Conditions

Decision Rule Scales ^a	Honest Condition				Partial Denial				Complete Denial			
	<i>n</i>	<i>n</i> ^b	%	% ^c	<i>n</i>	<i>n</i> ^b	%	% ^c	<i>n</i>	<i>n</i> ^b	%	% ^c
FVOD	82	82	80.4	80.4	12	12	23.5	23.5	3	3	5.9	5.9
SYM	82	95	80.4	93.1	15	18	29.4	35.3	7	8	13.7	15.7
OAT	14	95	13.7	93.1	1	19	2.0	37.3	0	8	0.0	15.7
SAT	14	95	13.7	93.1	4	20	7.8	39.2	1	9	2.0	17.6
OAT & SAT	29	95	28.4	93.1	6	20	11.8	39.2	0	9	0.0	17.6
FVOD & SAM	88	97	86.3	95.1	13	20	25.5	39.2	5	9	9.8	17.6
OAT & DEF & SAM	0	97	0.0	95.1	2	21	3.9	41.2	0	9	0.0	17.6
FVOD & SAT & DEF & SAM	39	100	38.2	98.0	21	28	41.2	54.9	6	10	11.8	19.6

Note. For the purposes of this study, the Face Valid Alcohol (FVA) scale was not included in the analyses. To examine the statistical analyses including the FVA scale, refer to Appendix D. The overall rate of classification of substance dependence on the SASSI-3 did not change when the FVA was added to the analysis.

^a Scales that contribute to the decision rule

^b The cumulative number of individuals detected by the SASSI-3 scales

^c The cumulative percentage of individuals detected by the SASSI-3 scales

Two McNemar tests were conducted to determine if the SASSI-3 classification rates changed significantly between the honest condition and the denial conditions. Specifically, the McNemar examines the classification change from substance dependent to not substance dependent, due to the experimental condition. The change was significant for both partial denial, *McNemar's* χ^2 (1, *n* = 50) = 18.38, *p* < .05, and complete denial condition, *McNemar's* χ^2 (1, *n* = 50) = 38.08, *p* < .05. When compared to the honest condition, the complete deniers showed more change than the partial denial condition. Most complete deniers (80.4%) avoided detection on the SASSI-3 as compared to slightly less than half (45.1%) of partial deniers.

Research Question 3

The subtle scales (OAT and SAT) of the SASSI-3 appear to consist of items related to antisocial behaviors; therefore, Research Question 3 examined the differences on SASSI-3 subtle scales between substance users with and without the diagnosis of APD. As predicted, participants with APD scored higher on both of these scales, resulting in medium effect sizes (Table 11).

Table 11

The Influence of APD on Subtle Scales on the SASSI-3

	APD <i>n</i> = 33		Non-APD <i>n</i> = 69		<i>F</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
OAT Scale	8.00	1.72	7.06	1.89	6.59*	.51
SAT Scale	4.47	1.47	3.81	1.38	5.58	.47

Note. APD = Participants who met for the full criteria of APD; Non-APD = Participants who did not meet full criteria of APD. These analyses consisted of responses in the honest condition. For significance, * $p < .05$.

A further analysis was necessary to examine whether the APD differences could be explained by the differences in severity of substance use between the two groups. A hierarchical multiple regression was conducted to examine the relationship between APD and the subtle scales, while controlling for severity of substance use via the DAST total score (see Table 12). The number of endorsed APD criteria was used as a continuous variable in the analysis. Contrary to predictions, the number of APD criteria was not a significant predictor of OAT and SAT scores, after controlling for the severity of substance use. This finding indicates the presence of a complex relationship between APD and substance use. The utilization of APD items to detect substance use needs more exploration and will be discussed further in the *Discussion* section.

Table 12

APD Criteria as a Predictor for Subtle Scales on the SASSI-3

Predictors	R	R ²	Δ R ²	F
Dependent variable- OAT Scale				
Step 1				
DAST Scores	.43	.19		
Step 2				
APD Criteria ^a	.47	.22	.03	15.18***
Dependent variable- SAT Scale				
Step 1				
DAST Scores	.29	.08		
Step 2				
APD Criteria ^a	.31	.10	.02	5.69**

Note. For significance, * $p < .05$, ** $p < .01$, *** $p < .001$.

^a APD Criteria = the number of APD criteria that the substance user met for

Supplementary Question

A clinically relevant issue is whether measures of general defensiveness can be used to detect substance use denial. Because several substance use measures employ general defensiveness scales, this supplementary question was to evaluate whether the general defensiveness scales would elevate in the denial conditions. Both the SASSI-3 and DUSI-R measures include a general defensiveness scale (the DEF and Lie scales). Overall, both scales showed very large effect sizes (Table 13). On the SASSI-3 and DUSI-R, the general defensiveness scales were significantly higher for both the complete and partial denial conditions when compared to the substance users' honest answers. Overall, the participants were engaging in substance use denial as well as general defensiveness; the possible implications of this result will be addressed further in the *Discussion* section.

Table 13

General Defensiveness in the Denial Conditions

	Honest		Complete Denial		<i>F</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
DEF Scale	3.10	1.81	7.76	2.80	89.96***	-2.02
Lie Scale	1.71	1.53	6.16	2.69	125.47***	-2.11

Note. Both ANOVAs were significant at the $p < .001$ level.

	Honest		Partial Denial		<i>F</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
DEF Scale	3.08	2.03	7.45	2.51	76.19***	-1.93
Lie Scale	1.57	1.43	4.51	2.42	77.45***	-1.53

Note. Both ANOVAs were significant at the $p < .001$ level.

CHAPTER 4

DISCUSSION

Psychological assessment is a fundamental component in the practice of professional psychology (Groth-Marnat, 2009). Currently, 91% of all practicing psychologists engage in assessment and spend 10-25% of their professional time conducting psychological assessments (Camara, Nathan, & Puente, 2000; Watkins, 1991; Watkins, Campbell, Nieberding, & Hallmark, 1995). Regarding the methods used, survey data indicate that self-report inventories are the most widely used measures of psychological assessment in the United States (Camara et al., 2000). Self-report approaches via inventories continue to be economical in preserving professional resources and health-care expenditures. This method of psychological assessment typically involves asking respondents to indicate whether—and often to what extent—particular symptoms, behaviors, and personality descriptors are characteristic of them (Naglieri & Graham, 2003).

Self-report inventories have been developed to assess various dimensions of psychopathology. The earliest attempts of assessment relied upon the willingness of patients to be forthright on highly face valid measures. Patients were queried about their symptoms directly with clinicians expecting straightforward responses. Later, scales on self-report inventories were constructed using empirical procedures. Empirical keying, in which items were selected for their ability to differentiate symptomology rather than their obvious content, became a popular approach to identify psychological problems.

As psychological assessment has advanced, the consideration of deception has become a major concern especially when assessing symptoms that are perceived to have high social and/or legal sanctions. To address this issue, psychologists have created assessment tools that are

designed to detect symptoms among examinees who may be denying their problems or symptoms. One advantage that some self-report inventories have over other assessment methods is that they include embedded scales and indices that assess response styles. For example, a major issue is whether respondents are over- or underreporting problems or symptoms to create the impression of being either more adjusted or more maladjusted than they really are (Naglieri & Graham, 2003).

Models of Substance Use Assessment

Most practitioners, regardless of the specific clinical population assessed in their practice, are fully aware of the frequency of substance use and the concomitant need for effective substance use assessments (Adesso, Cisler, Larus, & Hayes, 2004). According to the latest national survey of substance use, 22.3 million adults in the U.S. struggle with substance dependence or abuse (HHS, 2008a). Importantly, psychologists working with populations such as veterans, adolescents, and offenders will likely encounter substance users more often and will be expected to have a working knowledge regarding the complexity of substance use assessment. For example, it is estimated that of the 256,000 veterans in need of treatment for drug use in the past year, only 20% received treatment (HHS, 2002). As a parallel, practitioners working with adolescents will encounter substance use more often, such that nearly one of every ten adolescents is a current illicit drug user (HHS, 2008a). As noted in the introduction, the offender population is of special concern due to the high prevalence of substance use and concomitant deception among offenders. The exact prevalence rate of this population is unclear as research has shown a wide fluctuation in prevalence rate, depending on the sample surveyed. Research studies have estimated that the prevalence ranges from 28% to 91% (DOJ, 2005; Peters et al., 1998).

Deception among substance users, commonly seen in forensic and non-forensic settings, can affect clinicians' abilities to obtain an accurate substance use assessment. Behaviors related to substance use are not only seen as socially undesirable, but there are legal consequences for even possessing (i.e., illegal drugs) or misusing (i.e., prescription medications) these substances. Therefore, substance users may be strongly motivated to deny or minimize their use to clinicians. Furthermore, users may not be able to give an accurate account of substances used due to genuine memory loss or ingesting unknown substances. An accurate clinical assessment with substance users is especially important because it can offer a more favorable treatment outcome (Milby & Stainback, 1991). The issue becomes even more important when the rates of comorbidity are considered. For those presenting for mental health treatment, on average 50% will also have substance use disorders (Miller, Belkin, & Gibbons, 1994). Therefore when substance use is not reported to an evaluating clinician, symptoms created or worsened by ongoing substance use may be misattributed to behavioral, cognitive, or emotional dysfunction (Dodgen & Kadish, 1992).

As noted in the Introduction, Stein and Rogers (2008) carefully distinguished between several different response styles utilized by substance users. *Disacknowledgement* characterizes the response style in which the persons claim to not know the amount, type, or consequences of their drug use. *Misappraisal* describes those who unintentionally report incorrect substance use information. When the type, amount, impairment, or effects of substance use are intentionally minimized or unacknowledged is termed *denial*. In contrast, *exaggeration* is a response style in which persons deliberately magnify their substance use or its effects. Of these, denial is the most common response style in substance use populations and adds an additional challenge to psychologists to obtain an accurate account of substance use. As noted in the *Results* section,

96.1% of those with positive cocaine urinalysis admitted to their cocaine use under confidential research conditions. However, this rate of agreement is relatively high when compared to other samples. In a community sample, Messina et al. (2000) found that nearly one-fourth those with a cocaine-positive urinalysis denied cocaine use. In comparison to Messina et al. (2000) and the current study, the rate of denial was dramatically higher in an adult sample from a walk-in clinic such that 72% of patients with cocaine-positive urine denied recent cocaine use (McNagny & Parker, 1992). These two studies differ from the current study in that neither one of these studies were assessing substance users in a treatment setting. This indicates that confidentiality and the lack of consequences was salient in substance users admitting to substance use. In real world settings, denial rates appear to be much more prominent.

Despite the prevalence of substance use denial, self-reports are a widely used technique for measuring drug use (Landry, Brochu, & Bergeron, 2003; Rosay et al., 2007). Furthermore, they are heavily relied upon. In many settings, these self-report measures are the predominant method used in planning and allocating drug prevention and rehabilitation services (Fendrich & Xu, 1994) as well as evaluating the effectiveness of such services in clinical settings (Falck et al., 1992). The criminal justice system relies upon these self-report measures as well. These measures are relied upon to determine which drug services should be offered to whom (Magura et al., 1987). Since substance use self-report measures have become key in forensic and non-forensic settings, research on the validity and clinical utility of these measures is critical.

Denial has been long recognized as a key issue in the substance use literature, but its complexity has largely been ignored. In the past, researchers have implicitly assumed that when substance users deny their use, they deny all aspects of substance use. The current findings

question this dichotomy and indicate that substance use denial should no longer be viewed categorically as a unidimensional concept.

As documented in the Introduction, the literature demonstrates that some drugs are denied more than others (Harrell, 1997; Harrison, 1997; Hser et al., 1999; Ledgerwood et al., 2008; Magura et al., 1987; Mieczkowski et al., 1991; Rosay et al., 2007). Specifically, drug use with more stigmatization and severe legal sanctions, have been found to have higher rates of denial (Harrell, 1997; Harrison, 1997; Hser et al., 1999; Magura et al., 1987). Generally, substance users more often deny “harder” drugs (e.g., cocaine and heroin) than “softer” drugs, such as marijuana.

The complexity of denial extends to other subtypes of denial. Two unexplored subtypes are denial of the amount of drug used and severity of the impairment. Substance users may admit to the use of a substance, but may deny how often and how much they have used. This becomes more problematic considering that most biological measures only detect the absence or presence of a substance, rather than the amount of drugs that have been used. Furthermore, substance users may admit to using drugs but may deny their impairment. Often, substance users think that their substance use is not affecting their decision making ability, which would also be impossible to detect though biological measures. Furthermore, psychological measures focus on substance use problems, rather than the amount used or severity of impairment and it is unclear if these subtypes would affect psychological measures.

The current study investigated *denial of effects*, a previously unexplored subtype of substance use denial. Denial of effects, also termed partial denial, is the denial of substance use interfering in multiple domains of a person’s functioning. When compared to complete denial and the honest condition, all measures showed that this type of denial is a distinctly different.

Partial deniers denied only certain aspects of their substance use on substance use measures. Importantly, most of the substance users who engaged in this type of substance use denial were also able to avoid detection on several self-reports substance use measures.

The denial of effects subtype is especially important because many of the substance dependency criteria used by the *DSM-IV-TR* (Diagnostic and Statistical Manual, 4th Edition, Text Revision) focus on the *effects* of substance use (American Psychiatric Association, 2000). Of the seven criteria for substance dependency, three can directly be affected by denial of effects. For instance, one criteria focuses on the impact of substance use across social, occupational, or recreational activities. Another consideration is that substance users are asked to be aware of the extent that substance use has affected them. For example, another substance dependence criteria relies upon substance users knowing the impact of their substance use and admitting to continued use despite these problems. With many criteria relying upon honest reporting from substance users, partial deniers can significantly hinder accurate classifications. Furthermore, partial denial can cause even more problems amongst substance abusers. All four criteria for substance abuse related to the *effects* of substance use. Since only one criteria is necessary for a substance abuse diagnosis (American Psychiatric Association, 2000), partial deniers can easily avoid this diagnosis.

An important consideration is that to receive a substance dependence diagnosis, the substance use has to lead to clinical significant impairment or distress (American Psychiatric Association, 2000). Substance users under the partial denial conditions will not qualify for a diagnosis if they can convince the mental health practitioner that their substance use does not cause them this level of impairment or distress. Therefore, clinicians working with substance users who are denying the effects may miss diagnoses.

Self-disclosing Substance Users

Substance users are notorious for denying or underreporting their substance use. Despite this knowledge, psychologists continue to rely upon highly face valid self-reports to assess drug use (Rosay et al., 2007). These measures ask direct questions about the frequency and drug related problems, such as the DAST (Skinner & Goldberg, 1986).

An important question is whether substance users are completely forthcoming when asked to self-disclose. Therefore, it is expected that the current sample should have scores above the recommended cut score on the DAST. Overall, the DAST was effective in identifying self-disclosing substance users (95.1%). Separating the two substance use disorders, the DAST was more effective with substance dependent individuals, identifying 96.9% of users. However, the DAST was less effective in classifying substance abuse individuals; only 4 of 6 (67.7%) of abusers scoring above the original cut scores (Skinner, 1982). Overall, the DAST was better able to detect substance dependent individuals because they tend to have more substance use related problems than substance abusers. This is expected since Taylor, James, Bobadilla, and Reeves (2008) found that the DAST was more accurate detecting substance dependence than substance abuse in a college population. Unfortunately, the current study and Taylor et al.'s (2008) study are the only two DAST studies that separately analyze substance dependence and substance abuse.

Another critical issue is how self disclosure affects the accuracy of clinical diagnoses. For substance abuse studies, utility estimates tend to emphasize sensitivity and specificity. Using clinical diagnoses as the gold standard, Cocco and Carey (1998) found a sensitivity rate of 74% and specificity rate of 83% in an outpatient sample, using the original cut scores (Skinner, 1982). This indicates that the DAST was better able to accurately rule out those without a substance use

disorder in this sample, than accurately identify those with these disorders. These results suggest 26% of individuals' lack of self disclosure and other factors affected the accuracy of diagnoses. The high level of specificity is expected since the non-users had nothing to deny.

The previous paragraphs have focused on the categorical utility of the DAST. However, the DAST can also be examined dimensionally to examine the severity of drug problems. On this point, Skinner (1982) noted that higher DAST scores imply lower functioning and a higher level of consequences. Using such criteria as social stability and stressful life events, Skinner (1982) demonstrated modest but significant correlations between the DAST and these broad indicators of maladjustment ($ds = .28$ to $.31$). In contrast, the current study focused on two very specific indicators: times in treatment and number of arrests. Using these more specific indicators, the correlations were slightly higher than what Skinner reported ($r = .37$ and $r = .34$, respectively). This difference could be a result of the different indicators of maladjustment used in the two studies. The number of times in substance use treatment and times arrested are more directly related to substance use consequences than social stability and stressful life events.

Another way to examine the clinical usefulness of the DAST is to compare the DAST to different domains of functioning using the DUSI-R. As previously noted, a strength of the DUSI-R is its assessment of substance use problems across nine domains. Every domain on the DUSI-R had a significantly, moderate positive correlation with DAST scores (see Appendix I). Of note, the relationship between peer relationships and work adjustment was especially strong, indicating that high DAST scores can provide a quantitative index of problems especially in these two domains. Furthermore, the highest correlation was related to other psychiatric symptomology.

The SASSI-3 adopted a set of complex decision rules utilizing different strategies to classify substance dependency. When examining the decision rules on the SASSI-3, they can be divided into three sections: face valid scales, subtle scales, and mixed scales. The face valid decision rules include the Face Valid Other Drug (FVOD) and Symptoms (SYM) scales. While the FVOD scale assesses for the acknowledged use of drugs, the SYM scale asks about the consequences, causes, and correlates of substance use in a face valid manner (Miller & Lazowski, 1999). The subtle scales include the Obvious Attributes (OAT) and Subtle Attributes (SAT) scales. Items on both the OAT and SAT scales were selected because they empirically discriminated between dependent and nondependent people; however, the SAT differs in that the items were selected which identified substance users *regardless* of whether they were responding under standard instructions or instructions to conceal evidence of substance abuse (Miller & Lazowski, 1999). As noted earlier, deception among substance users are often a concern for mental health professionals and the subtle scales were created to attempt to detect substance users even when they are denying their use. The last three mixed decision rules used a combination of scales, in which no discernable pattern can be identified. Appendix J includes more information about the SASSI-3 scales and cut scores established by Miller and Lazowski (1999).

The effects of self-disclosure were evaluated on the SASSI-3. As expected, self-disclosure played a key role in the effectiveness of the face valid scales. In fact, no self-disclosing substance user was detected by a decision rule that did not include either the FVOD or SYM scale. The decision rules that used the FVOD and SYM scales exclusively identified all but seven substance users (93.1%), while two of the mixed decisions rules that combined face valid and non-face valid scales detected five more substance users. To compare the effect of self

disclosure on other previous SASSI studies is difficult for two reasons. First, independent researchers have yet to find results and make conclusions similar to what is found by the authors of the SASSI manual. Second, although the SASSI is widely popular, the research on the measure evaluating the criterion and predictive validity is lacking (Svanum & Ehrmann, 1993).

The validation studies of the SASSI-3 found that both face valid and subtle scales are effective in detecting substance use in self disclosing individuals. These results are remarkably dissimilar to the results found in the current study. While the current study found no effectiveness in the subtle scales, the subtle scales detected 26.0% ($n = 175$) of the substance users that were not detected on the face valid scales (Miller & Lazowski, 1999).

The effectiveness of the subtle scales in the validation studies by Miller and Lazowski (1999) is an anomaly in the SASSI-3 literature. Independent research has continued to show that face valid scales are a better detector of substance use than the subtle scales (Gray, 2001; Laux, Salyers, & Kotova, 2005; Laux et al., 2005; Myerholtz & Rosenberg, 1997). For example, Clements (2002) examined the effectiveness of the face valid scales and subtle scales to assess substance dependents. Of those identified as substance dependent by the Composite International Diagnostic Interview– Substance Abuse Module (CIDI-SAM; Robins, Cottler, & Babor, 1995), the face valid scales detected the majority of the substance users (Clements, 2002). Myerholtz and Rosenberg (1997) found that the face valid scales alone were sufficient to classify 89% of substance dependent participants. Furthermore, the subtle and mixed decision rules did not accurately classify any substance users that were not detected with face valid scales. Both Clements (2002) and Myerholtz and Rosenberg (1997) suggest using the face valid scales alone, due to the relative ineffectiveness of the subtle items to identify substance users.

Only one independent study has claimed to find both the obvious and subtle scales of the SASSI effective in identifying substance users. In a university population, Cooper and Robinson (1987) found that the OAT scale was successful in discriminating non-users, moderate abusers, and severe abusers, when the cut score was decreased to six. Importantly, the SAT did not differentiate between the three groups. Overall, Cooper and Robinson (1987) found that the SASSI was successful in discriminating non-users, moderate abusers, and severe abusers, but the criterion to which the SASSI was compared was the Risk Prediction Scales (Morton, 1978). Interestingly, Myerholtz and Rosenberg (1997) report that the SASSI-3 face valid scales are based on the items on the Risk Prediction Scales developed by the Division of Addiction Services of Indiana. Therefore, the use of the Risk Prediction Scales for an external criterion does not provide an entirely *independent* criterion on which to compare the results of the SASSI.

Overall, face valid scales and measures showed more utility in detecting self-disclosing substance users. This was expected since individuals who were self-disclosing would indicate their use on questions obviously designed to assess for such use.

Partial and Complete Deniers

An important question is whether the face valid scales and measures will continue to be effective with substance use deniers. The current study examined the utility of self-report substance use measures with partial and complete substance use deniers.

As expected, the DAST was easily susceptible to denial, such that substance users in the partial and complete denial condition were able to significantly lower their scores. When considering the original cut scores of the DAST, 92.2% of those in the complete denial condition were able to score below the cut score and therefore successfully avoided detection. In fact, two-thirds of complete deniers did not answer one question on the DAST in the affirmative direction,

indicating that these individuals were able to obtain the lowest possible score on the DAST. Although not as strong but clearly convincing, two-thirds of partial deniers also avoided detection on the DAST (64.7%). Although researchers have assumed the DAST would be vulnerable to substance use denial (Yudko et al., 2007), the current study has been the only study to actually examine the DAST's susceptibility to denial. Skinner (1982) attempted to examine this issue, but used general denial scales to evaluate substance use denial. Skinner (1982) found that substance users with low DAST scores have high scores on the denial scale of the Basic Personality Inventory (BPI: Jackson, 1976) among voluntary treatment patients. Similarly, El-Bassel and his colleagues (1997) found that social desirability influenced DAST scores among an employment setting, indicating that these general defensive response styles can affect the DAST.

The SASSI-3 adds complexity in the detection of substance users by utilizing subtle scales to identify deniers. Conceptually, subtle items should be more effective in detecting deniers than face valid items. The current study produced results that are complete contrary to this theory. In fact, face valid scale decision rules (FVOD and SYM) detected more substance users than the subtle scale decision rules in both denial conditions. The subtle scales, whose items were selected for their ability to differentiate substance users from non-substance users, were not effective in identifying substance use deniers.

As an examination of the SASSI's ability to detect substance use deniers, Myerholtz and Rosenberg (1997) also administered the SASSI under "fake good" instructions. Of the previously detected substance dependent participants, 71.4% were able to go undetected under these instructions. Comparisons between substance users under standard and "fake-good" instructions

found that SAT scale did not differentiate between these two groups. However, the OAT scale differentiated between the two groups ($d = 1.74$).

In simulation design, the instructions given to the participants are vital. Rogers and Cruise (1998) established key components to simulation instructions. For example, Rogers and Cruise (1998) argue that the sample should have some familiarity with the context being simulated. The scenario instructions in Myerholtz and Rosenberg's (1997) study were vague and general, not specifying any specific context. Furthermore, Rogers and Cruise (1998) stress the importance of having instructions that are easy to understand and clearly communicate the intended message. The scenario instructions given in Myerholtz and Rosenberg's (1997) study are ambiguous and unclear. The instructions ask the user to minimize their problems related to substances in the first sentence; while the instructions continue on to ask the user to generally "look good." Given this combination, it is impossible to say whether the participants were engaged in general defensiveness or substance use denial.

Overall, the face valid scales on the SASSI-3 were the most effective in classifying deniers. Even though substance users have shown that they can easily avoid detection on face valid scales (through the analysis of the FVOD, SYM, and DAST), the current study showed that these face valid scales are more effective in the detection of substance users deniers than the subtle scales.

Further Analysis of Indirect Scales

The current study raises an important, but often over-looked, question; if the indirect scales are not detecting substance use deniers, what are they measuring? Substance use measures vary widely in their use of subtle items and the underlying strategies. For instance, the Polydrug Assessment Scale (Khavari & Douglass, 1978) is a subtle scale developed using items from the

MMPI. The basic strategy of this scale is to include items that focus on the attitudes and opinions of drugs to assess substance use rather than asking directly about using drugs. Another popular subtle scale strategy is using items that focus on behavior to assess for substance use.

A content analysis of the SASSI-3 subtle scales demonstrates that the subtle items appear to be assessing APD characteristics (Stein & Rogers, 2008). For example, several items on the OAT and SAT scales ask individuals about their criminal involvement and antisocial attitudes. Because of empirical keying, these items were not rationally selected based on their content. Nonetheless, the underlying logic appears to utilize social deviance, a common substrate of substance use. Substance users often engage in APD behaviors (e.g., lying, breaking laws, etc.). Not only is possession of these substances illegal, addiction often drives criminal behavior. Furthermore, the comorbidity between substance use and APD is common. The Epidemiological Catchment Area (Regier et al., 1990) study found that 83.6% of those diagnosed with APD also suffered from substance abuse or dependence. Interestingly, the current study found a higher rate of comorbidity than Regier et al. (1990) with 32.4% of substance users meeting criteria for APD. This discrepancy is likely due to the difference in settings: an inpatient treatment setting versus a community sample. Substance users who are in an inpatient treatment setting are likely experiencing criminal consequences motivating them to seek this intense treatment.

Personality characteristics have been widely cited to account for the variance between normal and problematic substance use. Specifically, individuals high in sensation and novelty seeking, social deviance, and behavioral disinhibition are more prone to drug dependence and are more likely to use a diverse range of substances (Chakroun, Johnson, & Swendsen, 2010; Conway, Kane, Ball, Poling, & Rounsaville, 2003; Conway, Swendsen, Rounsaville, & Merikangas, 2002; Franques et al., 2003). In fact, Chakroun and his colleagues (2010)

hypothesize that behavioral disinhibition is an etiological factor related to substance abuse and that behavioral disinhibition is a key component of polysubstance dependency. Of clinical importance, APD has been shown to be associated with poor outcomes among substance abuse patients (as reviewed by Chakroun et al., 2010).

Importantly, using antisocial characteristics as an indirect method to assess for substance use is not effective in forensic settings and can result in false positives. For instance, the adolescent version of the SASSI misclassified two thirds of non-using offenders as substance dependent (Rogers, Cashel, Johansen, Sewell, & Gonzalez, 1997). The problem with this strategy is the reliance on common characteristics to discriminate users and non-users. Rogers (2008a) warns that using common characteristics to classify individuals can cause erroneous classifications. Strategies should focus on distinguishing characteristics to obtain a more accurate classification across settings.

The use of APD characteristics to detect substance use relies upon substance users to endorse antisocial behaviors. The current study found that substance users denied these behaviors in the substance denial conditions, with the scores significantly lower ($p < .001$) than the honest scores with large effect sizes (Appendix G). For these subtle scales to work, the substance user would still need to admit to these antisocial behaviors and the current study demonstrated that substance users under denial conditions also denied antisocial behaviors.

Several assessment measures such as the MMPI-2 and MCMI-III appear to use this strategy of measuring antisocial behaviors to indirectly assess substance use, as discussed in the Introduction of this manuscript. To test this theory, the current study explored the relationship between APD characteristics and the subtle scales on the SASSI-3. After controlling for the severity of substance use, APD characteristics did not account for a significant amount of the

variance on the subtle item scales. This indicates that there is a relationship between the severity of substance use and APD characteristics.

Ward and Rothaus (1991) developed a multifaceted approach to assess for substance use denial that does not rely upon antisocial characteristics. The self-report measure includes two scales: the denial and rationalization scale. The Denial scale is to assess the degree to which they deny that their use is excessive and impairing, while the Rationalization scale assesses how much they rationalize their substance-influenced behavior. In contrast to the OAT and SAT scales, the items on the Denial scale directly address alcohol, such as “Alcohol controls my life.” Alcoholics who answer false to items on the Denial scale indicate that they are denying a substance use problem. Interestingly, these scales have only been used in a sample of substance users in rehabilitation and the Denial items were endorsed infrequently, indicating a low level of denial. More research would be needed to assess whether this approach would be more effective in other samples and with substance use deniers who also use drugs.

Subtypes of Substance Use Denial

Experienced clinicians cite denial as the most challenging treatment issue when working with substance users (Metzger, 1988). Conceptually, substance use denial has been previously viewed as a single, dichotomous response style, in which substance users were either described as denying their substance use or not. Clinicians working with this population understand that this dichotomy is too simple for the complexity of substance use assessment. On this point, Metzger (1988) has also stressed the importance of considering denial on a continuum from normal to pathological, defining pathological denial as maintaining a belief that others do not hold. Furthermore, he explained that the development of denial is a symptom of early-stage alcohol addiction and that when denial is evident, an addiction to substances is also occurring.

An important issue is the clinical presentation of partial deniers. An analysis of the SASSI-3 reveals several key differences between the two denial conditions across scales. While complete deniers tended to not endorse any items, a clear pattern in endorsed items emerged among partial deniers. On the FVOD scale, partial deniers were more willing to acknowledge using drugs to enhance their environment or feel better, using drugs and alcohol together, and spending time doing drug-related activities ($ds > 0.85$). When considering the partial denial scenario, it is important to consider that individuals were told that their boss knew they used drugs, but they were told it was necessary to show their boss that their use does not affect their work. Individuals in the partial denial condition may have endorsed items related to using drugs for enhancing parts of their life as a way to show their boss that they are only using drugs in certain situations and their drug use is not a global problem. It is important to note that even though partial deniers were more willing to acknowledge these items, the level of endorsement was still low with two-thirds of partial deniers still these denying items on the FVOD scale.

Partial deniers endorsed fewer items on the SYM scale than the FVOD. The items that were the most endorsed items had average score of less than 0.55 (out of 3). Partial deniers admitted more to items related to family substance use, excessive use, and an early substance history ($ds > 0.55$). The reason that partial deniers more readily endorsed these items on the SYM scale is surprising because these types of items indicated an increase in severity of substance use.

Differentiating patterns were also observed on the other face valid measure, the DAST. Partial deniers admitted to feeling guilty about their drug use, receiving help, receiving complaints from those around them about their drug use, and abusing prescription drugs. Since partial deniers knew that their boss was aware of their drug use, it seems likely that they felt that

admitting to feeling guilty and receiving help for the problem would show their boss that they regret their drug use and want to change their behavior. In fact, the one DAST question that asks whether the individual feels guilty about their drug use was the most endorsed item among the partial deniers on the DAST, with two out of three partial deniers endorsing the item. To compare, only 18% of complete deniers endorsed this item. Like the FVOD and SYM scale, these items best differentiated between the denial conditions, but still have a low level of acknowledgement with less than half of the partial deniers endorsing these items. Furthermore, their admittance of abusing prescription drugs might indicate that they believe that abuse of prescription drugs would be less stigmatizing and not necessarily admitting to any illegal activity. It seems that those in the partial denial condition used the strategy of admitting to substance use but showing their boss that it is not a problem by endorsing items that show remorse and are less stigmatizing.

Not surprising, a clear pattern did not emerge among the subtle scales on the SASSI-3 when examining partial deniers. In fact, no items on the SAT scale were successful at differentiating between the conditions ($d_s < 0.35$); the one item with the largest effect size ($d = 0.34$) asked individuals about their use of cigarettes. While smoking cigarettes is considered unhealthy, it is unclear why partial deniers would endorse the item more than complete deniers. The OAT did better, with one item showing a greater ability to differentiate between the two conditions, which asks about engaging in regretful behavior ($d = 0.75$), indicating that partial deniers may be more likely to endorse items that show their regret for their actions. In fact, most of these items were only endorsed less than 20% of the time among partial deniers.

General Defensiveness and Substance Use Denial

Several multi-scale and substance use measures utilize general defensiveness scales to assess for substance use denial. To examine this issue, a brief overview of defensiveness will be discussed. The relationship between general defensiveness and substance use denial will also be examined by comparing the current study's findings to the literature.

Underreporting psychological problems and defensiveness has long been an obstacle in psychological assessment. These response styles become more salient when assessing for potentially stigmatizing disorders, such as substance use. Often, the terms underreporting and defensiveness are often used interchangeably; however, an important distinction between the two terms involves intentionality. While the term 'underreporting' does not specify whether the attempt is intentional or not, defensiveness is defined as the *deliberate* denial or gross minimalization of physical and/or psychological symptoms (Rogers, 2008b).

Moving from general response styles, Paulhaus created a conceptual framework to understand underreporting. The Paulhaus' (1984) model of social desirability conceptualizes scales of underreporting (Greene, 2000) and placing emphasis on intentionality. Paulhaus distinguished socially desirable responding as two separate factors; self-deception and impression management. Self-deception occurs when the respondent genuinely believes his or her inaccurate self-reports, whereas impression management involves a strategic simulation, motive, or skill implying intent (Paulhaus, 1984).

Under Paulhaus' rubric, impression management is exemplified by the Lie scale on the MMPI. This scale was designed to measure general dishonesty rather than dishonesty about specific disorders. This type of scale implies that defensiveness is a global response style, which assumes that evidence of defensiveness in one area implies defensiveness across all symptoms or domains (Rogers, 2008a), even though there is no empirical evidence that this global style

occurs. Several multi-scale inventories utilize this approach by using general defensiveness scales to assess for substance use denial. This generalized approach implies that if an individual is being deceptive about everyday problems, then they are also being deceptive about substance use. Smart and Jarvis (1981) provided the first known insight into the disconnection between "drug" defensiveness and "general" defensiveness. While these two types of defensiveness can correlate, there is no empirical data that suggests that these two types of defensiveness always coincide with one another and substance users can engage in one, both, or neither forms of defensiveness.

Very few studies have focused on the utility of general defensiveness scales to assess for substance use denial. Only two studies have even assessed for the prevalence of general defensiveness in substance use populations. Among adolescent drug users, Winters, Stinchfield, Henly, and Schwartz (1991) found that drug using adolescents engaged in moderate levels general defensiveness. When compared to a control adolescent group, these substance users unexpectedly engaged in *lower* levels of defensiveness. In contrast, James, Lonczak, and Moore (1996) found that substance using adolescents engaged in both general defensiveness and substance use denial. Among the generally defensive, 57% of these adolescents admitted to substance use but denied problems as a result of this use. One explanation is that these adolescents were engaging in partial denial. While there is evidence of a relationship between substance use denial and general defensiveness, the nature of the relationship remains unclear. For instance, adolescents may have intentionally masked general as well as specific (e.g., substance abuse) problems.

The DUSI-R, used in the current study, includes the Lie scale, a general defensiveness scale. Researchers explain that individuals who exceed the cut score on this scale could possibly

have invalid results due to deliberate general deception (Dalla-Dea et al., 2003). The Lie scale is another example of using a general defensiveness scale to imply substance use denial; however, one study of Brazilian adolescents found significant negative correlations between Lie Scale scores and the reported use of alcohol, tobacco, cocaine, inhalants, tranquilizers, analgesics, and opiates (Dalla-Dea et al., 2003). This relationship was low, such that all correlations are ranged from -0.07 to -0.31, indicating no strong relationship between general defensiveness and the self disclosure of substance use.

An advantage of the current study is that the effectiveness of these general defensiveness scales can be analyzed under honest and substance use denial conditions. The current study found that partial and complete deniers had significantly elevated DUSI-R Lie scale scores when compared to their honest condition ($d = -2.11$ and -1.53 , respectively). This finding suggests that individuals in the denial conditions engaged in both substance use denial as well as general defensiveness. Even though the instructions did not encourage the substance users to engage in general defensiveness, participants may have attempted to generally “look good” because of the specific scenario that was work related.

In the current study, substance users who were instructed to deny their substance use had elevated scores on the general defensiveness scales. When considering the general defensiveness scale on the SASSI-3, Miller and Lazowski (1999) explain that the accurate classification of the measure decreases with elevated DEF scores (eight or more items endorsed). In other words, the SASSI-3, whose innovation included subtle scales to detect denied substance users, loses accuracy with those who engaged in moderate levels of general defensiveness. Interestingly even though Miller and Lazowski warn of the accuracy of the measure with elevated DEF scores, Decision Rule 8 and 9 include the DEF scale in combination with others, to classify individuals

as substance users. In fact, one part of Decision Rule 8 includes that the individual has to score eight or more on the DEF scale. It is unclear why the authors of the manual warn against using the measure with defensive individuals, but included a decision rule that relies upon an elevated DEF scale to classify an individual as a substance user.

The Impact of Substance Use Denial in Treatment

The concept of denial was reported by physicians as early as 1885 (Hackett & Cassem, 1974) and figures prominently in psychoanalytic theory (Freud, 1936). Denial is a complex construct that has been characterized in many different ways, such as dishonesty, interpersonal difficulties, brain injury, ego defense mechanism, and absence of education or poor motivation (Dare & Derigne, 2010).

Substance use denial is an important consideration in psychological assessment and treatment. In a popular treatment model, it constitutes a major component in the treatment of substance use (DiClemente, 2003). The Stages of Change model states that denial occurs during the precontemplation stage (Dare & Derigne, 2010). Substance users in this stage can be discouraged to change because of the various negative consequences that accompany substance use treatment (DiClemente, 2003). Substance users may be ambiguous or resistant to change. They can convince themselves that they are unable to change. Also, substance users have the tendency to rationalize their use. Short-term benefits often accompany substance use, such as mood enhancement or emotion avoidance, which makes it difficult to find motivation to quit.

Substance use denial also hinders users to seek treatment and fully engage in the treatment process. Substance use denial often has two levels: (a) it prevents users from fully understanding their problem so that they do not seek treatment and (b) once in treatment, it can hinder the treatment process by not allowing the user to receive treatment appropriate for the

severity of substance use. Using 1992 National Longitudinal Alcohol Epidemiological Survey, Grant (1997) found that the three most frequent reasons substance users fail to seek treatment were all differential expressions of denial of a problem. Even though each participant in Grant's sample met criteria for an alcohol use disorder, 85.9% never received treatment. Importantly, two other reasons were related to the social stigma associated with substance use. If substance use denial continues while in treatment, clinicians are not getting an accurate picture of the severity of substance use and may not address key issues that would assist the substance user in rehabilitation.

As a qualitative assessment, the current study asked the substance users during the debriefing how often and in what situations they have denied their substance use. Participants were asked if they engaged in denial of a certain drug, amount of use, impairment, or effects. The results showed an expected, but interesting outcome. Substance users were willing to admit to engaging in denial, such that nearly three out of four substance users admitted to engaging in some form of substance use denial (see Appendix K). Denial of the type of substance used was the most endorsed type of denial. Interestingly, the second highest reported denial was denial of effects, which highlights the importance of investigating this subtype of denial. The current sample also admitted to denying substance use mostly in work settings and in relationships with friends or family. However, half of the sample admitted to denial in romantic relationships and denying to avoid criminal consequences. These data imply that the sample was well-versed in denying their substance use and had done so regularly in their lives. Important to remember, the current sample voluntarily sought treatment. Even though the substance users admitted to denying their substance use in the past, the sample was currently in a treatment setting and may

have been more willing to admit to past instances of denial than substance users in non-treatment settings.

Although denial is often discussed as a problem, only a few authors have given guidelines to help minimize substance use denial. Sobell and Sobell (1995) offer several idealistic aims to assist researchers and clinicians to gain an accurate picture of substance use. Emphasis is placed on providing a safe, non-punitive environment in which the user feels safe to disclose their use. One way to provide this is to normalize and educate users about of substance use relapse. Another suggestion focuses on optimizing the interview. A more accurate depiction of substance use can be obtained through clear and thorough interview questions and ensuring the users is not under the influence at the time of questioning. Under these conditions, researchers have found that substance users are more accurate in their reporting of their use (Adesso et al., 2004).

Limitations

The participants included in the current study were all substance users from an inpatient dual diagnosis unit and included no control group of non-substance users. Because of this, utility estimates were unable to be calculated. A control group would have allowed a closer examination of the subtle scales on the SASSI-3. Since the subtle scales on the SASSI-3 do not address substance use specifically, it would have been interesting to see if the subtle scales produced any false positives in a non-using sample. A comparable inpatient control group would need to have similar demographics as the current sample.

The current study utilized a simulation design to assess the change in responses between the honest and experimental condition; therefore, the focus was on how the experimental condition changes the responses on the substance use measures. A fundamental key to simulation

design is manipulation checks (Rogers, 2008c). Manipulation checks are used to ensure that participants understood and adhered to their scenario instructions. Rogers (2008c) suggests that manipulation checks should ask individuals recall their instructions, assess comprehension, and report their compliance to the instructions. While the current study included a manipulation check after the experimental condition, the current study did not verify that participants were being straightforward in the honest condition, which could have provided an opportunity to exclude participants who might have been defensive under the honest condition. Furthermore, a more thorough lab validation would have also verified that participants were being forthcoming in the honest condition. Unfortunately, the participants' medical files were incomplete and there was not enough data to fully verify the participants' self report with urinalysis.

It has been well documented that the combination of both drug and alcohol use has physical and medical synergetic effects on the body, including more medical problems and higher mortality rates (Coffin et al., 2003; McCance-Katz, Kosten, & Jatlow, 1998). Furthermore, research has shown that the concurrent use of alcohol and drug use has serious psychosocial consequences as well. Concurrent use has been associated with mental health disorders and medical problems (Brady, Sonne, Randall, Adinoff, & Malcolm, 1995; Gossop, Manning, & Ridge, 2006). The focus of the current study was specifically on drug use, not alcohol use. Therefore, the current study does not account for the synergistic effects that could have influenced the results related to substance use consequences.

Future Directions

The current study explored a new subtype of substance use denial termed partial denial, or denial of effects. An examination of other subtypes of substance use denial is necessary to continue to understand the different facets of substance use denial. Therefore, examining denial

of amount or impairment could add to the literature on substance use denial. Using a simulation design, future studies should test the effectiveness of these measures when substance users are instructed to deny all, or parts, of their substance use.

Future research could examine whether the type of scenario affects how substance users deny their drug use. The current study used a job scenario and this scenario was likely the reason users denied more work-related consequences in the denial condition. The rationale behind using this scenario was that most individuals in the sample have likely had experience trying to get or maintain employment. Using scenarios involving family and friends might yield a different pattern of denied items. Important to simulation design, Rogers (2008c) explains for simulation design to be effective the scenario must include a few major elements. The scenario should be clear and the context should be familiar to the individual.

The SASSI-3 has perplexed many researchers because no independent studies have found that the SASSI-3 is as effective as the authors of the measure have found. The current study raised several questions about the effectiveness and underlying detection strategies of the subtle scales. The misuse of common characteristics (e.g., antisocial characteristics) to differentiate between substance users and non-users is a key issue that needs to be further examined. Of special interest, future studies should continue to examine the subtle items and their relationship to APD. Extending this study to include non-using APD individuals could answer more questions about the subtle scales. It is predicted that giving the SASSI in non-using forensic population would produce false positives.

The validation of substance use measures is predicated on the accurate measurement of external criterion. As noted throughout the *Discussion*, many research studies examining the accuracy of substance use measure fail to include external criterion on which to compare, instead

relying upon informant or non-standardized indicators of substance use. Stein and Rogers (2008) place emphasis on the use of treatment history, laboratory methods, and corroborated self-reports should be used as external criteria with simulation studies. While difficult to obtain in some settings, this combined method of validation can more accurately assess for dissimulation. Therefore, future studies should be sure to include external criteria to establish the measures' validity.

APPENDIX A
INFORMED CONSENT

University of North Texas Institutional Review Board

Informed Consent Form

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the purpose and benefits of the study and how it will be conducted.

Title of Study: Assessment of Response Styles in a Comorbid Clinical Population

Principal Investigator:

Chelsea Wooley, University of North Texas (UNT) Department of Psychology

Co-Investigator:

Richard Rogers, Ph.D., University of North Texas (UNT) Department of Psychology

Purpose of the Study:

- To study how substance users answer substance use measures.
- To study how role-played conditions affect how substance use is reported.

Study Procedures: You will be asked to participate in interviews and questionnaires related to substance use. Initially, participants will be asked to respond honestly to all questions. Next, the participants will be assigned to a scenario and will be asked to answer questions according to the scenario's directions. The study will take approximately 2 hours to complete.

Foreseeable Risks: The foreseeable risks are negligible. It is possible that you may find a few questions to be minimally distressful. Please let the researcher know if this happens. You will not be asked whether you have engaged in child abuse or elder abuse. If you volunteer such information, we are required by law to inform the authorities.

Benefits to the Subjects or Others: Participants may gain insight on the consequences of their substance use and how it affects them in many different areas of their life. The research is expected to demonstrate the usefulness of substance use measures when clients are not being accurate.

Compensation for Participants: Upon completion of both conditions, you will receive \$10 as compensation for your participation. No partial compensation will be provided.

Procedures for Maintaining Confidentiality of Research Records: Your information will be kept confidential and the data recorded without names or other identifiers. You agree that researchers can contact the clinical staff, if you pose a significant risk of suicide or self-harm. Your name will only appear on this consent form and a record of payment, which will both be filed separately from the rest of the study documents and will in no way be linked to your information. The participants will be de-identified by using participant numbers that cannot be traced to the participants' name. You agree that the researcher can access your file to gain only pertinent information related to the study. If you choose to participate in a second study named Impression Management and the Assessment of Personality Disorders, the information you

provide may be used in conjunction with the information you provide today. This combined data may be used for additional research.

Review for the Protection of Participants: This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). Contact the IRB at (940) 565-3940 if you have any questions about your rights as a research subject.

Questions about the Study:

If you have any questions about the study, you may contact Chelsea Wooley at the University of North Texas (UNT) Department of Psychology (940) 565-2671, or Richard Rogers, PhD at the University of North Texas (UNT) Department of Psychology (940) 565-2671.

Research Participants' Rights:

Your signature below indicates that you have read or have had read to you all of the above and that you confirm all of the following:

- I have read or have had read to me all of the above. A researcher has explained the study to me and answered my questions. I have been told the possible risks, discomforts and benefits of the study.
- I understand that I do not have to take part in this study. There are no consequences if I say “no” to the study. I do not have to answer any question. I can quit at any time. The researcher may choose to stop my participation at any time.
- In case problems or questions arise, I can phone Dr. Richard Rogers at the Department of Psychology, University of North Texas (940 565-2671).
- I understand my rights as research subject. I voluntarily consent to participate in this study. I understand the purpose of the study and how it is conducted. I have been told I will receive a copy of this consent form.
- I understand these records include drug/alcohol/mental health/communicable disease-related information. I understand that information released could contain reference to results of HIV antibody testing. A photocopy of this authorization should be considered as valid as the original. This consent is subject to revocation by the undersigned at any time, except to the extent that action has been taken in reliance hereon and in any event **shall expire within 90 (ninety) days** from the date of signature. The information being authorized to release is being disclosed to you from records protected by Federal confidentiality rules (42 CFR Part 2). A general authorization for the release of medical or other information is not sufficient for this purpose. The information to be released is **PRIVILEGED** and **CONFIDENTIAL** and is intended ONLY for research purposes.

Printed Name of Participant

Signature of Participant

Date

For the Principal Investigator or Designee:

I certify that I have reviewed the contents of this form with the subject signing above. I have explained the possible benefits and the potential risks and/or discomforts of the study. It is my opinion that the participant understood the explanation.

Signature of Principal Investigator or Designee

Date

APPENDIX B
DENIAL CONDITION INSTRUCTIONS

Complete Denial Scenario: Please think of how you would answer these questions if you were in this situation: You have been working at a job that you thoroughly enjoy and make pretty good money. The company decides to implement a Zero Tolerance Drug Policy, which states that any employee with known drug use will be fired immediately. You want to avoid being fired at all costs. The drug policy does not require a drug test of any kind, but it does require you to answer some questions regarding drug use. Importantly, the tests have questions that are designed to detect people who are denying drug use. Can you be successful in denying your drug use in a believable way? Please take a minute to think about how you will answer the questions to avoid any detection of drug use.

Denial of Effects Scenario: Please think of how you would answer these questions if you were in this situation: You have been working at a job that you thoroughly enjoy and make pretty good money. From a drug test, your boss knows that you use drugs and is concerned they may affect your work. If you deny all your drug use, your boss will know you are lying and you will be fired. Instead, you want to deny any effects the drugs have on your everyday life to keep your job. If your answers show any impairment you will be fired. Can you admit to drug use in a believable way but deny any harmful effects they have on your life? Please take a few minutes to think about how you would answer questions about your drug use so you appear to be well functioning in all areas of your life.

APPENDIX C
MANIPULATION CHECK/DEBRIEFING

Manipulation Check/Debriefing

- 1) What were your instructions? Check one:
 To deny substance use in a believable way
 To deny the effects the substances have on you

- 2) Did you follow your instructions? Check one:
 Yes No

- 3) How hard did you try to follow the instructions? Check one:
 I didn't really try, it's just a study
 I tried at the beginning but not so much at the end
 I tried most of the time
 I gave it a good try all the way through
 I tried my best all the way through

- 4) Do you think you were able to deny your drug use without getting caught by the test?
Check one:
 Yes No

- 5) What parts of your drug use did you deny **in the study**? (Check each one that applies to you)
Did you:
 Deny a certain drug you used?
 Deny the amount you used?
 Deny how impaired you were?
 Deny the effects it had on your life?

- 6) **In your life**, have you: (Check each one that applies to you)
 Deny a certain drug you used?
 If yes: How often? Once or Twice Occasionally Often
 Deny the amount you used?
 If yes: How often? Once or Twice Occasionally Often
 Denied how impaired you were?
 If yes: How often? Once or Twice Occasionally Often
 Denied the effects it had on your life?
 If yes: How often? Once or Twice Occasionally Often

- 7) Please check the situations where you denied your substance use **in your life**. (Check each one that applies to you)
 Work/occupational settings
 Friends/Family
 Romantic relationships
 To avoid criminal consequences
 Other, please specify: _____

APPENDIX D

SUBSTANCE USERS DETECTED BY THE DECISION RULES OF THE SASSI-3 ACROSS
CONDITIONS INCLUDING THE FVA SCALE

Decision Rule Scales ^a	Honest Condition			Partial Denial			Complete Denial		
	<i>n</i>	%	% ^b	<i>n</i>	%	% ^b	<i>n</i>	%	% ^b
FVA	40	39.2	39.2	9	17.6	17.6	3	5.9	5.9
FVOD	82	80.4	85.3	12	23.5	29.4	3	5.9	11.8
SYM	82	80.4	94.1	15	29.4	37.3	7	13.7	15.7
OAT	14	13.7	94.1	1	2.0	39.2	0	0.0	15.7
SAT	14	13.7	94.1	4	7.8	39.2	1	2.0	17.6
OAT & SAT	29	28.4	94.1	6	11.8	39.2	0	0.0	17.6
FVA or FVOD, & SAM	88	86.3	95.1	13	25.5	39.2	5	9.8	17.6
OAT & DEF & SAM	0	0.0	95.1	2	3.9	41.2	0	0.0	17.6
FVA or FVOD, & SAT & DEF & SAM	39	38.2	98.0	21	41.2	54.9	6	11.8	19.6

^a Scales that contribute to the decision rule

^b Cumulative percentage

APPENDIX E

DIFFERENCES BETWEEN THOSE DETECTED AND NOT DETECTED UNDER THE
DENIAL CONDITIONS ON THE SASSI-3

	Avoided Detection		Detected		<i>F</i>	<i>p</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Age	41.19	11.21	42.79	9.85	.532	.47	-0.15
Education	12.77	1.77	12.49	2.84	.370	.54	0.13
Number of times arrested	4.38	4.70	6.97	8.94	3.702	.06	-0.41
Number of times in substance use treatment	5.14	5.68	5.69	5.78	.214	.65	-0.10
DAST scores	12.69	4.54	14.05	2.88	2.76	.10	-0.35
Number of APD criteria	5.80	3.46	5.50	3.90	.159	.69	0.08

APPENDIX F
PERCENTAGE OF ENDORSED ITEMS ON THE DAST

DAST Items	Honest	Partial	Complete
	Condition	Denial	Denial
	<i>n=110</i>	<i>n=51</i>	<i>n=51</i>
	% ^a	% ^a	% ^a
1- Drug use	88.2	56.9	5.9
2- Abused prescription drugs	51.0	29.4	2.0
3- Use of multiple drugs	61.4	23.5	3.9
4- Have to use weekly	52.5	23.5	14.0
5- Inability to stop	75.5	23.5	12.2
6- Had blackouts or flashbacks	40.2	19.6	4.1
7- Felt guilty about use	90.1	62.7	18.4
8- Get complaints from others	80.4	41.2	12.0
9- Created problems in relationships	87.3	25.5	8.0
10- Lost friends	69.6	23.5	7.8
11- Neglected family	84.3	23.5	5.9
12- Work trouble	45.1	19.6	4.0
13- Lost a job	45.5	15.7	3.9
14- Gotten in fights under the influence	50.0	15.7	3.9
15- Illegal activities	58.4	21.6	3.9
16- Drug arrests	32.4	19.6	3.9
17- Withdrawal symptoms	78.4	24.0	5.9
18- Medical problems	58.8	21.6	7.8
19- Received help	89.2	37.3	10.0
20- Been in a treatment program	84.3	33.3	11.8

^a Percentage of participants who endorsed the item

APPENDIX G
COMPARING INDIVIDUALS ITEMS BETWEEN DENIAL CONDITIONS USING
COHEN'S D

	Complete Denial		Partial Denial		<i>F</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
SASSI-3 FVOD						
Item 10	0.18	0.56	1.16	0.16	13.91***	-2.72
Item 4	0.12	0.33	1.10	1.09	36.89***	-1.38
Item 11	0.22	0.58	1.04	1.07	22.72***	-0.99
Item 1	0.16	0.55	0.86	1.04	17.95***	-0.88
Item 3	0.06	0.32	0.57	0.85	15.26***	-0.87
Item 2	0.22	0.58	0.90	1.09	15.09***	-0.81
Item 14	0.14	0.50	0.75	1.11	12.05**	-0.76
Item 7	0.14	0.50	0.72	1.05	12.47**	-0.75
Item 6	0.18	0.63	0.78	1.01	13.04***	-0.73
Item 8	0.18	0.56	0.76	1.06	11.69**	-0.72
Item 12	0.27	0.73	0.86	1.11	9.98**	-0.64
Item 13	0.27	0.76	0.92	1.36	9.84**	-0.61
Item 9	0.14	0.53	0.57	1.06	6.51*	-0.54
Item 5	0.26	0.72	0.45	0.89	1.34	-0.24
SASSI-3 SYM						
Item 57	0.14	0.35	0.47	0.50	15.12***	-0.78
Item 56	0.14	0.35	0.43	0.50	11.89**	-0.68
Item 27	0.22	0.42	0.53	0.50	11.77**	-0.67
Item 42	0.18	0.39	0.43	0.50	8.32**	-0.56
Item 60	0.20	0.40	0.43	0.50	6.87*	-0.51
Item 59	0.22	0.42	0.34	0.48	1.95	-0.27
Item 55	0.18	0.39	0.27	0.45	1.40	-0.21
Item 54	0.20	0.40	0.27	0.45	0.86	-0.16
Item 58	0.20	0.40	0.25	0.44	0.50	-0.12
Item 35	0.18	0.39	0.22	0.42	0.24	-0.10
Item 40	0.35	0.48	0.31	0.47	0.17	0.08
SASSI-3 OAT						
Item 7	0.24	0.43	0.59	0.50	14.75***	-0.75
Item 11	0.31	0.47	0.58	0.50	7.65**	-0.56
Item 33	0.20	0.40	0.41	0.50	5.51*	-0.47
Item 23	0.18	0.39	0.28	0.45	1.53	-0.24
Item 39	0.20	0.40	0.30	0.46	1.32	-0.23
Item 20	0.18	0.39	0.27	0.45	1.40	-0.21
Item 48	0.37	0.49	0.47	0.50	1.00	-0.20
Item 19	0.25	0.44	0.33	0.48	0.75	-0.17
Item 4	0.27	0.45	0.33	0.48	0.41	-0.13
Item 17	0.10	0.30	0.14	0.35	0.37	-0.12
Item 53	0.14	0.35	0.18	0.39	0.29	-0.11
Item 52	.20	.40	.22	.42	0.06	-0.05
SASSI-3 SAT						
Item 49	0.39	0.49	0.56	0.50	2.88	-0.34
Item 18	0.06	0.24	0.16	0.37	2.56	-0.33
Item 61	0.14	0.35	0.25	0.44	2.24	-0.28

	Complete Denial		Partial Denial		<i>F</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Item 50	0.27	0.45	0.37	0.49	1.11	-0.21
Item 6	0.39	0.49	0.47	0.50	0.63	-0.16
Item 32	0.14	0.35	0.18	0.39	0.29	-0.11
Item 44	0.57	0.50	0.61	0.49	0.16	-0.08
Item 28	0.68	0.47	0.63	0.49	0.30	0.10
DAST						
Item 7	0.18	0.39	0.63	0.49	25.03***	-1.02
Item 2	0.02	0.14	0.29	0.46	16.61***	-0.90
Item 8	0.12	0.33	0.41	0.50	12.07**	-0.70
Item 19	0.10	0.30	0.37	0.49	11.31**	-0.68
Item 3	0.04	0.20	0.24	0.43	8.83**	-0.63
Item 15	0.04	0.20	0.22	0.42	7.53**	-0.58
Item 11	0.06	0.24	0.24	0.43	6.40*	-0.54
Item 17	0.06	0.24	0.24	0.43	6.87*	-0.54
Item 6	0.04	0.20	0.20	0.40	5.93*	-0.53
Item 12	0.04	0.20	0.20	0.40	6.11*	-0.53
Item 16	0.04	0.20	0.20	0.40	6.39*	-0.53
Item 20	0.12	0.33	0.33	0.48	7.13**	-0.52
Item 9	0.08	0.27	0.25	0.44	5.72*	-0.48
Item 10	0.08	0.27	0.24	0.43	4.69*	-0.46
Item 13	0.04	0.20	0.16	0.37	4.07*	-0.42
Item 14	0.04	0.20	0.16	0.37	4.07*	-0.42
Item 18	0.08	0.27	0.22	0.42	3.90	-0.41
Item 5	0.12	0.33	0.24	0.43	2.16	-0.32
Item 4	0.14	0.35	0.24	0.43	1.49	-0.26
Item 1	0.59	0.24	0.57	0.50	43.22***	0.05

Note. For significance, * $p < .05$; ** $p < .01$, *** $p < .001$.

APPENDIX H
DIFFERENCES ON THE DUSI-R SCALES BETWEEN HONEST AND DENIAL
CONDITIONS

	Honest Condition		Complete Denial		<i>F</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Substance Use	11.27	3.18	1.06	2.30	371.35	3.73
Behavior Pattern	10.25	4.25	2.57	3.53	119.66	1.97
Health Status	5.90	1.85	1.69	1.90	133.05	2.25
Psychiatric Disorder	12.14	3.48	2.10	3.75	296.86	2.78
Social Competence	6.65	3.26	2.55	2.87	54.03	1.34
Family System	8.28	2.77	2.18	3.13	144.13	2.07
Work Adjustment	4.55	2.63	0.78	1.63	92.39	1.77
Peer Relationship	9.59	2.99	2.27	3.53	175.10	2.25
Leisure Recreation	7.59	2.25	2.29	2.74	134.70	2.12
Lie Scale	1.71	1.53	6.16	2.69	125.47	-2.11

Note. All the ANOVAs were significant at the $p < .001$ level.

	Honest Condition		Partial Denial		<i>F</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Substance Use	11.39	2.49	3.59	4.39	109.36	2.27
Behavior Pattern	11.38	3.92	5.64	5.25	34.44	1.25
Health Status	6.22	1.54	3.12	2.38	82.45	1.58
Psychiatric Disorder	13.00	3.84	6.00	5.91	54.04	1.44
Social Competence	6.32	3.35	3.52	3.22	21.25	0.85
Family System	7.86	2.89	4.94	3.88	23.98	0.86
Work Adjustment	4.69	2.38	2.16	2.98	22.89	0.94
Peer Relationship	8.82	3.30	4.88	4.08	36.99	1.07
Leisure Recreation	7.84	2.24	5.04	3.53	28.80	0.97
Lie Scale	1.57	1.43	4.51	2.42	77.45	-1.53

Note. All the ANOVAs were significant at the $p < .001$ level.

APPENDIX I

CORRELATIONS BETWEEN DAST SCORES AND DUSI-R DOMAINS

	DAST Total Score
	<i>r</i>
DUSI-R Domains	
Substance Use	.35
Behavior Pattern	.34
Health Status	.31
Psychiatric Disorder	.47
Social Competence	.26
Family System	.36
Work Adjustment	.43
Peer Relationship	.45
Leisure/Recreation	.26

Note. All the correlations were significant at the $p < .01$ level.

APPENDIX J

A CLOSER LOOK AT THE DECISION RULES OF THE SASI-3

Decision Rule Scales^a

Decision Rule 1	$FVA \geq 18M/20F$ ^b
Decision Rule 2	$FVOD \geq 16M/21F$ ^b
Decision Rule 3	$SYM \geq 7$
Decision Rule 4	$OAT \geq 10$
Decision Rule 5	$SAT \geq 6$
Decision Rule 6	$OAT \geq 7$ & $SAT \geq 5$
Decision Rule 7	$FVA \geq 9$ or $FVOD \geq 15$, & $SAM \geq 8$
Decision Rule 8	$OAT \geq 5$ & $DEF \geq 8$ & $SAM \geq 8$
Decision Rule 9	$FVA \geq 8M/14F$ or $FVOD \geq 6M/8F$, & $SAT \geq 2$ & $DEF \geq 4$ & $SAM \geq 4$ ^b

^a Scales that contribute to each decision rule (Miller & Lazowski, 1999).

^b These decision rules use different cut scores for males (M) and females (F). Gender is indicated by M or F.

APPENDIX K
PERCENTAGE OF SUBSTANCE USERS WHO REPORTED PREVIOUS DENIAL OF
SUBSTANCE USE

	% Reported
<hr/>	
Types of Denial	
Denied a certain drug?	79.4
Denied the amount used?	73.5
Denied severity of impairment?	74.5
Denied effects it had on your life?	76.5
Settings where denial occurred	
Work/Occupation settings	66.7
Friends/Family	77.5
Romantic Relationships	52.0
To avoid criminal consequences	53.9
Other	6.9

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